

ACADEMY

INSIDE:
Winter bird-watching

FRONTIERS



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Academy of Natural Sciences
of Drexel University

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ON THE COVER: Many bird-watchers search for the golden-crowned kinglet (*Regulus satrapa*) in our area each winter. With its tiny round body and narrow tail, the male golden-crowned kinglet has short olive and black wings and an orange and yellow patch bordered in black on its crown. The female typically has a yellow crown and shares the male's gray and olive body. © Rob Curtis/VIREO

ACADEMY GREETINGS



Dear Friends,

In September, we learned with great sadness of the passing of Dr. Ruth Patrick at the age of 105. Throughout her long and distinguished career at the Academy of Natural Sciences, which began in 1934, Dr. Patrick pioneered the study of freshwater and the organisms that depend on it. She positively affected quality of life for both humans and wildlife by providing policymakers with accurate information about the environment and the benefits derived from its protection.

Dr. Patrick mentored generations of young scientists and served as a remarkable role model for women eager to establish professional careers in the natural sciences. Many Academy employees knew her well, naming her as a friend and adviser alike. These scientists and staff, one of whom you will meet on page 14, have succeeded largely because Dr. Patrick helped them turn their passion for the natural world into useful, productive careers that truly make a difference.

Dr. Patrick inspired many people in the scientific community, but she got her start at home as many of us do today. As a young girl, she accompanied her father and sister on collecting excursions into the woods near her home in Kansas City, Missouri. Without role models to guide her, would young Ruth have gone forth to conduct pioneering environmental science research? We will never know for sure, but we do know that children are more likely to develop a passion for science when they receive encouragement from adults they admire.

Every day, Academy scientists and educators inspire curiosity and excitement in individuals of all ages through their work behind the scenes and in the museum. As a member, you have the ability to share this unique, accessible museum environment with the children in your life. The Academy's commitment to sharing our discoveries with the public makes it possible for your family to access cutting-edge research and exhibits, such as *Dinosaurs Unearthed*, in your city's natural history museum. Turn to page 8 for a guide to winter exploration outside the museum.

Thank you for your ongoing support of the Academy. Your enthusiasm is the source of my inspiration—and I can't wait to see you in the museum this winter.

All the best,

A handwritten signature in black ink, appearing to read 'Gephart'.

George W. Gephart, Jr.
President and CEO

FOUNDED IN 1812, THE ACADEMY OF NATURAL SCIENCES OF DREXEL UNIVERSITY is a leading natural history museum dedicated to advancing research, education, and public engagement in biodiversity and environmental science.

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For bird-watchers, winter brings rare sightings.



The purple finch (Haemorhous purpureus) is irruptive, at times moving in large numbers south of its breeding range in northern North American forests when the conifer crop is small. The adult male purple finch has a streaked back and notched tail and is rosy red on its body, head, and rump; the female is brown where the male is red and has more streaking on its belly. Find the purple finch at the edges of forests, in suburbs, and in parks in our area, or attract it to your yard with a feeder full of sunflower seeds.

Dinosaurs Unearthed



Dinosaurs Unearthed

SPECIAL EXHIBITS GALLERY
THROUGH MARCH 30

Roaring, moving, life-size animatronic dinosaurs invade the Academy of Natural Sciences of Drexel University for a multi-sensory experience for the whole family. State of the art and scientifically accurate—down to the feathers on *T. rex*—*Dinosaurs Unearthed* features more than a dozen realistic dinosaurs, as well as skeletons, fossil casts of skulls, claws and horns, real specimens of mosasaur and *Spinosaurus* teeth, an *Oviraptor* egg, and the ever-popular coprolite (dino poop). A dig site for young paleontologists, chances to control dinosaur movement, and other activities encourage exciting hands-on exploration. Fee: \$3 for members and groups; \$5 in addition to museum admission for nonmembers.

International Orchid Show & Sale

SPECIAL EXHIBITS GALLERY
APRIL 11–13

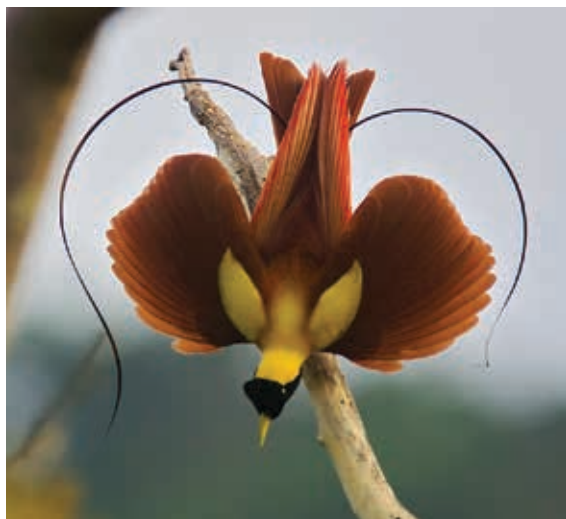
Mark your calendars for a flower-filled weekend! In April, the International Orchid Show will once again transform the Academy of Natural Sciences of Drexel University into a spectacular world of orchids. See thousands of orchids from all over the globe, and purchase plants from vendors from as far away as California, Ecuador, Brazil, Japan, Malaysia, and Taiwan. Whether you're a novice or an expert, learn valuable botanical information from expert growers and exhibitors.

The International Orchid Show is presented in collaboration with the Southeastern Pennsylvania Orchid Society (sepos.org). For more information call 215-299-1000 or visit ansp.org/orchidshow.



