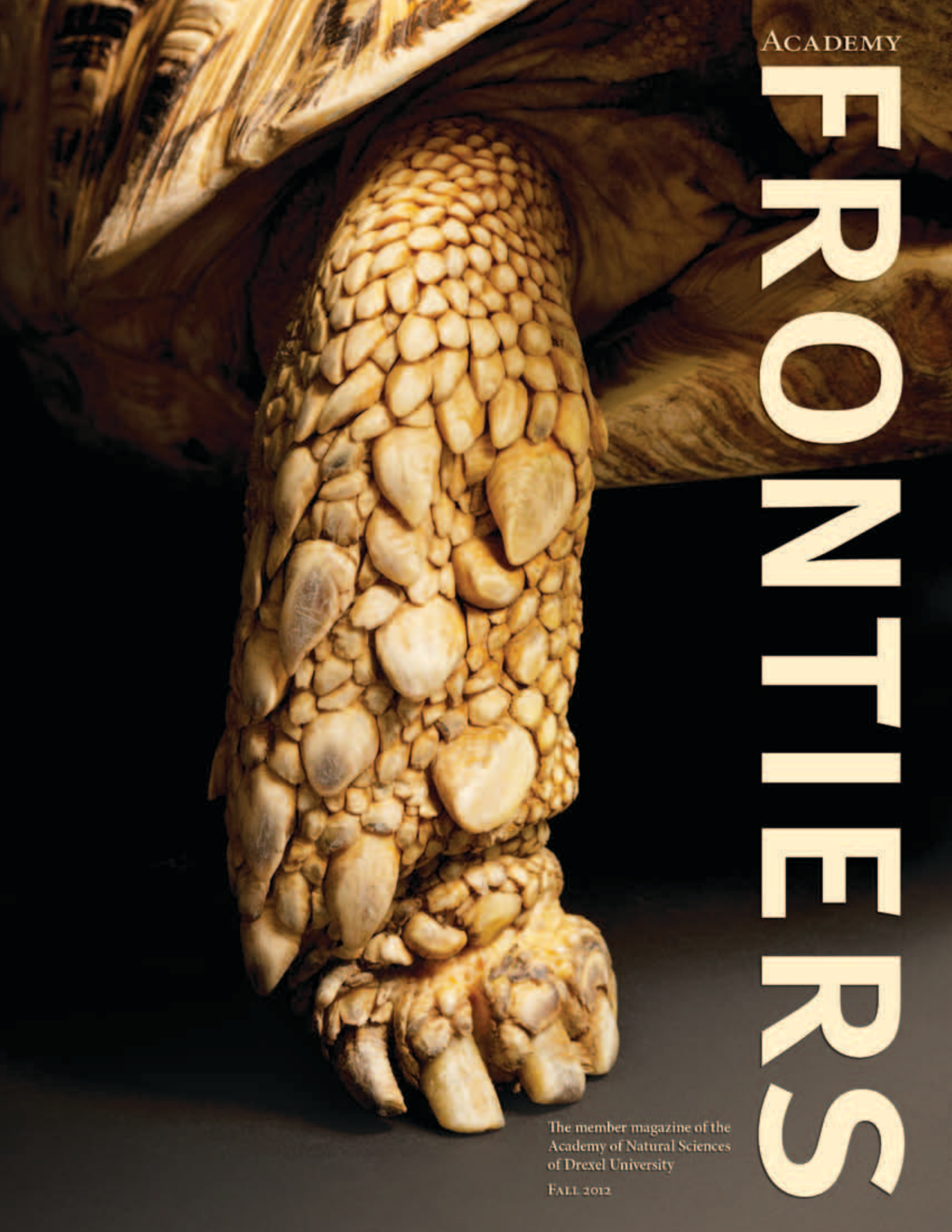

ACADEMY

FRONTIERS

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

FALL 2012

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Academy Frontiers is a quarterly publication of the Academy of Natural Sciences of Drexel University, 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 Academy 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: *Ollie the 36-pound northern leopard tortoise was donated to the Academy's Live Animal Center as an unwanted exotic pet more than 20 years ago. Unlike the water-dwelling, web-footed animals commonly referred to as turtles, land-dwelling tortoises have sturdy, stubby, round feet that they use for walking and digging. Read more about our live animals on pages 10 and 11. Photo by Paul Jamrogowicz (Drexel University).*

Greetings From the Academy

September 30 marked the one-year anniversary of the Academy's affiliation with Drexel University, a partnership that already has enhanced both institutions' work in many ways. Last winter, we collaborated with Drexel's technology team to launch a new and improved ansp.org. In the spring, students from Drexel's Westphal College of Media Arts & Design strengthened their practical skills assisting with the design of our *Flirtatious Feathers* exhibit and helping improve the Academy Shop and Café. University artists built sound and art installations, took photographs, and designed collateral materials.

In the upcoming months, our education and exhibits teams are working with Drexel to establish graduate programs in museum leadership and science education. With the Schools of Education and Public Health, we're also developing programs for families affected by autism. Drexel students are now engaged at the Academy, acquiring valuable career experience in departments ranging from accounting and communications to biogeochemistry and botany.

