

THE ACADEMY
OF NATURAL SCIENCES

of DREXEL UNIVERSITY

The Academy of Natural Sciences of Drexel University

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Dear Friends of the Academy,

THE ACADEMY'S 199TH YEAR was one of momentous change, as we came together with Drexel University to form a groundbreaking affiliation that will alter the face of scientific discovery in our community. With overwhelming enthusiasm, our Board of Trustees and members approved this his-

toric affiliation. Finalized in the fall, the partnership will further establish Philadelphia as a city central to the advancement of scientific research and education. Drexel's resources, along with its remarkable science, will enable the Academy to advance our science and museum more comprehensively than we could have on our own. We are extremely proud of one of the first outcomes of the affiliation, a new Drexel department called Biodiversity, Earth, and Environmental Science (BEES), which will unite Academy and Drexel scientists with a focus on the natural and environmental sciences. Our promising future is the reason to celebrate.

In 2011, the Academy was reaccredited by the American Association of Museums (AAM). This reaccreditation is a widely recognized seal of approval and an acknowledgment of many of the Academy's accomplishments, such as the establishment of the historic affiliation and its potential to enhance academic, research, and public programs in natural science education. AAM also commended the Academy's environmental research; exemplary care of public exhibits and internationally significant biological collections; and inclusive educational programs that engage underserved groups such as girls and urban youth.







This annual report covers many of these 2011 successes, from our record-breaking attendance at Paleopalooza and a new interactive exhibit built entirely in house to the buzz surrounding our investigation of the potential impacts of Marcellus Shale drilling and the addition of more than 240,000 items to our collections. Our scientists guided more than 3,400 people behind the scenes in 2011 and educated many more at Science Live and during events and festivals. On top of these achievements, the Academy began a comprehensive strategic planning process to create a Sustainable Strategic Plan that will position the institution for success over the next five years and beyond.

As we move forward, we strive to make the Academy the place where visitors become inspired by nature and develop strong foundations in natural science knowledge. We thank our members, donors, volunteers, staff, and visitors for making the Academy an irreplaceable institution in the Philadelphia area. We look forward to continuing to build our community with you at this pivotal time in our history.

Sincerely,

George W/Gephart, Jr. President and CEO

The Academy by the Numbers

General Visitors	225,213
Schoolchildren	34,461
Individuals Served Through Outreach Programs	20,191
SCIENCE AND RESEARCH	
New Species Described	
Research Publications	60 *
Research Presentations	61
Educational Conference Presentations	10
Field Trips and Expeditions	82
Images in Visual Resources for Ornithology	166,000
Technical Reports	16
COLLECTIONS	
New Specimens Accessioned Into the Collections	39,330
Specimens Loaned to Other Researchers	
Visiting Researchers	225
Students and Other Visitors	3,198
LIBRARY	
Total Library Visitors	
Total Library Visitors	
Total Library Visitors Total On-site Researchers in the Library and Archives. COMMUNICATIONS	600
Total Library Visitors Total On-site Researchers in the Library and Archives COMMUNICATIONS National News Stories	600
Total Library Visitors Total On-site Researchers in the Library and Archives. COMMUNICATIONS National News Stories. Facebook Fans	24
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Total Library Visitors Total On-site Researchers in the Library and Archives COMMUNICATIONS National News Stories Facebook Fans Twitter Followers Visits to ansp.org VOLUNTEERING Number of Volunteers Number of Volunteer Hours Contributed MEMBERSHIP Academy Member Households	

^{*}Visit ansp.org/about/publications/ to view a complete listing of all 2011 Academy publications.