Greg Allikas

Tim Laman



Birds of Paradise

SPECIAL EXHIBITS GALLERY
MAY 3–SEPTEMBER 1

Lace up your dancing shoes for a journey to the remote rainforests of New Guinea, land of the exotic birds-of-paradise. An elegant example of extreme evolution, birds-of-paradise show off their feathery flair during elaborate mating rituals. In this special exhibit based on the groundbreaking research of photographer Tim Laman and Cornell ornithologist Edwin Scholes, visitors will behold the birds' cinematic courtship dances, puffed-out plumage, wild calls, and wacky behaviors through video, photography, soundscapes, and displays on research and conservation. Specimens, illustrations, and the chance to learn signature bird moves in a unique dance-off make this attraction fun for the whole family.

Birds of Paradise has been codeveloped by:





MARY BAILEY: TEACHER, TRAVELER, DINOSAUR GROUPIE

By Mary Alice Hartsock

THE OFFICES OF ACADEMY STAFF ARE TUCKED INTO CORNERS AND CUBBIES ALL OVER THE MUSEUM, and Mary Bailey’s is no exception. Nestled behind the polar bear diorama in a literal closet filled floor to ceiling with lighting equipment, Bailey’s workspace is without windows, and her neighbor is the Academy’s taxidermy moose. Yet she would argue that her office sits atop prime real estate, because the door opposite the dioramas leads directly into the Special Exhibits Gallery.

When she’s in her office—which isn’t very often—she listens as school groups chant “All hail the moose!” as they visit the famous diorama, and she hears children squeal as the polar bear chows down on an unlucky seal. Lately, she’s been listening to a lot of roaring and shouting from *Dinosaurs Unearthed*, on display in the Special Exhibits Gallery through March 30, 2014. She logs most of her time among the bellowing animatronics, guiding members and visitors, answering questions, and gawking at the dinosaurs, which she thinks

make up one of the most exciting and immersive displays she has ever seen.

And she’s seen lots. After obtaining a bachelor’s degree in archaeology, art history, and anthropology, she taught in Korea and Thailand. Since then she has traveled widely—her most memorable experience was receiving a traumatic bullet and bite during a trek through the Amazon rainforest in Ecuador. She has been in love with nature since she read *50 Simple Things Kids Can Do to Save the Earth* at age 8. *Dinosaurs Unearthed*, she says, enables you to walk through the world of dinosaurs “on your own terms” as you access some of science’s most cutting-edge technology and recent research.

Bailey thinks guests will be surprised to figure out how much they are learning as they have a blast exploring the exhibit. As an informal educator with a master’s in museum education, she is drawn toward the kind of free-form learning that museum exhibits offer. By observing exhibit visitors and evaluating their interactions with the

displays, she identifies the best ways to approach them with new information.

“There’s no such thing as common knowledge,” she says. “Every guest has a different background and different perspective—even guests in the same group. And every interaction has a teachable moment.”

Bailey is learning as much from this exhibit as our visitors. She spent the days prior to the exhibit’s arrival reading and absorbing as much information as possible to supplement her dinosaur knowledge. She is an avid bird-watcher in her free time, and she views this exhibit as an opportunity to learn even more about them through observing their prehistoric relatives.

Bailey loves the fact that *Dinosaurs Unearthed* is bringing nature—and a group of extinct animals—within the Academy’s walls where they’ll be accessible to people all over the region. If she can’t be outside exploring nature for herself all day every day, bringing the wild world indoors will do just fine. 🌀

AIMEE TURNER EXPERIENCED WHAT SHE BELIEVES WILL BE ONE OF THE MAJOR HIGHLIGHTS OF HER FIRST YEAR OF COLLEGE BEFORE HER INITIAL QUARTER AT DREXEL UNIVERSITY OFFICIALLY BEGAN. During a pre-term trip to the Barnegat Bay Field Station in Ocean Township, New Jersey, she and her future classmates came face to face with an Atlantic green sea turtle (*Chelonia mydas*), which the United States Fish and Wildlife Service lists as a threatened species.

The students accidentally captured the sea turtle while seining for fish in Barnegat Bay. They released the turtle unharmed after snapping a few photographs. For these students entering Drexel’s Department of Biodiversity, Earth and Environmental Science (BEES), catching a glimpse of a rare animal is exactly the kind of experience they were hoping for when they chose Drexel.

The students grew up amidst reports of changing weather patterns and countless accounts of natural disasters. They recognize that BEES will prepare them to investigate climate change, biodiversity, and the environmental consequences of human activities. A product of the affiliation of the Academy of Natural Sciences and Drexel, BEES provides students with a comprehensive understanding of the environment through interdisciplinary scientific education and research. Courses and fieldwork teach students how to classify and study the planet’s organisms and ecosystems and their natural relationships, and how to assess human impacts on the environment. The department is offering undergraduate majors in environmental science, environmental studies, and geoscience, as well as master’s and doctoral degrees, through Drexel’s College of Arts and Sciences.

Turner was thrilled that the opening act of college included wading through a marsh, collecting plants in the Pine Barrens, and seining the bay to sample for crabs and fish side by side with real scientists. She has now made connections with students who share her interests—individuals who will explore, protect, and preserve the natural world through careers in the sciences, environmental consulting, and advocacy. 🌊



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Rich Horwitz/ANS

NOT YOUR ORDINARY FINCH

Anyone can be a naturalist. In each issue of *Academy Frontiers*, our scientists and staff share their knowledge to help you explore the natural world. In this issue, Ornithology Collection Manager Nate Rice helps us track down a nomadic bird that visits our area during the winter.