Perhaps the most significant outcome of our affiliation is the new Drexel department called Biodiversity, Earth and Environmental Science (BEES). The motto of the department, which boasts 13 Academy faculty and is chaired by Patrick Center Vice President Dr. David Velinsky, is "Field Experience, Early and Often." Echoing that mantra, the first BEES students began their coursework this fall with field trips to coastal, marsh, and terrestrial habitats.

In this issue of *Academy Frontiers*, you'll learn more about David Velinsky's vision for the BEES Department. You'll also get to know Dr. Katriina Ilves, an ichthyologist studying reef-fish communities, and our Live Animal Center staff who keep our animal ambassadors healthy, safe, and happy.

As the year comes to a close, I hope you'll consider supporting our 2012 annual fund. Every day, we advance biodiversity and environmental science and share our work with visitors, students, and you, our members. With your support, we can continue to build upon two centuries of exploration and discovery.

Enjoy *Academy Frontiers*, and we look forward to your next visit. Many thanks for your support!

All the best,

George W. Gephart, Jr.
President and CEO

Academy Frontiers

Fall 2012

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JOIN US FOR THESE UPCOMING EVENTS!

OCTOBER

Malacology Collection Behind-the-Scenes Tours
Thursdays through Mondays, 11 a.m. and 2 p.m., Ages 8 and up $

Tiny Tot Explorers
Wednesdays through November 14, 11 a.m. $ 📞

Urban Sustainability Forum:
Is Sustainable Agriculture Bad for the Planet?
Thursday, October 18, 6 p.m. M $

Philadelphia Shell Show and Festival
Saturday and Sunday, October 20 and 21, 10 a.m.–5 p.m. M

Plenty for the Planet: Sustainable Food and a Well-fed World with Anna Lappé
Sunday, October 21, 5:30 p.m. M $

Mega-Bad Movie Night: You Call It
Thursday, October 25, 6:30 p.m. $ 📞

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Live Animal Collection Behind-the-Scenes Tours
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Live Animal Discovery Weekend
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JANUARY

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Tuesday, January 15, 6 p.m. $ 📞

Botany Discovery Weekend
Saturday through Monday, January 19–21, 10 a.m.–5 p.m. M

M Free for members $ Fee 📞 Registration required

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

Visit ansp.org for more information and to register.

On Exhibit

The Academy at 200: The Nature of Discovery

Special Exhibits Gallery
Open through March 24, 2013

A toothy Freshwater Vampire Fish skull. A Burmese python. The 215-million-year-old jaw of an ancient crocodile-like reptile. Come face-to-face with these amazing specimens and more in a one-of-a-kind exhibit at the Academy. Experience science as you never have before by dressing up like a scientist, assembling a dinosaur skeleton in the bone lab, and learning about climate change. Step into our shoes (literally!) and experience your favorite natural history museum in a whole new way at *The Academy at 200: The Nature of Discovery!*

Greg Benson Photography

James Prosek

James Prosek: Ocean Fishes

Art of Science Gallery
October 13, 2012–January 21, 2013

Dubbed "the Audubon of the fishing world" by *The New York Times*, Connecticut artist James Prosek is known for his detailed and arresting watercolor paintings, which primarily feature fish and other ocean creatures. He showcases his personal impressions of marine beauties such as a 15-foot blue marlin through life-size paintings from his new book, *Ocean Fishes* (Rizzoli New York, October 2012). Through direct observation and imagination, Prosek reveals the subtle colors and forms of fishes often hidden from our view beneath the water's surface.

Drawn to Dinosaurs: Hadrosaurus foulkii

Art of Science Gallery
February 2–June 9, 2013

The Academy of Natural Sciences was the first in the world to create a mounted dinosaur skeleton for display, and to this day the Academy is known as "the dinosaur museum." *Drawn to Dinosaurs: Hadrosaurus foulkii* is an intimate exhibit that reveals the science and art of visualizing a living animal based on fragmentary fossils. The centerpiece is a full cast of the plant-eating duckbill dinosaur *Hadrosaurus foulkii*, discovered in 1858 in Haddonfield, N.J., by an Academy member and later reconstructed by the artist Benjamin Waterhouse Hawkins based on Academy research.

Katie Clark

DAVID VELINSKY: LEADING THE ACADEMY AND DREXEL INTO THE FUTURE

By Jen Zimmerman

Roger Thomas/ANSP

When Academy scientist Dr. David Velinsky was an aspiring oceanographer, he relied on fieldwork to prepare him for a life of scientific research. He jumped at the chance to gain invaluable experience in the natural world, staying in salt marshes overnight and going out on the ocean for weeks at a time.

Flash forward some years later, and Velinsky is now successfully juggling several leadership roles while balancing his own research. He acknowledges that those one-of-a-kind research opportunities shaped his outlook on his career.

"Those experiences got me really excited for a lifetime of this work," Velinsky says. "They're the sort of opportunities that keep people going in their fields of study."

They're also the sort of opportunities that Velinsky focuses on at the museum. As vice president of the Academy's Patrick Center for Environmental Research and leader of the biogeochemistry team, he oversees his fellow scientists' research and sets strategic and tactical goals for the Center and its staff.

This is no easy task. The Patrick Center's researchers comprise a multidisciplinary team—one which includes chemists, watershed and wetland specialists, a fisheries group, and scientists who study algae—and Velinsky is responsible for leading all of them.