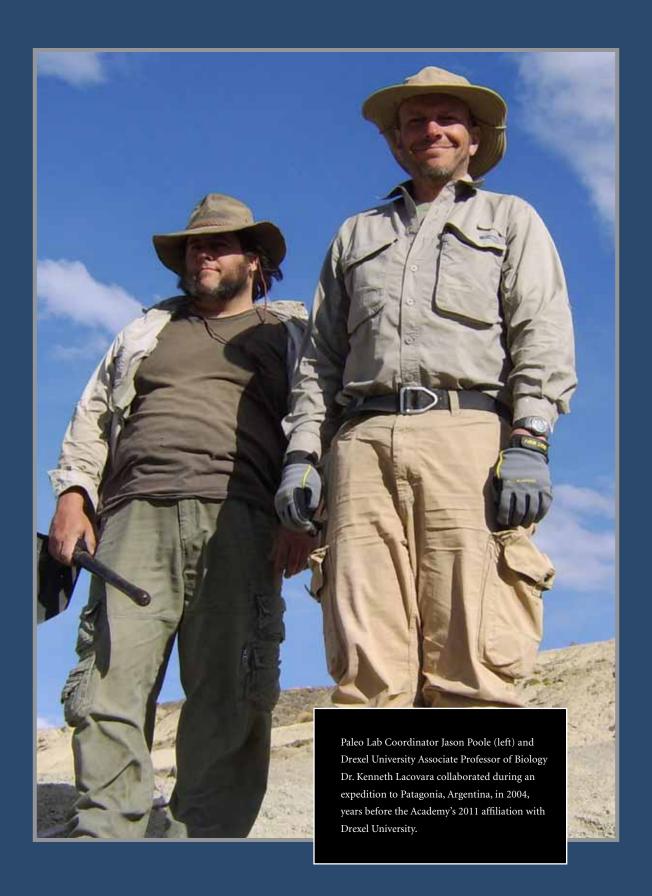
THE ACADEMY AND DREXEL PARTNERSHIP

CREATING A

SCIENTIFIC POWERHOUSE IN

PHILADELPHIA

IN MAY 2011 Academy of Natural Sciences President and CEO George W. Gephart, Jr., and Drexel University President John A. Fry announced a unique affiliation that unites two of the city's most respected research institutions. The partnership will further enhance Philadelphia's reputation as a leader in scientific research and education and will promote discovery, learning, and civic engagement in the natural and environmental sciences.



The Academy and Drexel Partnership continued...



Plans for the affiliation received unanimous approval from the institutions' Boards of Trustees in May and near unanimous approval at a special members' meeting in September. On October 26, the newly named Academy of Natural Sciences of Drexel University hosted a free day for the public to celebrate this milestone. The Academy's Board continues to oversee the institution's operations as a nonprofit affiliate of Drexel, and the Academy remains a separate 501(c)(3) organization, its legal name unchanged.

The affiliation promotes a sustainable future for the Academy by providing countless opportunities for collaboration, access to additional resources, and innovative, new ways to access our rich collections and science. The new relationship will enable shared research on issues such as environmental degradation, biodiversity, global ecosystem interactions, and sustainability. Scientists from both institutions have joined forces to design a new department at Drexel called Biodiversity, Earth, and Environmental Science (BEES), which will accept its first students in fall 2012 and offer teaching opportunities for Academy scientists. Other exciting benefits include the chance to work with Drexel's media arts experts to enhance exhibits, the opportunity to cooperate with Drexel educators to improve programming for students and teachers, and an already active alliance with Drexel's technology team to launch a new and improved ansp.org.

The Academy of Natural Sciences of Drexel University will continue to stand at the forefront of scientific research and education and will further establish Philadelphia, the birthplace of modern science in North America, as a city central to the advancement of the natural and environmental sciences.





Above: Academy and Drexel researchers surround a nearly 3-ton field jacket from a dig in Patagonia.

Below: Drexel University President John Fry (center left) and Academy President and CEO George W. Gephart, Jr., pose with the institutions' mascots on Affiliation Day.



PUBLIC PROGRAMS

Sharing our Knowledge

The Academy's public programs and exhibitions connect our behind-the-scenes science with our ever-growing community. In 2011, we guided eager schoolchildren, educated families at programs and festivals, and helped adult visitors rediscover a childlike sense of amazement at the natural world.

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Paleopalooza, the annual two-day paleontological extravaganza, broke previous records with almost 5,000 visitors. Mega-Bad Movie Night opened to the public officially in 2011 with *Mega-Shark Versus Crocosaurus*. More than 730 people enjoyed hilarious commentary on awesomely awful pseudo-science flicks throughout the year.

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In August the Academy and local blog Geekadelphia rolled out the red carpet for the Geek Awards, the first Academy Awards-style ceremony celebrating Philadelphia's "geek" scene. Local celebrities presented awards for local achievement in technology and science at this sell-out event.