The common redpoll (*Carduelis flammea*) is a type of finch that appears in Pennsylvania, New Jersey, and Delaware only during the winter. With a distinctive bright red cap, or “poll,” on its forehead, the redpoll has brown and white streaked feathers, a white belly, white wingbars, a short, pointy, dark yellow beak, and a black chin. The adult male redpoll also boasts light red plumage on its breast, sometimes extending into its face. These colors may be slightly duller in winter. An adult redpoll is around 5 inches long and has a wingspan greater than 8 inches—similar to a goldfinch or a small sparrow.

The common redpoll travels in a flock, spending its summers in arctic environments foraging for seeds in weeds, brush, conifer forests, and small trees. Unlike traditional migrants, many of which journey south in winter to specific warm climates rich in fruits and insects to eat, the common redpoll travels to a variety of locations. The redpoll moves when its food supply declines or is threatened by extremely harsh weather conditions. Some years this bird moves a great distance if food supply is low in its normal winter range. Lucky for those of us who live near Philadelphia, extreme weather in Canada or New England may improve our chances to spot the common redpoll in our backyards.

Rice recommends that you try visiting Fairmount Park in January and early February to catch a glimpse of a visiting redpoll, especially if northern weather is inclement. Arrive by sunrise, and remain very still to hear and observe the day’s first bird calls. Look closely at any finch flocks near scrubby habitats, birch trees, and willow trees—the common redpoll

may be among other types of birds. A startled finch is unlikely to return to a threatening area, so if you spot one, be very quiet and move slowly.

Try drawing redpolls to your backyard, balcony, or fire escape by making your own finch feeder. Place it near shrubs or bushes if you can, and then be sure to stay more than 10 feet away from the bird feeder—even if you are indoors—so the birds feel safe. Only refill your bird feeder at night when birds have gone to roost. 🐦


MAKE A FINCH FEEDER

You will need:

- One old stocking or pair of panty hose
- Two chopsticks, wooden skewers, or wooden dowels
- String
- Scissors
- Thistle seeds

Fill the toe of a stocking with about two cups of thistle seed, which you can purchase at any pet store. Tie the stocking off with string, and cut it off about a foot above the seed ball. Holding the bag very still, have an adult puncture the seed pouch with skewers, running the skewers across the pouch through to the other side of the bag. The skewers should be perpendicular to each other. Then make a series of tiny snags or runs through which the birds can grab seed. Use your string to hang the pouch from a sturdy tree branch!





When the air becomes crisp and snow begins to fall, the natural world can seem still and silent. Yet experienced bird-watchers always keep their binoculars handy, for winter provides the perfect setting to catch a glimpse of some extraordinary birds.

By Mary Alice Hartsock, Editor
Photographs by Glenn Bartley,
Johann Schumacher, and Tom Vezo,
courtesy of Visual Resources for Ornithology

Winged Vagabonds



The white-breasted nuthatch (Sitta carolinensis) has grayish-blue feathers on its back, a white face, a long, pointed bill, a white upper-belly, and reddish-brown feathers on its lower belly. A black “hood” runs from its neck to the top of its head. In winter, you may see this bird foraging in flocks with chickadees and titmice. It’s likely to be creeping along tree trunks and large branches of deciduous trees, turning sideways or upside down as it searches for seeds, nuts, and insects. You may also spot this common feeder bird in the woods and in parks, wooded suburbs, and yards where large trees grow. © Glenn Bartley/VIREO

MOST OF US KNOW THAT MANY BIRDS FLY SOUTH FOR THE WINTER OR RETREAT TO LOWER ELEVATIONS WHERE FOOD IS PLENTIFUL. Some birds simply are more likely to migrate because their ancestors did, while others must migrate to survive. For this latter group, warmer destinations provide food, such as berries and insects, which are in short supply during a cold northern winter. Unfortunately, a number of migrants never reach their safe havens as a result of predators, overexertion, extreme weight loss, starvation, collisions, challenging weather, and a variety of other dangers encountered during their journeys.


The dangers of migration may be part of the reason that certain birds do not leave their habitats during inclement weather. Blue jays, which migrate only occasionally, mourning doves, crows, cardinals, and others forage for food throughout the winter.

Not all birds have such predictable cold-weather behavior. Unlike migratory birds, which travel from one specific site to another every year, irruptive migrants travel abruptly to a variety of sites when their regular cuisine is scarce. As winter seed-eaters that are not solely dependent upon berries and insects, they are able to find food in many different areas year-round. Scientists

are still working to determine the triggers of winter bird irruptions. While some point to harsh weather and its effects on food availability, others credit food supply alone.

Bird-watchers look forward to winter in Pennsylvania, Delaware, and New Jersey because it is the perfect time to spot birds that do not normally live in our area. These experts know what settings and types of vegetation attract rare birds, and they have the ability to identify them based on their plumage, behaviors, and calls.

If you are not an experienced bird-watcher, we hope the following images, descriptions, and tips will help you discover and photograph the winter birds in your neighborhood with nearly as much skill as a seasoned birder.

All photographs are from the Academy's Visual Resources for Ornithology (VIREO) collection, the Academy's worldwide bird photography collection, which includes images of 7,300 species of birds. Seven hundred photographers and ornithologists have contributed to the collection. VIREO photographs are widely used in publications, exhibits, apps, and educational lectures. You can see 93,000 photos of birds, including all of the North American species, at vireo.ansp.org. View a gallery of the winter birds of Philadelphia at vireo.ansp.org/winterbirds. 