Under his direction, these scientists study the impacts of drilling in northern Pennsylvania's Marcellus Shale region, investigate water quality in New Jersey's Barnegat Bay, and more. Armed with the philosophy that fieldwork "keeps people going," Velinsky's chief goal is "to facilitate the research that our staff can do … and help them expand their research potential."

While Velinsky's numerous leadership roles bring many challenges, they haven't held the Patrick Center director back. In July, he became chair of Drexel University's Department of Biodiversity, Earth and Environmental Science. A product of the Academy's new affiliation with Drexel, BEES includes 13 Academy scientists-turned-professors, the leader of whom will be Velinsky.

"With BEES, we're seeking to enhance the overall science connection between Drexel and the Academy," he explains. "Over time, I see BEES developing more of a research footprint at the university, expanding into new areas of biodiversity, ecology, and earth science."

But what about Velinsky's individual research? The scientist says he will continue to explore how freshwater and marine ecosystems transform over time by looking at changes in these environments' chemical and biological properties.

"At a young age, I always had a real passion for both the ocean and chemistry. As a 13, 14, 15 year old, I knew I wanted to be a chemical oceanographer," Velinsky explains. "Well, I didn't necessarily know what being a chemical oceanographer meant, but I knew I wanted to do it," he adds, laughing.

In the future, Velinsky will reach out to BEES students who share his enthusiasm for environmental science—a zeal that has continued to thrive with each new research opportunity. He's a testament to the fact that the new program's motto—"Field Experience, Early and Often"—is effective, and it seems more than likely that BEES scholars will gain meaningful hands-on experience in the field with Velinsky at the helm.

Academy Abbreviated

BEHIND-THE-SCENES TOURS AND MORE

Conrad Erb Photography

In celebration of its Bicentennial, the Academy is showcasing its collections through behind-the-scenes tours and discovery weekends. Throughout October, we'll highlight the Academy's Malacology Collection. See a sampling of our 10 million mollusk specimens on one of our behind-the-scenes tours, or join us for a returning favorite—the Philadelphia Shell Show and Festival—on October 20 and 21. See competitive shell displays, shop at our shell market, or make crafts of your own at the largest show of its kind in the Northeast.

In November, we bring you a living, breathing exhibit. We'll feature members of the Academy's live animal community of 100-plus creatures, including an endangered chinchilla, a friendly cockatoo, and a Vietnamese snake. You can see them in action during Live Animal Discovery Weekend from November 23 to 25.

In December, celebrate fishes of all colors, shapes, and sizes as we share our Ichthyology Collection. Encounter preserved Caribbean reef fishes during collection tours, or hear stories from real fish scientists on December 8 and 9, Fish Discovery Weekend.

Discovery weekends promise fun for the whole family, and behind-the-scenes tours (ages 8 and up) are Thursdays through Mondays during regular opening hours, except on festival weekends. Don't miss them—check page 3 for tour times. *~J.Z.*

THE PHILADELPHIA GEEK AWARDS

Billy McGinnis/ANSP

The coolest Philadelphia geeks packed the Academy with brains and style—and lots of fun and laughs—at the second annual Philadelphia Geek Awards on August 17. It was a sold-out, Academy Awards-style affair featuring eye-popping gowns, sky-high stilettos, and elegant tuxedos.

The Academy's Jill Sybesma organized the event alongside Geek Award creators Eric Smith and Tim Quirino of the popular blog Geekadelphia. Game developers, comic book writers, local filmmakers, journalists, visual artists, scientists, and others strolled the red carpet while cameras flashed.

After drinks, refreshments, and time to explore the museum, the crowd settled into the auditorium for the presentation. Even more guests watched a live stream in Dinosaur Hall. The podium shined with video animations to introduce the award categories. The award itself, a robot designed by Quirino and built by NextFab Studio using robotic lasers, was a big hit.

Awards were given in 14 categories, including Geek of the Year, Social Media Campaign of the Year, and Comic Book Writer of the Year. For the list, visit phillygeekawards.com. *~C.B.*

MALACOLOGY RECEIVES GRANT

Paul Callomon/ANSP

The Academy's Malacology Department recently received a significant grant from the National Science Foundation (NSF) that will allow it to digitize scientifically important specimens within its collection of 10 million preserved mollusks. July 2012 marked the beginning of the ongoing digitization process.

With the NSF funds, Academy scientists will be able to extend their resources across the globe. The specimens to be digitized, known as "types," were formerly accessible only through a visit to the museum, but with modern technology, these notable shells will be available for viewing worldwide.

Today, when a scientist discovers a new species, he or she chooses one specimen to be the "type." The specimen serves as a point of reference and, ideally, encompasses the animal's or plant's most defining features. Of the Academy's roughly 10 million preserved mollusks, about 100,000 are types.

With the NSF funds, our scientists will create high-resolution, true-color images of 12,000 type specimens and then upload these pictures to the Internet. This digitization process will aid researchers in the identification and conservation of mollusks, which have the highest proportion of endangered and extinct species of any group of organisms. *~J.Z.*

ANSP

HOLIDAY SHOPPING AT THE ACADEMY

Looking for some unique gifts this holiday season? The Academy Shop is the perfect place to find creative presents for the whole family. This year, you will see a new and improved space with brighter displays. The shop will feature your favorite standbys, dinosaurs galore, science stationery, jewelry, and cool exhibit-related merchandise. You will even find new items such as soft and cuddly plush animals just like those you see in our Live Animal Center. The Academy Shop is also the place to stop in through February to pick up your very own collection box.