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In November 1,200 Philadelphia sixth- through eighth-graders and their teachers came to the Academy to learn about career opportunities in the sciences during two career days made possible by a grant from FMC Corporation with support from Pfizer. Education staff also started a PNC Grow Up Great with Science professional learning community with KenCrest Services early childhood educators to evaluate science teaching methods in low-income neighborhoods. With support from PNC and Drexel's Math Forum, participants reached more than 250 students.

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Exhibits experts created and installed *Secrets of the Diorama*, bringing the Academy's legendary dioramas to life. The exhibit contains touchable items, interactive activities, videos, graphics that tell the story of our dioramas, and more.

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Exhibits and entomology staff helped visitors see insects through the eyes of a renowned scientist. Installed in the Art of Science Gallery, *Dual Nature: Science Illustrations of Dan Otte* displayed remarkable drawings from the Academy's Curator of Entomology and the world's leading expert on grasshoppers and crickets.



Public Programs continued...

An Academy team led by the Exhibits Department completed important renovation projects funded by the Board of Trustees and aimed at dressing up the Academy in anticipation of the Bicentennial. This work included creating *Secrets of the Diorama*, repainting, touching up exhibits and galleries, and preparing a new wayfinding system.

Above: Academy Explorers Camp attendees check out one of our live animal ambassadors, a common green iguana named Indiana.

Below: Patrick Center scientist Michelle Brannin helps program participants identify macroinvertebrates during an adult field study at Crabby Creek in Chester County, Pennsylvania.





Photo by Conrad Erb Photography

THE CENTER FOR SYSTEMATIC BIOLOGY AND EVOLUTION Making Research Accessible

Academy scientists travel the world to understand and document the diversity of life, sharing their discoveries with the public and researchers through extraordinary collections and innovative programming. In 2011 scientists guided more than 3,400 people, including 229 researchers, behind the scenes and demonstrated their work in the museum. Scientists described seven new species, added more than 240,000 items to the collections, and fulfilled over 2,000 information requests from outside researchers.

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Ornithology Collection Manager Dr. Nate Rice conducted a second collecting trip to Vietnam to search local and migratory bird populations for emerging diseases such as avian influenza, which might be transferable to humans. The expedition supports the work of the U.S. Centers for Disease Control and Prevention (CDC) and was funded by the University of Kansas' Natural History Museum through a major CDC grant.

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Paleontologists Dr. Ted Daeschler and Dr. Jason Downs and colleagues described a new species of predatory fish, *Laccognathus embryi*, which lived during the Devonian Period in what is now the Nunavut Territory of Arctic Canada. The National Science Foundation-funded discovery of this 375-million-year-old beast confirms direct connection of the North American and European landmasses during the Devonian.

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An international team of scientists, including Curator of Ichthyology Dr. John Lundberg, helped reset the Amazon region research agenda by showing that the area's extraordinary diversity is much older than many scientists believe. The Amazon is the world's most species-rich terrestrial ecosystem, and many previously unseen species are documented there every year. Though scientists debate the timing and causes of this diversity, Lundberg and colleagues argue that the diversity evolved from Andean mountain uplift over millions of years.

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Entomology Curator Dr. Jon Gelhaus received the "Best Scientist in Nature and Environment" medal from the Mongolian Ministry of Nature for his significant contribution in Mongolian Environmental Science. Gelhaus, who has been conducting research in Mongolia for 15 years, is leading a multinational effort to improve water quality monitoring and standards in Mongolia through insect sampling in streams and rivers.



THE ACADEMY LIBRARY AND ARCHIVES

Enhancing Natural Science Learning

The Academy's Library and Archives links today's science with individuals who colored the last 199 years of Academy history. Here is a true community, uniting Academy scientists past and present, researchers worldwide, natural science enthusiasts, and Philadelphia learners of all ages. During 2011, more than 4,500 visitors, including Academy staff, Drexel colleagues, Trustees, research scholars, VIPs, film crews, and others used the Library reading room. More than 600 researchers consulted Library and Archives collections on-site.