BIRD-WATCHING TIP

Many birds associate skyward movements with predators. That means that you may frighten a bird if you stand up from a seated position or abruptly lift your binoculars. To avoid disturbing the bird, remain still. Raise your binoculars or camera to your face very, very slowly, pulling your arms up against your torso. ~Nate Rice, *Ornithology Collection Manager*

White-throated Sparrow

A sharply outlined, bright white throat is the defining feature of the white-throated sparrow (*Zonotrichia albicollis*). This large bird has dark stripes on its crown, a white over-eye stripe, a bright yellow spot between its eye and pointy gray bill, a rusty-brown back, and a grayish belly. You might spot it scratching in undergrowth, brush, and gardens, where it eats weed seeds and small fruit directly off plants. The white-throated sparrow is one of the most common sparrows in our area in winter.





American Goldfinch

(Above) The American goldfinch (*Carduelis tristis*) adult male in breeding plumage is bright yellow with a black forehead, jet black wings with white bars, and a black and white tail. The adult female and winter male are grayish brown and white. From pink conical bill to notched tail, this bird measures up to 13 cm. It forages locally, sometimes with redpolls (p. 7), during the winter. It is most likely to be found in old fields, open woodlands, and along highways, especially where thistle and sunflower seeds are plentiful.

Fox Sparrow

(Below) Growing up to 18 centimeters, this large, plump, round sparrow (*Passerella iliaca*) has a short bill, reddish-brown back, rump, and tail, reddish wings, a grayish head, and an underside splotched with brown. It is found in undergrowth, searching for seeds under leaf litter yet avoiding deep snow. See if you can spot a fox sparrow foraging in a backyard thicket this winter.

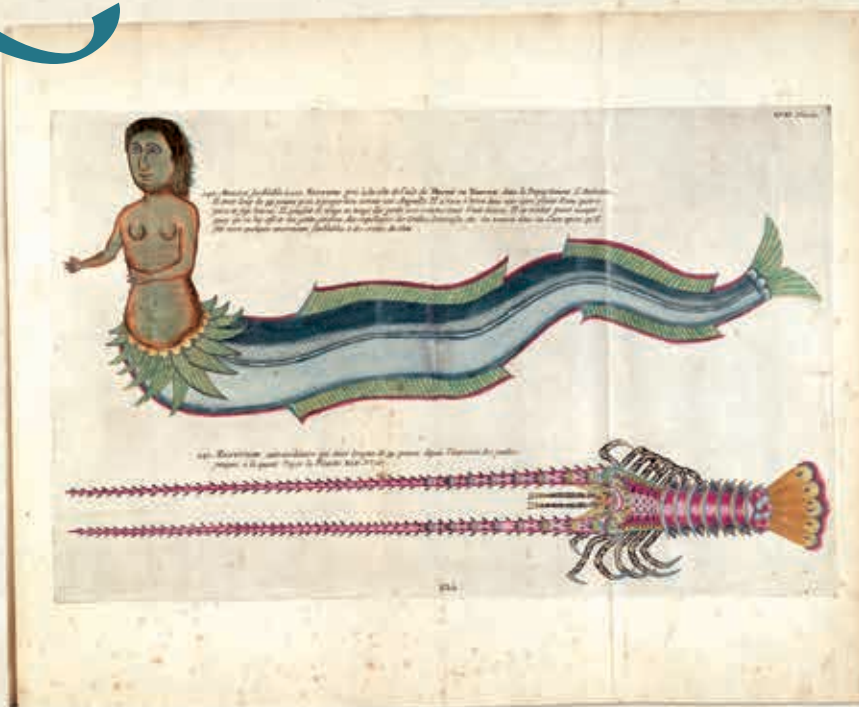
VIREO'S TOP 10 TIPS FOR BIRD PHOTOGRAPHY

- Keep the sun at your back. Side lighting and backlighting rarely work well for birds.
- For most situations, use the longest lens you have.
- Use a tripod whenever possible.
- Know your birds. Try to anticipate where a bird will be, and set up before it arrives.
- On sunny days, shoot photographs early and late in the day.
- Pay attention to the background—usually simple is best.
- For flight shots, pan the camera following the movement of the bird.
- Avoid shadows and lighting with intense contrast.
- Think about composition while shooting. Don't place the bird in the center of every frame.
- Shoot for action and behavior; don't just settle for portraits.

~ Doug Wechsler, Director, Visual Resources for Ornithology



Q: WHY ARE THERE ILLUSTRATIONS OF MYTHOLOGICAL CREATURES, INCLUDING MERMAIDS, IN SCIENTIFIC WORKS?



ANS Library QL616.R3

A: On January 9, 1493, six months after setting sail for the “New World,” Christopher Columbus reported seeing three mermaids off the coast of the Dominican Republic. He described them as “not half as beautiful as they are painted.”

What Columbus actually saw were likely manatees.

More than 200 years later, myths gave way to scientific reason as 18th- and 19th-century naturalists and explorers discovered and classified more and more plants and animals. Creatures of legend and lore were soon replaced by legitimate and equally extraordinary species documented by hard scientific facts, physical specimens, and direct observation. Mermaids were discovered to be manatees and dugongs (large marine mammals), unicorn horns were actually narwhal tusks, and the remains of dragons were reclassified as those of dinosaurs.

Although today we know them to be mythical, we can appreciate representations of fantastical creatures in early scientific literature for their aesthetic, cultural, and historical significance. They are examples of a bygone era in which we perceived and understood the world around us to be a place

where dragons ruled the skies, unicorns roamed the forests, and mermaids swam the seas.