With your membership, you receive 10 percent off your purchase in the Academy Shop and Academy Café, along with free admission to the museum and our special exhibits. Shop with us this season and bring a world of scientific discovery to your holiday celebrations! *~M.A.H.*

FINDING THE BLACK WALNUT

Anyone can be a naturalist. In each issue of *Academy Frontiers*, our scientists share their knowledge to help you explore the natural world. In this issue, we recommend a search for a tree that bears useful autumn fruits.

Mary Alice Hariook/ANSP

The eastern black walnut (*Juglans nigra*) is a native hardwood that grows primarily throughout the eastern and central United States and into southern Ontario. It can grow to more than 150 feet tall, but average trees are between 50 and 100 feet. The long trunk has dark, rough bark with narrow ridges. The pointed, green leaflets grow in pairs along a central stalk topped with a single leaflet, and they turn yellow and drop in the fall.

The black walnut provides shelter and food for many animals and serves as a resource for commercial products. Humans use the wood for fencing, firewood, gunstocks, fine furniture, veneers, and more. Edible nuts encased in the fruits provide flavoring in many baked goods, and nut husks have been used in making dyes for clothing, says Botany Collection Manager Alina Freire-Fierro.

You might recognize the black walnut's large (1.5 to 2.25 inches in diameter) fruit. The round, green outer husk surrounds a hard, corrugated shell composed of two halves, inside which is a small walnut. The fruits mature in September and October and then drop to the ground where the husks rot and blacken. You're likely to see a squirrel eating the fruits or burying them for safekeeping.

Thanks to frequent harvesting, black walnut trees may be more difficult to find than other trees in our area. They can prevent surrounding plant growth because they produce chemicals that are toxic to some other plants and spread these chemicals through their root systems, leaves, stems, fruits, and bark, explains Freire-Fierro. These trees also prefer full sun, so they tend to become the most dominant plants in their areas. Search for them in parks (including Fairmount Park), cemeteries, open woods, meadows, flood plains, areas near rivers or streams, or in your own backyard.

If you're lucky enough to collect a black walnut fruit, be careful. Your hands and clothes may be temporarily stained from the blackish-brown dye seeping from the husk!

Caribbean Reef Fishes, Then and Now

By Mary Alice Hartsock, Editor

More than 20 feet under the ocean's surface near Andros Island in the Bahamas, Dr. Katriina Ilves pauses to observe a coral reef teeming with marine life. The Academy's Chaplin postdoctoral scientist rarely stops to take it all in during a dive, but when she does, she's struck by her surroundings.

Large fishes swim above the undulating reef, radiant with its prismatic hues, and small fishes dart around sea fan corals and sponges below. Parrotfishes use their plate-like teeth to scrape algae off the coral structure that feeds and shelters them, creating an erratic crackling that counters the rhythmic bubbling of Ilves' breathing.

Buoyant in the water, Ilves snaps into action, scooping a rainbow of fishes into a hand net. Constantly attentive to her airflow, she must stay in sight of a fellow diver while she searches for fishes for the Academy's collection.

Ilves and her team emerge after an hour underwater. They quickly head ashore to identify and sort the collected fishes, tag and photograph them, take tissue samples, and preserve the fishes for future study.

It's a collaborative effort. For the Andros expedition, Ilves' team included ichthyologists

Photos by Andrea Quattrini

Carole Baldwin of the Smithsonian and Mark Westneat of Chicago's Field Museum; coral and fish experts Andrea Quattrini and Ron Eytan; and ichthyology affiliate Gordon Chaplin, whose connection to the project took root more than 60 years ago at the Academy.

Ilves' research builds upon that of Gordon Chaplin's father, Academy patron and reef-fish enthusiast Charles C.G. Chaplin, and Academy Ichthyology Curator Dr. James Böhlke. Beginning in the 1950s, they collected reef fishes all around the Bahamas, including near New Providence Island and Andros Island—the same areas where Ilves collected this year and during her 2010 trip to the region. With support from the National Geographic Society's Committee for Research and Exploration and private donations, she is comparing her data on fish diversity and relative abundance to the historical data to determine how these reef communities have changed over time.

"The collections help us understand what the reef community was like before the major onset of development and tourism in the Bahamas and before changes in temperature and ocean chemistry that may be connected to climate change," Ilves says.

Some coral reef habitats have changed drastically over the past five decades as development and tourism have expanded in the Bahamas. Coastal development as well as wastewater, fertilizer, and pesticide runoff have caused habitat degradation in reef areas close to human population centers. According to Ilves, these kinds of changes can affect reef food supplies and cause fierce competition for space on reefs.

Ilves found striking differences when comparing her 2010 data to Böhlke and Chaplin's data on reef-fish communities near New Providence, home to Nassau, the largest city in the Bahamas. Plant-eating fishes, particularly parrotfishes, were more prevalent in 2010 than during the historical time period—likely due to an increase in algae, their main food supply, which often thrives in polluted environments. Comparing the historical data to the 2010 data also indicated a relative increase in squirrelfishes, which spend their days inside the crevices of the reef, and a relative decrease in cardinalfishes, smaller fishes that inhabit this same area. Ilves posits that squirrelfishes may be stronger competitors for limited space in the now-degraded habitat.