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Page turnings of John James Audubon's *The Birds of America* attracted 1,100 visitors, with a 70 percent increase since July 1 when staff transitioned from a weekly to daily page turning. The event gained coverage from *The Philadelphia Inquirer, The Daily News, Don Pollock's World*, AP, and BBC. Comprised of 435 life-size, hand-colored engravings, this double-elephant folio edition is a prized holding in the Library's rare books collection and one of fewer than 200 surviving original sets.

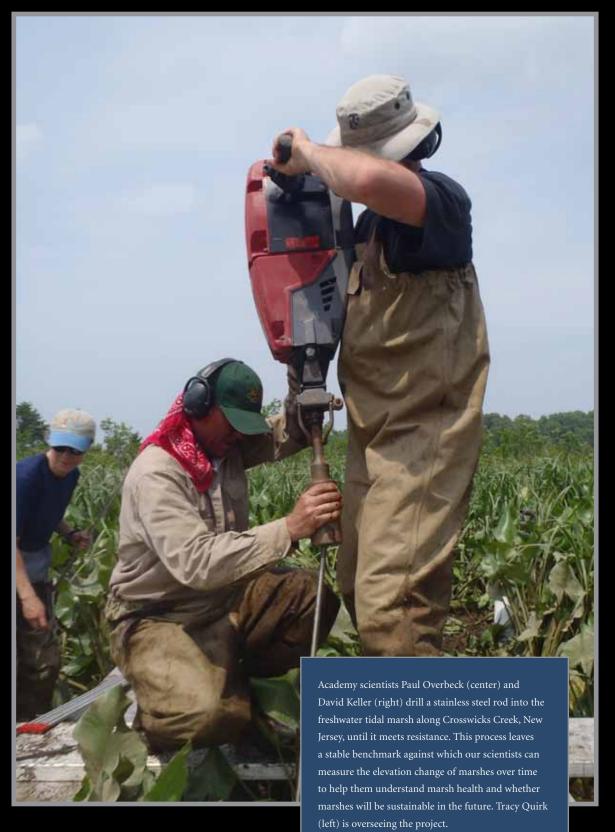
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Library staff created nearly 700 high-resolution digital images of rare book plates and archival items to enhance the accessibility and increase use of these items. Staff began digitizing the papers of Joseph Leidy (ANSP Archives Coll. 1), a collection heavily consulted by outside researchers studying the history of science. This collection encompasses thousands of letters requesting the expertise of the former Academy curator, president, and scientist who described *Hadrosaurus foulkii*, the first nearly complete dinosaur skeleton discovered in North America.

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The Library received nearly 50 monographs from the ornithology library of the Academy's dear friend and Trustee, the late William L. McLean III. McLean was fascinated with ornithology and committed to enriching the Library. His estate permitted Academy staff first choice of his ornithology titles. Acquisitions range from early 20th-century field guides to a new book on the making of Audubon's *The Birds of America*. Librarians placed custom book plates in each volume, and the catalog is searchable by "William L. McLean III," providing lasting acknowledgement of this contribution (http://nolan.ansp.org/search).

Image of a Black Skimmer from the Academy's original, double-elephant folio edition of John James Audubon's *The Birds of America*. ANSP Coll. 2012-013



THE PATRICK CENTER FOR ENVIRONMENTAL RESEARCH Monitoring the Health of our Natural Resources

The Academy's Patrick Center scientists research, monitor, and evaluate water quality in streams, lakes, and rivers near Philadelphia and throughout the world. They analyze water and sediment samples and study plants and animals within many different aquatic ecosystems. In 2011, Patrick Center researchers worked to develop strategies for evaluating environmental quality in watersheds that sustain our communities. They shared information about the earth's resources through demonstrations on the museum floor, at community events, and at national scientific meetings.

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Patrick Center scientists studied the potential impacts of Marcellus Shale drilling on the ecology of streams in the Upper Susquehanna and Delaware River basins. The team is working to understand drilling's cumulative effects on small streams by examining the water chemistry, algae, aquatic insects, fish, and amphibians in areas with a range of drilling pad densities. This work could potentially identify the threshold at which the intensity of mining presents a significant risk to water quality.

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Scientists from the Academy's phycology and biogeochemistry teams joined New Jersey's Department of Environmental Protection and research institutions across the region to assess the health of Barnegat Bay. They are part of a bay-wide water quality monitoring network gathering data on how water circulation within the bay and nutrients from fertilizer runoff affect the bay's health.