Pictured here is one of the most well-known depictions of the mermaid in all of natural history, that of the “Sirene” of Ambon, from Louis Renard’s *Histoire Naturelle des plus Rares Curiositez de la Mer des Indes*, first published in 1719. Featuring 460 hand-colored copper engravings by Samuel Fallours, an artist in the employ of the Dutch East India Company, the illustrations feature species of marine life from the East Indies, including 415 fishes, 41 crustaceans, two stick insects, a dugong, and a mermaid. Beautiful to behold and popular in its day, Renard’s work would later be dismissed by 19th-century naturalists for its surreal exaggerations.

Whether you think mermaids reality, or mere fantasy, one thing is true: the myth of the mermaid remains one of humankind’s most enduring fascinations and stands to this day as a complex symbol of the majesty, mystery, and monstrosity of the ocean itself. ~Brandon Zimmerman, *Harrison Expedition Researcher & Photograph Technician*

What have you always wondered about the Academy’s history?

Please send your questions to ans_editor@drexel.edu, and we in the Academy Library and Archives will comb through our collections and respond to an intriguing question in the next issue.

MAKING YOUR HOME ENERGY EFFICIENT

Reviewed by Scott Kelly (Re-vision Architecture) and Andrew Kleeman (Energy Coordinating Agency)

DID YOU KNOW THAT IMPROVING THE ENERGY EFFICIENCY OF YOUR HOME MAY BENEFIT YOUR WALLET, YOUR WELL-BEING, AND THE ENVIRONMENT? If your home is cold or dim, you may need to use extra heat and light to remain comfortable. Your body may even require extra energy to stay warm, leaving you feeling sluggish or tired and decreasing your productivity. You can compensate by turning up the heat, but you may be doing that at the expense of the environment.

In the United States, the carbon footprint of our buildings is larger than that of our transportation systems, says Andrew Kleeman of the Energy Coordinating Agency,

an organization committed to helping people conserve energy and promote a sustainable and socially equitable energy future in the Philadelphia region. In other words, the buildings where we work and play emit more greenhouse gases than cars, trucks, and trains. With a little homework, you will uncover simple and inexpensive fixes that will help you make a difference—and reduce your home’s energy budget.

It’s far better for the environment to make improvements to your existing house than to start over with a new home, says Scott Kelly of Re-vision Architecture, a firm that specializes in restoring the balance between natural and human-built environments. We must be diligent about double checking that windows and doors are closed tightly and locked, which can

create a strong seal against outside air, he says. Windows and doors that remain drafty can be sealed quickly with regular or rope caulk purchased at any home improvement store. Installing storm windows can also help to protect against cold air seepage all season long.

A great first step to finding out about what areas of your home need attention is a Building Performance Institute (BPI) certified energy audit, which can determine your home’s overall energy performance, Kleeman says. In addition to conducting safety testing around gas-powered equipment, the analyst will help you understand where outside air is entering your home and indoor air is escaping. They can then recommend simple solutions or talk with you about major changes. Visit bpi.org to identify a certified analyst.

TRANSFORM YOUR HOME

Use these creative and common-sense ideas to improve energy efficiency in your abode.

- On a frigid day, run your hands over interior walls, windows, and doors to find areas where cold air may be seeping inside. Fill gaps with gaskets, weather stripping, or expandable foam, all of which are available at most home improvement stores.
- Replace an old showerhead with an aerating, high strength, water-conserving one. Kelly recommends the EcoFIT Bricor showerhead (bricor.com/products/ecofit-1-25-gpm-shower-head/).
- Consider moving your hot water heater closer to your shower, dishwasher, or laundry machine to reduce the distance water travels before arriving at its destination.
- Paint wall surfaces light colors to decrease the need for artificial lighting, and use white and glossy ceiling paint for better light reflection.
- Use a space heater if you need to heat only a single room or small space.
- Choose earthy home décor accent colors to improve your connection with the natural world.
- Schedule an energy audit for the late winter, when demand for energy efficiency services decreases and the temperature difference between outside and inside is still high. ☺



Elvert Barnes

MR. AND MRS. THOMAS DOLAN, IV: REMEMBERING DR. RUTH PATRICK



Dr. Ruth Patrick

ANS Archives Coll. 457

AROUND THE TIME THAT DR. RUTH PATRICK LAUNCHED HER GROUNDBREAKING CONESTOGA RIVER SURVEY AT THE ACADEMY IN 1948, Thomas Dolan began to look to her as his leader—and she was an extraordinary one.

Having just completed his bachelor's in zoology and conservation at Cornell University, Dolan was among two crews that Dr. Patrick hired to study the plants and animals living in Lancaster County's Conestoga Basin. Her goal was to determine the usefulness of these organisms as indicators of sanitary and industrial pollution.

Today, most people remember the Conestoga River Survey for its historical significance, yet Dolan recalls the everyday moments with Dr. Patrick that, for him, largely defined that summer. Dr. Patrick made time for relaxation even as she led the crew to 152 research stations on the Conestoga River's tributaries. Downtime included tennis with Dr. Patrick, followed by dinner and drinks at the famous Stockyard Inn in Lancaster and evenings in the lab.

According to Dolan, Dr. Patrick knew the personalities of her charges well. A number of team members, Dolan included, had returned from World War II just three years before, and at times they tended to be an enthusiastic, rowdy bunch. Dr. Patrick found just the right balance of patience, guidance, and tolerance, Dolan says.

"We respected her greatly for the way she handled people. Without much management experience, she was supervising a bunch of guys who were used to handling themselves. She told them what she wanted them to do and let them do their thing," Dolan says.



Tom and Ibitz Dolan

© 2009 Olan Mills

Work rarely suffered, but when it did, Dr. Patrick was firm yet fair. Finding her staff missing from the lab one evening, she told them they were "grounded" the next day. She did not hold their antics against them, and it is this balance of diplomacy and flexibility that characterized her life and career.