"We want to see if there are the same kinds of changes around Andros, which is 30 miles away but the least inhabited island in the area," Ilves says. "Our hypothesis is that perhaps the reefs near Andros have remained in a more natural state than those around New Providence Island, and therefore what we'll find at Andros is that the communities today will more closely resemble communities of 50 years ago."

With the recent implementation of conservation efforts throughout the Caribbean, reef habitats could improve, Ilves hopes. Whether she returns to the region again for additional collecting depends upon future environmental and developmental changes in the region as well as the results from this year's fieldwork. As Ilves analyzes her data, her Academy connection strengthens her ability to draw conclusions about how reef-fish communities have changed over time.

"We have access to this long-term data set, which for marine systems is unbelievably rare," Ilves says. "It's great to be able to use those data to address questions about how fish communities respond to the degradation of their habitat and whether such ecosystem changes can be reversed."

SPOTLIGHT ON GENETICS

Through her 2010 and 2012 trips to the Caribbean, Dr. Katriina Ilves has added more than 4,000 fishes to the Academy's Ichthyology Collection and increased the size of the fish tissue collection by 50 percent. With Dr. Carole Baldwin of the Smithsonian, Ilves plans to use the tissue samples to examine the subtle genetic differences among reef-fish species found throughout the Caribbean.

The researchers will examine the fishes' DNA to find out how geography and climate events that shape geography may have affected genetic diversity. In particular, they will consider how a 6,000-foot-deep trench known as the Tongue of the Ocean, which separates Andros Island from New Providence Island, may have shaped the genetic makeups of certain fish populations in the area.

A LIVING EXHIBIT

By Mary Alice Hartsock, Editor

Have you heard of Benny the personable cockatoo? How about 11-foot-long anaconda Andy? What about Arnold the naughty raccoon or Sachindra the chattering myna bird?

If not, maybe you've heard of Rex the wallaby, who claimed fame in the 1960s by escaping his pen and hopping down Cherry Street. Or perhaps you'll recall Iris the porcupine, who wowed visitors in the 1970s by twirling to the William Tell Overture.

If you haven't guessed by now, these animals have been just a few of the stars of the Academy's Live Animal Center. Whether flying, slithering, crawling, hopping, or posing for the camera, these animals comprise a living, breathing exhibit that stands in sharp contrast to the preserved specimens that populate the corridors of the museum.

ANIMALS OF OUR HISTORY

The Academy's Live Animal Unit opened in the mid-1950s in a courtyard outside the museum. Prior to that, live animals were featured in special museum presentations. As the Center grew, students could watch animal-care demonstrations and view creatures such as Sheba the puma and Elmer the Brazilian monkey. Some smaller animals, including fishes, lizards, frogs, and a chinchilla, were displayed in a museum exhibit and starred in live animal shows.

In 1965, the Academy rehoused the animals in an updated Center in the museum's basement. That's where 1970s showman Roc the macaw hung out when he wasn't climbing light poles during live animal shows. It's also where a Burmese python hatched 27 eggs in 1985.

By the 1980s and 1990s, the Center was hosting smaller, more manageable creatures, many of which were unwanted exotic pets or injured animals unable to survive in the wild. Even with its novel accommodations, the Center was becoming crowded with its growing population. It was obvious to Senior Director of Education Jacquie Genovesi, who became head of the Center in 1994, that these small quarters impaired the animals' quality of life.

Genovesi worked with the Academy's Women's Committee to raise the funds needed to transfer the animals to a state-of-the-art facility in 1997. With a bird room, mammal room, reptile room, kitchen, quarantine room, and public viewing area, this new space offered plenty of room for roaming.

"We made the Live Animal Center something the Academy could be proud of," Genovesi says. "Now it's a resource for visitors, and it's a great training ground for people who want to care for animals."

Photos by Paul Jamrogowicz (Drexel University)

K.C. the great horned owl came to the Live Animal Center after being injured in 1997.

AMBASSADORS OF TODAY

The new Live Animal Center is where, for the past 15 years, Manager of Living Exhibits Laura McRae has spent a great deal of time sharing her skills with eager learners. With support from volunteers, an off-site vet, and Academy staff, McRae and full-time keepers Bar Carter and Leigh Lightner must address the needs and personalities of all the Center's inhabitants, from a turkey vulture with a 72-inch wingspan to a leopard gecko that weighs 0.1 pounds. They administer medications to elderly and sick animals, clean enclosures, groom and weigh animals, and craft balanced and specialized diets.

"We try to include as much variety as we can in the animals' diets," McRae explains. "For the parrots, the midday meal is fresh fruits and veggies, and we give them a bedtime snack. We rotate as many as 10 different vegetables throughout the week."

Keepers also develop tailored enrichment plans to keep the animals happy and healthy. One day, a parrot might enjoy special music, a bunny will play with new toys, or the raptors will soak up "rain" during a power wash of their enclosures. The rain encourages the birds to preen their feathers as they would in the wild, explains McRae.

These enrichment activities prepare the animals for the spotlight. With help from Academy teacher naturalists, the animals teach about endangered species, habitats, exotic pet challenges, city animals, and backyard creatures.

"Animals help people to connect emotionally," Genovesi says. "Research has proven that when you use an animal to communicate an educational message, people pay attention and retain information better."