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Staff continued monitoring pollutant concentrations in fish collected from New Jersey lakes and streams and studied the impacts of land use and climate change on Pennsylvania's Tinicum Marsh. Farther afield, they investigated algae blooms and pollution in the East China Sea.

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Director of the Asia Center Clyde Goulden and his team interviewed nomadic herders in Mongolia about their perceptions of recent environmental changes and the impacts of potential climate changes on steppe grazing pastures. Supported by the National Science Foundation, this research showed that colder weather in northern Mongolia, created by warming trends to the south, has significantly impacted livestock grazing, forcing many herding families to give up their age-old way of life.



THE CENTER FOR ENVIRONMENTAL POLICY

Promoting Sustainable Practices Locally

The Academy's Center for Environmental Policy is a key player in the environmental and sustainability community of the greater Philadelphia region. The Center provides nonpartisan, science-based information on important environmental issues, promotes solutions, and builds awareness by encouraging conversation among top scientists, policymakers, and the general public. The issues addressed in the Center's public forums deeply affect our lives.

The Center sponsored 31 public programs in 2011, drawing more than 4,500 participants. Prominent speakers included Dr. Jack Horner, author and paleontologist; Dr. Tim Flannery, author and climate advocate; Michael Krancer, secretary of the Pennsylvania Department of Environmental Protection; Dr. Christopher Magadza, co-recipient of the 2007 Nobel Peace Prize; Michael Nutter, mayor of the City of Philadelphia; and Judy Wicks, author and activist.

A focus of the Center is the Urban Sustainability Forum, which the Academy sponsors and hosts with a coalition of more than 20 organizations and public agencies. These monthly panel discussions support the goal of making Philadelphia the "greenest" city in America. In March and April, the Academy, the Urban Sustainability Forum, and Next Great City Coalition hosted forums with Philadelphia City Council at-large candidates. Democratic and Republican candidates presented their positions on energy, waste, and access to food.

In June, the Clean Air Council, the Academy, and the Community Action Forum on Marcellus Shale Gas co-hosted an educational forum about drilling for natural gas in the Marcellus Shale. The forum provided an overview of the environmental, health, and economic issues related to the drilling, with presentations from experts in environmental stewardship, public policy, energy production, and government regulation.

The Center continued its Profitable Pathways to Sustainability initiative, which supports local business leaders in creating sustainable organizations. The initiative produced six leadership meetings with speakers representing Johnson & Johnson, IKEA, Drexel University, Case Western Reserve, SAP, and Viridity Energy. The Center also held two steering committee retreats to refine the vision for the initiative.

INSTITUTIONAL ADVANCEMENT

Sustaining our Outreach

Communications and development endeavors in 2011 enabled the Academy to publicize and cultivate its programs of research and education. Public relations efforts elicited 38 full features by local television stations. On ansp.org we shared our fascinating history through a story a day for 200 days leading up to the Bicentennial.

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The Academy's fundraising efforts enabled Institutional Advancement to exceed net revenue goals by more than \$72,000 in 2011. The Academy began actively marketing its new planned giving program with targeted mailings to prospective contributors. Staff also launched a robust new corporate development program, sparking a 36 percent increase in corporate partners.

Other highlights include:

- A 16 percent increase in general attendance
- A 6.5 percent increase in Annual Fund revenues
- A near 50 percent increase in restricted and endowment giving
- A 94 percent increase in online donors
- A 50 percent increase in Facebook fans
- A 127 percent increase in Twitter followers

IN MEMORY

IN LATE AUGUST, the Academy lost a friend and advocate, William L. McLean III. Bill was an Academy Trustee for more than 20 years and a trustee emeritus since 2006, serving on the executive, science, and education and exhibits committees. As chair of the Library committee for more than a decade, he worked to establish endowed funds for collections conservation, book purchases, and staff positions. In 2006, Bill received the



From left: Bill and Elizabeth McLean became involved with the Academy in 1977. Their daughters, Sandra McLean (a Trustee) and Lisa McLean, are members and long-time supporters.

Academy's Maclure Award, which recognizes discovery, vision, and philanthropy.