To this day, Dolan lives according to the work ethic, grace, and values he observed in Dr. Patrick during his six years of employment at the Academy of Natural Sciences. The concept of using biodiversity to assess stream health anchored Dolan's studies of water quality, pollution of aquatic ecosystems, open space reservation, and other environmental issues as he served in leadership positions in nonprofit and government environmental organizations, principally in Pennsylvania.

Until Dr. Patrick's passing in September 2013 at the age of 105, Dolan and his wife, Elizabeth (Ibitz) Dolan, shared a strong relationship with her. Ibitz, a dedicated former Academy board member, chair of the Women's Advisory Board, and lifetime honorary trustee, initiated three successful fundraising expositions for the Academy in the 1980s. The couple was especially pleased when Dr.

Patrick received the National Medal of Science from President Bill Clinton in 1996.

Today the Dolans continue to demonstrate their confidence in the Academy's ability to carry on Dr. Patrick's legacy through membership, donations, and program attendance. More than three decades ago, they began making regular contributions to the Annual Fund, eventually becoming members of the Leidy Circle. They have also donated numerous items to the Academy Archives.

"When I see what is happening to the Academy, it's everything that I could have wanted for the institution—from the Archives to the Patrick Center scientists to the work of Bob Peck and Patsy Tyson Stroud in documenting the Academy's history," Dolan says. He admires

George Gephart's bold step to form a productive affiliation with Drexel University. He also is pleased with Academy scientists' efforts to share their work with the public.

Dolan draws inspiration from individuals who are driving the Academy into the future—those following in Dr. Patrick's indelible footsteps.

"A number of years ago, Dr. Patrick invited me over for tea," Dolan says. "She said, 'Now Tom, someday I won't be around anymore, and I want you to let them know how much fun we had.'"

The gleam in Dolan's eye indicates that "fun" just might be an understatement. ~Mary Alice Hartsock

A DOLAN DESCENDANT

Tom Dolan's uncle, Academy naturalist Brooke Dolan, II, conducted two extended and extensive expeditions to western China and eastern Tibet to collect rare high-altitude Asian mammals and birds in the mid-1930s. Dolan's group secured several thousand animal specimens, among them the Academy's giant pandas. Ten-year-old Tom Dolan attended the Panda diorama opening.

MAKING A GIFT THROUGH A WILL

MAKING A BEQUEST GIFT TO THE ACADEMY OF NATURAL SCIENCES OF DREXEL UNIVERSITY may enable you to make a more significant contribution than you ever thought possible, while allowing you to meet other personal financial and philanthropic goals. Bequest gifts offer you a number of benefits:

SIMPLICITY: Just add information to your existing will or living trust, or create a codicil, a document that states what you would like to leave to the Academy after your passing.

VERSATILITY: You can identify a specific item, name a certain amount of money, make the gift contingent on certain events, or leave a percentage of your estate by structuring the bequest according to your desires.

FLEXIBILITY: Since the gift will be made upon your passing, you retain control of the gift and can change your mind at any time throughout your life.

TAX RELIEF: If your estate is subject to estate tax, a bequest gift to a qualified charity, such as the Academy, can defray tax burdens on your heirs.

A charitable bequest works for anyone who would like to provide future support for the Academy, and **YOU** choose the way that your gift will be used. An unrestricted bequest allows the Academy to use the assets where the need is greatest, and a restricted bequest allows you to designate the funds to support your favorite program or field of research. Endowment bequests restrict the principal of your

gift so that the Academy can use only the annual income, allowing the funds to last in perpetuity.

Whatever type of bequest you choose, be sure to consult with your attorney and notify the Academy of your plans. Also, your estate plans should be reviewed regularly so that changes in estate and tax laws or changes in your family's circumstances can be adequately taken into account.

Explore the possibilities! Making a bequest to the Academy in your will or living trust is an excellent way to make a gift with lasting impact. For more information, please contact Amy Miller Marvin, vice president of Institutional Advancement, at 215-299-1013 or marvin@ansp.org.

WELCOMING A NEW TRUSTEE



The Academy is pleased to welcome Ellen D. Harvey to our Governing Board! Harvey is managing director at Miller Investment Management and Principal at Lindsay Criswell, LLC. Since 2004, she has been involved with Miller Investment Management, which manages portfolios through asset allocation for wealthy families, foundations, and endowments. Previously, she worked with Vanguard, Mercantile Bankshares, and Brown Investment Advisory and Trust, following positions with Miller Anderson & Sherrerd and Morgan Stanley. Harvey chairs the investment committee of the Oak Hill Fund and sits on the investment committee of Main Line Health System, where she is a member of the Board of Governors.

Do you love dinosaurs as much as we do?



Buy a Dino Pass—available only to members—and receive unlimited admission to *Dinosaurs Unearthed*! Then, join us for Ferocious February, a month-long celebration of dinosaurs.



Dino Passes are available at our admissions desks. Visit ansp.org for details.

ON BEHALF OF THE ACADEMY'S BOARD OF TRUSTEES, we wish to recognize and thank those who have contributed to the Academy between September 1 and November 30, 2013. Your generosity helps to fund our many programs of research and education, and we are tremendously grateful for your support.

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Jennifer Unterberger (left), Elaine Battaglia, and nearly 400 others enjoyed collection-inspired treats at Cuisine from the Collections on Nov. 2.