If you catch a live animal show or visit during November 2012, you'll meet animals such as Tokala the fox, chinchillas Pocono and Pierce, and K.C. the great horned owl. Visit during Live Animal Discovery Weekend (November 23–25) to meet a keeper and see animal training in action. Throughout November, visitors ages 8 and up can take behind-the-scenes tours of the Live Animal Center.

A DAY IN THE LIFE

Ollie the 36-pound northern leopard tortoise has been at the Academy for 20 years—longer than her keeper, Bar Carter. Ollie snoozes in the morning, waking up to relax in the spray of the hose the keepers use to clean other animals' enclosures. When Carter cleans the green iguana enclosure, Ollie, who roams freely in the Center, sits behind the door and traps Carter inside—just for fun, of course! If Ollie smells lunch, she walks around until it's her turn, almost always getting underfoot. She eats throughout the afternoon, returning to her bowl when she's not basking under a warm light.

Ollie is the love interest of our male tortoise, Kobe, who follows Ollie all day, biting the back of her shell or knocking into her with his shell. She tolerates him, but she is more interested in the attention she receives from museum visitors. Stop by our children's discovery center, *Outside In*, every Wednesday to see Ollie and her friends!

EXTRAORDINARY SEA CREATURES IN GLASS

By Sarah M. Kemp and Clare Flemming

Leopold Blaschka (1822–1895) and Rudolph Blaschka (1857–1939), the father-and-son team of extraordinary glassworkers, may be best known for their legacy of more than 800 glass flowers on permanent display at Harvard's Museum of Comparative Zoology. But that collection was just the swansong in the Dresden-based Blaschkas' career, which began with glass eyes for taxidermy mounts, expanded to accurate models of marine and other animals, and spanned seven decades. Working from the most accurate scientific texts of the time, the Blaschkas created marine invertebrates, including delicate octopi, ethereal jellies, and flowering anemones.

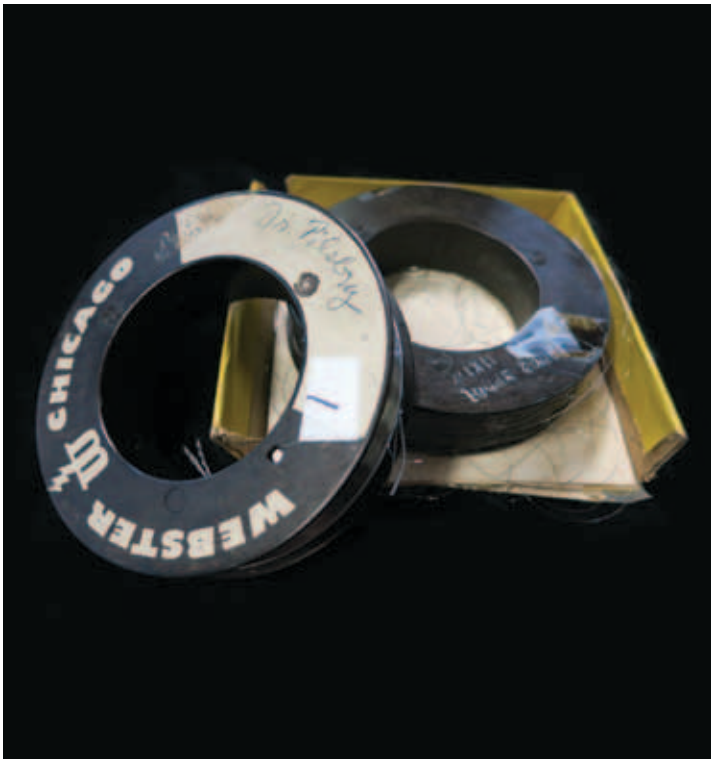
The Academy's preeminent naturalist Joseph Leidy stated his admiration of the scientific usefulness of these works in the 1879 issue of *Proceedings of the Academy of Natural Sciences* (31, 2: 209). He wrote that the Blaschka models are, "remarkable for their accuracy and beauty … They represent soft and delicate forms which cannot be satisfactorily preserved, and others too minute to be examined with the naked eye. Moreover, their price is so moderate, that it is to be hoped that the Academy may make early provision to obtain a series." The Academy purchased these models in 1879 through Ward's Natural Science Establishment in Rochester, New York, which sold Blaschka models by catalog to schools and museums.

Today, many of our glass models are mounted on the original boards made by Academy staff when the models were acquired. Some labels are marked with the names of other original owners who gave models to the Academy. One still features the original Ward's catalog label with its distinctive printed orange circle around the text. Plus, the Library holds an original Ward's catalog (1878), likely the very one handled by Leidy.

This spring, the Archives, in cooperation with the Malacology and Exhibits Departments, collated and inventoried the collection, which totals nearly 50 glass models of marine invertebrates that were previously dispersed throughout the Academy. Word travels fast in scholarly circles; this summer we hosted Blaschka experts from London, Vienna, and Philadelphia, all equally impressed with our collection.

The collection is revealed and featured in a new Library display, *Art of the Abyss* (below), and you can see it weekdays at 3:15 p.m. With original bases, antique handwritten labels, and supports still intact, our Blaschka models are remarkable not only for their beauty, but also for their history.