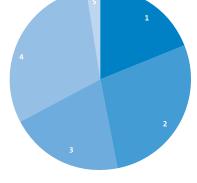
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FINANCIALS

(As of December 31, 2011)

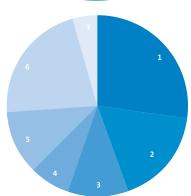
Revenue and Support 2011

Total Revenue and Investment Activity	\$ 10,495,076
Investment Activity	(4,024,718)
Total Revenue	\$ 14,519,794
5. Other Income	359,290
4. Research and Education Funding	4,362,523
3. Endowment Income	2,966,997
2. Contributions, Bequests, and Memberships	4,060,364
1. Admissions, Sales, and Fees	\$ 2,770,620



Expenses 2011

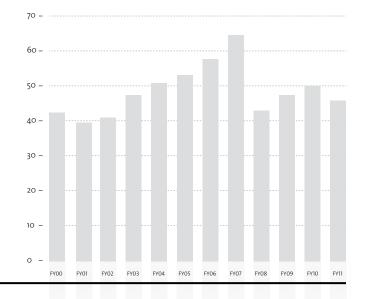
Total Expenses	\$ 17,351,518
7. Library	752,324
6. Depreciation and Other	3,754,841
5. General and Administrative	1,998,892
4. Fundraising and Communications	1,236,440
3. Building	1,856,032
2. Education and Exhibits	3,022,145
1. Collections and Research	\$ 4,730,844



Endowment Growth (in millions)

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2000	\$ 42.690
2001	39.794
2002	41.146
2003	47.463
2004	51.066
2005	53.230
2006	57.827
2007	64.743
2008	43.115
2009	47.439
2010	50.024
2011	\$ 45.794



Net Assets 2011

Change in Net Assets	\$ (6,856,442)
End of Year	62,208,368
Beginning of Year	\$ 69,064,810



thank you!

On behalf of the Academy's Board of Trustees, we wish to recognize and thank those supporters who contributed to the Academy between January 1 and December 31, 2011. Your generosity helps to fund the Academy's many programs of research and education, and we are tremendously grateful for your support.

\$200,000 AND ABOVE

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Anonymous

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The McLean Contributionship

\$50,000-\$99,999

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oto by Ray Skwi

The internal chambers of a nautilus shell, featured in the Academy's Marveling at Mollusks exhibit.



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IN 2011 490 volunteers from all parts of our community contributed 35,858 hours to the encouragement and cultivation of the natural and environmental sciences. Volunteers guided exhibit visitors, offered long-term support to Academy researchers, and provided vital assistance during special programs and events such as Paleopalooza, Bug Fest, and Members' Night.

We were privileged to work with PNC Bank volunteers who contributed more than 80 hours of service to the Head Start on Science program, a partnership between the Academy, the Please Touch Museum, and the School District of Philadelphia that provides 200 area preschool educators with handson science training. We were also fortunate to work with FMC Corporation volunteers. These volunteers gave more than 200 hours during the Academy's STEM Career Days, designed to help Philadelphia public middle school students and their teachers get information about learning and career opportunities in science, technology, engineering, and math.

IN MEMORY

THE ACADEMY lost a good friend in the spring with the passing of Albert "Al" Visco, a longtime volunteer in the Department of Vertebrate Paleontology. For more than 14 years, we spent Thursdays with Al in the Vertebrate Paleontology Preparation Lab. As a fossil preparator, he worked on Devonian fossils that the Academy's research expeditions recovered from sites in the Catskill Formation of northern Pennsylvania and the Nunavut Territory in the Canadian



Arctic. Al's enthusiasm and dedication resulted in lasting contributions to the fossil collection.

We thank the following volunteers for contributing more than 100 hours of service during 2011.

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Malacology Department volunteers Nick and Betty Ruggeri have a combined total of more than 30 years of volunteering at the Academy.

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Ornithology Collection Manager Dr. Nate Rice examines an Omei Warbler (*Seicercus omeiensis*) collected during the Academy's Sinkler expedition to Thailand in 1938. This important species is one of many that Rice collected during his 2011 expedition to Vietnam.



Photo by Doug Wechsler/ANSP

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