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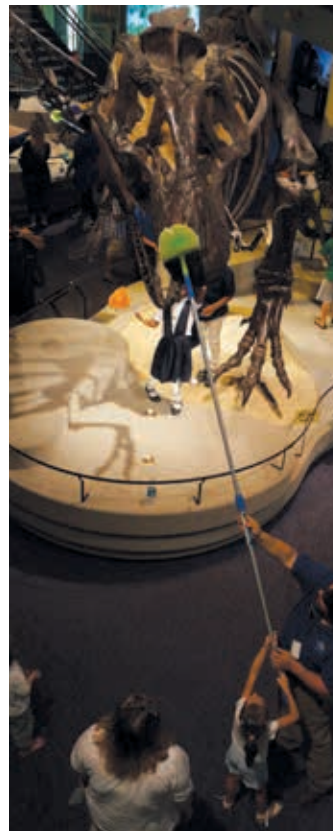
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Members' Night 2013 drew record-breaking attendance. Our classic activity, Dusting the Dinosaurs, was a big hit with younger attendees!

We would especially like to recognize those who have joined or renewed their support in the Academy's Leadership Circles of Giving between **September 1 and November 30, 2013.**

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FEROCIOUS FEBRUARY

This winter the Academy takes you back in time with Ferocious February, a month of dinosaur-themed activities to complement our special exhibit, *Dinosaurs Unearthed*. An adult paleo-illustration class, a dino-themed Safari Overnight, and a Mega-Bad Jurassic Park Movie Night all offer chances to see the roaring, life-size animatronic dinosaurs in the Special Exhibits Gallery. Paleopalooza (Feb. 15–16), our annual two-day festival of gigantic proportions, showcases our world-famous fossils and paleontology research. Extra fee to enter the exhibit applies.



Bob Sprague

SAVE THE DATE: ORCHIDS

Mark your calendars! On April 11–13, the International Orchid Show will transform the Academy of Natural Sciences of Drexel University into a spectacular world of orchids. See thousands of orchids from all over the globe, and purchase plants from vendors from as far away as California, Ecuador, Brazil, Japan, Malaysia, and Taiwan. The International Orchid Show is presented in collaboration with the Southeastern Pennsylvania Orchid Society (sepos.org). For more information call 215-299-1000 or visit ansp.org/orchidshow.

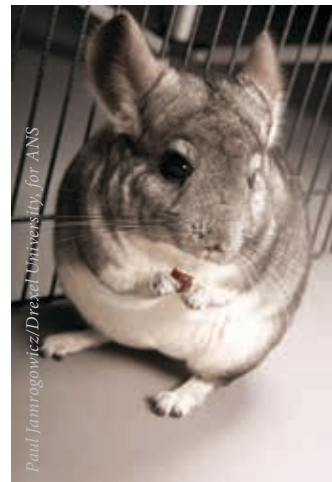
MEMORIAL SYMPOSIUM

On Tuesday, April 22, the Academy will host a memorial symposium to honor Dr. Ruth Patrick, whose pioneering environmental research at the Academy set the stage for generations of scientists interested in aquatic ecology and conservation. Thomas Lovejoy, famous for his path-breaking use of the term “biological diversity” in 1980, will be joined by other experts in aquatic ecology and management. We hope you will join us as we discuss the critical environmental issues Dr. Patrick first investigated many years ago.



ANS Archives Coll. 457

ANIMALS IN MOTION WEEKEND



Paul Jamrogowicz/Drexel University, for ANS

Find out how you measure up to some of the star performers of the live animal kingdom on January 18, 19, and 20 at the Academy. Test your strength against the jaws of an alligator, learn the amazing secrets of a common egg, and marvel at the acrobatics of birds on the wing. See firsthand how scientists use the feats of the animal kingdom in their daily work.