Mary Alice Hartsock/ANSP



Mary Alice Hartsock/ANSP

It may be hard to imagine, but these reels of thin wire are audio recordings from the 1950s. Wire recordings were the predecessor of magnetic audio tape and enjoyed a heyday of use in the 1940s and 50s. A typical reel like the ones pictured ran 7,200 feet and represents about an hour of recording. These wires hold a lecture given by the Academy's long-serving malacologist Henry Augustus Pilsbry (1862–1957) on the history of zoological nomenclature (the scientific naming of animals). They were revealed when a researcher encountered them in a collection of Pilsbry's papers.

How can this antique medium be valuable to us today? Digitization, of course. With support from the Malacology Department's Friends of Mollusks fund, the Academy Archives sent the recordings to an audio company that carefully played them on the appropriate vintage device, recorded them digitally, and returned the digital version on a tiny USB drive along with the original wires. Now you can take in Pilsbry's lecture on the scientific naming of mollusks as his deliberate voice emerges from the crackling, decades-old recording. *~Clare Flemming, M.S, C.A., Interim Director of the Library and Archives and Brooke Dolan Archivist*

Sustainability Matters

"THE FIRST LAW OF ECOLOGY"

By Roland Wall, Director of the Center for Environmental Policy

In his 1971 book *The Closing Circle*, ecologist and author Barry Commoner posed four informal "laws of ecology." Perhaps the most fundamental of these laws was the first: "Everything is connected to everything else."

When Commoner was writing 40 years ago, policymakers attributed pollution to specific point sources, or identifiable causes, such as factory emissions, wastewater discharges, and oil tanker spills, addressing these problems with narrow solutions and regulations.

Commoner's idea that "everything is connected to everything else" challenged the world to think beyond narrowly defined problems and solutions and to consider these issues in light of our complex and interconnected ecosystem.

Today when we think about sustainability, we contemplate the connections between natural and human systems. For example, humans interact extensively with natural systems through food and agriculture, so the food supply of urban neighborhoods must be considered in the context of an extended urban ecosystem.

Food, water, land use, health care, and waste disposal are just a few of the critical life support systems that relate humans to the planet's ecosystem. We are covering several of these issues in upcoming Center for Environmental Policy programs.

On November 8, consumer activist and nutritionist Marion Nestle will share her assessment of current food politics, and on January 15, biologist and environmental advocate Sandra Steingraber will discuss the relationship of waterborne toxins to human health. Save the dates!

SEYMOUR S. PRESTON III: ADVANCING EDUCATION AT THE ACADEMY

For Seymour S. Preston III, it all started in 10th grade. A successful student at Swarthmore High School, Preston took his entrance exams to the prestigious Lawrenceville School in Lawrenceville, New Jersey. He passed, but the director of admissions recommended that Preston begin his course of study in the Third Form, equivalent to the 10th grade coursework he had finished at Swarthmore High.

At first, Preston was discouraged, but by the time Christmas vacation arrived, he knew starting anew was "the best thing that ever happened" to him.

"I learned how to study, I was doing well academically, and I was participating in extracurricular activities," Preston remembers. "I learned what a really good education could mean, and I've been conscious of that ever since."

In the first year at Lawrenceville, Preston developed the interest in chemistry that prepared him for a college degree in the field and a distinguished career in the chemical industry. It was during this time that he found out that "learning new things in the right way" can change lives. He believes this fact holds true for the young women in the Academy's Women In Natural Sciences (WINS) program, which provides science education and personal enrichment opportunities to high school women, particularly those from economically disadvantaged families and schools.

That's why Preston and his wife Jean are members of the Academy's Jefferson Circle of Giving, which plays a critical role in supporting the Academy's mission. The couple also has named the Academy in their estate plans, becoming members of the 1812 Society this year. By establishing a legacy at the Academy, they hope their contributions will support the institution's education initiatives for many years to come.

"Education is the thing the Academy is really great at," Preston says. "97 percent of the girls that come into the WINS program and stay four years end up going to college, and that's fabulous.

"These kids come from incredibly difficult backgrounds, and they are getting an opportunity to get a start on an education that will really mean something to them," he says.

Preston has sought others with interests in education, bringing a number of contributors to the Academy by sharing information about WINS and other educational programs. He also commends the Academy's Center for Environmental Policy programs, including the Town Square. His personal investment in education has prompted him to serve for more than 30 years as an Academy board member, including five years as board chair.

Alicia Preston Miller

During his time on the board, Preston has served on the finance and nominating committees, and he was part of the search committee that selected current president George W. Gephart, Jr. Under Preston's leadership, the Academy gained support for the Ruth Patrick Chair in Environmental Science, an endowment that supports innovative environmental research by an Academy scientist. Requesting this support was easy, he says, considering his admiration of Dr. Patrick's contributions to ecosystem studies.

Preston has gone above and beyond to uphold the Academy's role as a community educator, acting as interim president from 2000–2002. During that time, he helped to reshape the institution's development department and assisted the Academy in achieving greater financial stability. In 2006, Preston was honored with the Academy's Maclure Award, which recognized his many years of discovery, vision, and philanthropy.

Preston continues to serve on the Academy's board, and his financial contributions remind us of his intense commitment to education, one that has been relevant throughout his life.

"I hope my contributions will continue to support various education opportunities within the Academy," he says. "Education is a big deal in my mind." *~Mary Alice Hartsock*

SIMPLE WAYS TO SUPPORT THE ACADEMY

Did you know there are a variety of ways to support the Academy of Natural Sciences of Drexel University? Here are a few options that will allow you to help sustain your favorite natural history museum.

RETIREMENT PLANS

When you name the Academy as a beneficiary of your IRA, 401(k), or other qualified retirement plan, you can avoid the double taxation your retirement savings would face if you designated these funds to your heirs. You will continue to take regular lifetime withdrawals, and you'll have the flexibility to change beneficiaries if your family's needs change during your lifetime.

LIFE INSURANCE

Make a significant gift using an asset that you and your family no longer need. If you transfer ownership of a paid-up life insurance policy to the Academy, we may elect to cash in the policy now or hold it. Either way, you will receive an income tax deduction. In some cases, you can use the cash value of your policy to fund a life-income gift, such as a deferred gift annuity.

REAL ESTATE

If you deed your home, your vacation home, undeveloped property, or a commercial building to the Academy, you will receive an income tax deduction for the fair market value of the real estate. You'll pay no capital gains tax on the transfer, and you can direct the proceeds from your gift to a specific program at the Academy.

PERSONAL PROPERTY

If you transfer antiques, a valuable painting, or other personal property to the Academy, you'll receive an immediate income tax deduction for the appraised value of your gift and pay no capital gains tax (as long as the gift can be used by the Academy to carry out its mission). In certain cases, you can use personal property to fund a life-income gift that provides you and/or other loved ones with an income now and that benefits the Academy in the future.

Explore the possibilities! There are many ways you can make a gift that is immediately beneficial to the Academy. For more information, call Amy Marvin, vice president of Institutional Advancement, at 215-299-1013, or email her at marvin@ansp.org.

Academy Support

On behalf of the Academy's Board of Trustees, we wish to recognize and thank those who have contributed to the Academy between **June 1** and **August 31, 2012**. Your generosity helps to fund the Academy's many programs of research and education, and we are tremendously grateful for your support.

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Mike Servedio/ANSP

Exhibit Designer Lauren Duguid touches up the Opossum diorama during the 5th Annual Members' Night on September 14.

Academy Support

Mike Servedio/ANSP

A young visitor practices her skills handling forceps with a specimen of Amphiprion ocellaris, *the fish that was the inspiration for the star character in* Finding Nemo.

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Mike Servedio/ANSP

Ichthyology Collection Manager Dr. Mark Sabaj Pérez helps visitors match fish specimens with their cinematic counterparts.

Snapshots

IN THE FIELD

Roger Thomas/ANSP

This summer, Academy scientists measured water quality between Trenton, New Jersey, and Wilmington, Delaware, on the tidal Delaware River by studying processes that affect oxygen levels in the water. This photograph shows part of the process as staff scientist Will Whalon obtains sediment from the Delaware's floor. By examining the sediment's contents—specifically, the level of organic matter and plant material it contains—scientists can determine how much oxygen is available for animals and bacteria to consume in the water. This shows the important linkage between the bottom of the river and the quality of the water above it. The more oxygen, the better! With sufficient oxygen levels, quality of life for aquatic animals improves, and fish migrating up and down the estuary are more abundant.

Patrick Center Vice President Dr. David Velinsky says that this area of the Delaware historically has had low levels of oxygen, although pollution controls have lessened the problem in recent years. When work on the Delaware concludes next year, Velinsky says, the researchers will advise Delaware resource managers on strategies to improve water quality in the future. *~J.Z.*

BEHIND THE SCENES

Mike Servedio/ANSP

In this photograph, Academy live animal specialists prepare to move an *Olios* spider into an enclosure for our August 2012 special exhibit, *Nature's Assassins*. This exhibit featured venomous, scary-looking invertebrates, including tarantulas, centipedes, and scorpions.

According to live invertebrate specialist Karen Verderame (right), this spider and several other invertebrates were difficult to transport into their new habitats even though she and her team members are experts in moving live animals. Several species were extremely fast movers, and others could jump sideways, diagonally, backward, or forward. Luckily Verderame and the team's quick and efficient work allowed them to move 21 invertebrates into their new enclosures without a hitch! *~M.A.H.*

JUST FOR KIDS

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

PHOTO CHALLENGE

Can you spot four differences between these two photos of shell specimens from the Academy's Malacology Collection? Circle your guesses, find the answers below, and visit us during the Philadelphia Shell Show and Festival on October 20 and 21 to see even more cool shells, make crafts, and more!

DID YOU KNOW...?

Despite how they look in the movies, velociraptors are actually pretty small! On average, these extinct dinosaurs were only about three feet in height, which is as tall as a modern-day turkey.

—Amanda Torres, Drexel Education Intern

Do you have a question about the natural world?

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

PHOTO CHALLENGE ANSWER KEY: In the second photograph, an additional shell has been added to the cowries in the collection manager's hands; the Venus comb in the bottom left corner is missing; a label has been added in front of the nautilus shell; and the collection manager's left thumbnail has been painted pink.

COLOR A VELOCIRAPTOR

We know how dinosaurs were shaped based on their skeletons, but we still aren't sure about the colors of their scaly skins. Some scientists even think the dino below had feathers! Have fun coloring this speedy, meat-eating velociraptor the way you think it looked, feathers or not!

Jason Poole/ANSP

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