OUTSIDE IN RENOVATIONS

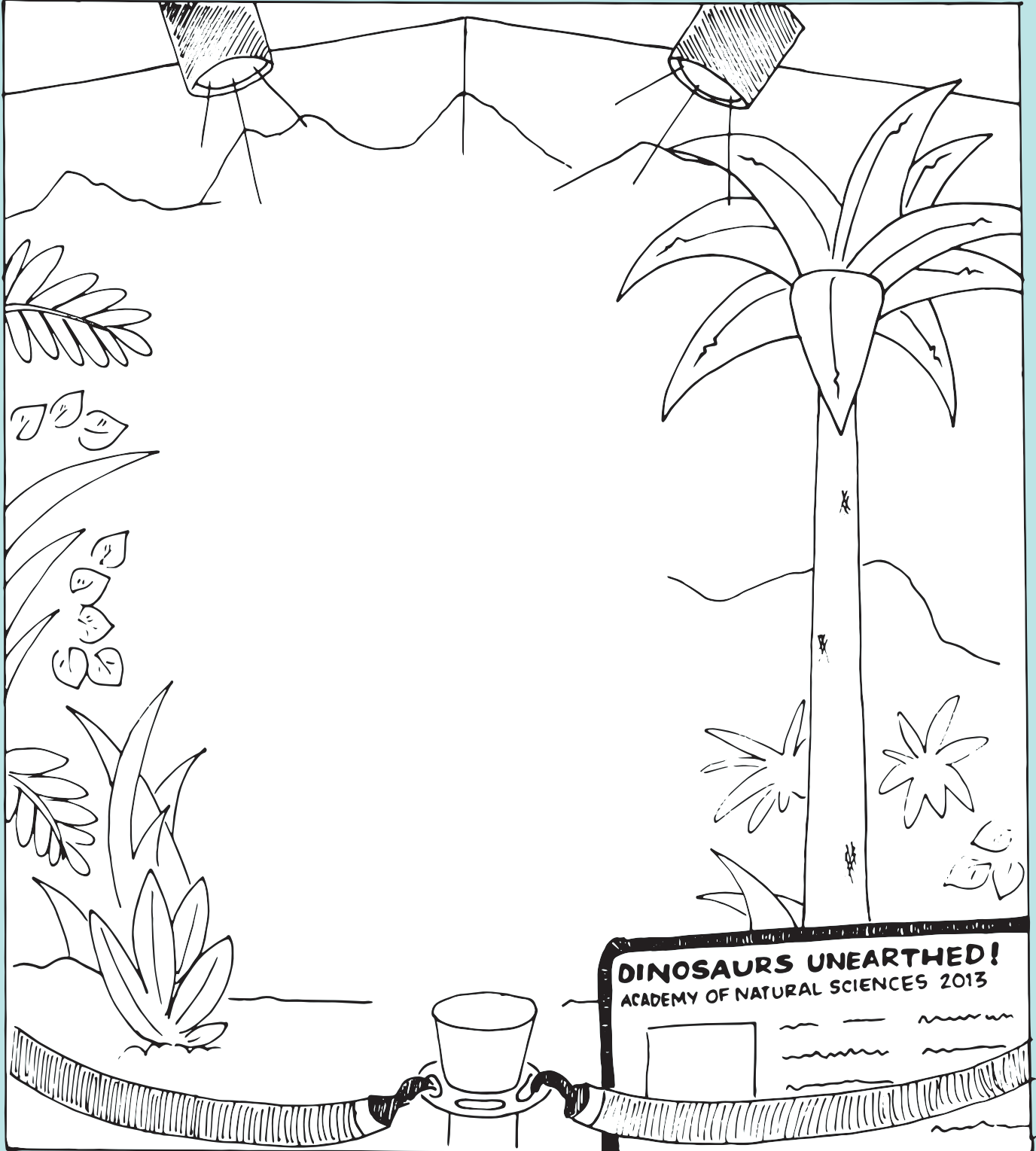
Outside In, the Academy’s popular nature discovery center for children, will be closed Monday, January 6 through early February as we make it better than ever! You can expect new activities and play areas, costumes, an updated sandy beach with seating for parents, better housing for our live animals, and more. In the meantime, Ferocious February will keep your kids busy in the museum!



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!

Draw a dinosaur and color or decorate it for your chance to win a prize!
Two lucky winners will receive a free renewal of their household's membership plus a surprise.



Christine Damowsky/ANS

Please write your name, age, and contact information on the back of your drawing and mail to Academy Membership Office, 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103, or drop off your drawing at either of our admissions desks during your next visit (be sure to address it to Academy Membership Office). Contest deadline is March 1, 2014. Prizes awarded for ages 3–6 and 7–12.

CALENDAR OF EVENTS



Eastern Towhee (*Pipilo erythrophthalmus*)

© Johann Schumacher/VIREO

JANUARY

**GUBERNATORIAL FORUM:
SUSTAINABILITY**

Monday, January 13, 6 p.m. **M**

ANIMALS IN MOTION WEEKEND

Saturday through Monday, January 18–20
10 a.m.–5 p.m. **M**

REPTILE SKETCHING ADULT CLASS

Wednesday, January 22, 6–9 p.m. **\$** **🕒**

FEBRUARY

PALEO-ILLUSTRATION ADULT CLASS

Saturday, February 1, 10 a.m.–4:30 p.m. **\$** **🕒**

**FEROCIOUS SAFARI OVERNIGHT:
DINOSAURS!**

Saturday, February 1, 6:30 p.m. **\$** **🕒**

TINY TOT EXPLORERS

Wednesdays, February 5–March 19,
11 a.m.–noon **\$** **🕒**

SCIENCE ON TAP FEATURING

DR. KEN LACOVARA

Monday, February 10, 6 p.m.
22 S. 3rd St., Philadelphia

PALEOPALOOZA

Saturday and Sunday, February 15–16
10 a.m.–5 p.m. **M**

MEGA-BAD MOVIE NIGHT:

JURASSIC PARK III

Thursday, February 20, 6:30–10 p.m. **\$** **🕒**

KIDS CLUB EVENT: DINOSAURS

Saturday, February 22, 9:30–10:30 a.m. **🕒** **M**



Dark-eyed Junco (*Junco hyemalis*)

© Gerard Bailey/VIREO

M Free for members **\$** Fee **🕒** Registration required

Unless otherwise noted, all events held at the Academy are free with museum admission.*
*\$3 member fee for *Dinosaurs Unearthed*, or purchase a Dino Pass for unlimited free admission.

Visit ansp.org for more information and to register.

MARCH

ANIMALS WITH SHELLS ADULT CLASS

Monday, March 3, 6–9 p.m. **\$** **🕒**

FRIENDS AND FAMILY SAFARI OVERNIGHT

Friday, March 14, 6:30 p.m. **\$** **🕒**

RICK PRUM LECTURE:

WHY DINOSAURS ARE BIRDS

Thursday, March 27, 6 p.m. **M**

LAST DAY TO SEE

DINOSAURS UNEARTHED

Sunday, March 30, 10 a.m.–5 p.m. **\$**



Blue Jay (*Cyanocitta cristata*)

© Garth McElroy/VIREO

APRIL

CITY TREES ADULT FIELD STUDY

Saturday, April 5, 10 a.m.–1 p.m. **\$** **🕒**

MUSEUM CLOSED

(Orchid Show set-up)
Thursday, April 10, all day

SEPOS INTERNATIONAL ORCHID SHOW

Friday, April 11, noon–8 p.m.
Saturday and Sunday, April 12–13,
10 a.m.–5 p.m. **M**