Dear Museum Friends,

It is my pleasure to welcome you back to *Field Notes*, the San Diego Natural History Museum magazine designed exclusively for members and friends of the Museum.

*Field Notes* will be published three times a year and will showcase Museum research, exhibitions and upcoming events. We look forward to sharing insights on Museum collections, stories about educational programs, behind-the-scenes looks at exhibitions, special membership opportunities and so much more.

This issue focuses on education and research—two cornerstones of our mission. Inside you'll read about dinosaur discoveries, activities of our research department, results from our 3rd-annual BioBlitz and the upcoming *Sustainable Planet* lecture series on children and nature.

I hope you enjoy this issue of *Field Notes*. It is a pleasure and an honor to share all of our wonderful Museum projects and programs with you. Thank you for your continued support and commitment to the San Diego Natural History Museum.

Sincerely,

Michael W. Hager, Ph.D.

President and CEO

---

**FROM THE PRESIDENT**

**Curator’s Corner**

**Notes from the Biodiversity Research Center of the Californias**

**Botany**

Jon Rebman, Ph.D., joined other botanists in May on Guadalupe Island, Mexico, to evaluate the recovery of the botanical resources on the island since the removal of goats in the last few years. Guadalupe Island is home to many endemic plant species which were either driven to extinction or severely impacted during the 150+ years of grazing by introduced goats. The trip yielded re-discoveries of various plants that were thought to be extirpated, the discovery of new records for the island, and at least one possible new species for science.

**Entomology**

On a recent trip to Baja California, Curator of Entomology Michael Wall, Ph.D., discovered an undescribed species of insect (Hemiptera) known from only two areas in Baja California. Feeding exclusively on Mexican Blue Fan Palms, these insects can congregate in large numbers. Together with colleagues in Mexico, Dr. Wall is studying how populations of these insects can impact palm communities.

**Herpetology/Birds & Mammals**

The San Jacinto Centennial Resurvey is retracing the 1908 expedition of Joseph Grinnell, Harry Swarth, Walter Taylor, and Charles Richardson.

**BioBlitz**

The San Diego Natural History Museum held its third annual BioBlitz on May 21–22 in Torrey Pines State Natural Reserve. Scientists and volunteers raced the clock to record how many species of flora and fauna could be found in this specific area in a 24-hour period. A total of 1129 species were counted in 24 hours! Specifically, the researchers counted 72 birds, 11 herpetology species, 25 mammals, 41 species of algae and diatoms, 325 plants, 112 miscellaneous insects, 4 scorpions, 40 flies, 109 beetles, 116 bees and wasps, 79 spiders, 6 myriapods, 153 butterflies, and 36 molluscs.

**FROM THE PRESIDENT**

**Best known for their bird and mammal accounts, the original team also collected and wrote on the region’s amphibians and reptiles. Field sites from the desert floor to high mountain meadows are being revisited to track biodiversity over the last one hundred years.**

**Vertebrate**

On a recent trip to Baja California, Curator of Vertebrate Michael Wall, Ph.D., discovered an undescribed species of mammal (Hemiptera) known from only two areas in Baja California. Feeding exclusively on Mexican Blue Fan Palms, these insects can congregate in large numbers. Together with colleagues in Mexico, Dr. Wall is studying how populations of these insects can impact palm communities.

**BioBlitz**

The San Diego Natural History Museum held its third annual BioBlitz on May 21–22 in Torrey Pine State Natural Reserve. Scientists and volunteers raced the clock to record how many species of flora and fauna could be found in this specific area in a 24-hour period. A total of 1129 species were counted in 24 hours! Specifically, the researchers counted 72 birds, 11 herpetology species, 25 mammals, 41 species of algae and diatoms, 325 plants, 112 miscellaneous insects, 4 scorpions, 40 flies, 109 beetles, 116 bees and wasps, 79 spiders, 6 myriapods, 153 butterflies, and 36 molluscs.

---

**Contributors**

Eowyn Bates, Margaret Dykens, and Delle Willett

**The Membership Department can be reached Monday–Friday, 9 AM–5 PM for assistance with change of address, replacement cards, renewing or upgrading your membership and any other questions. Contact 619.255.0275 or membership@sdnhm.org.**

**San Diego Natural History Museum Mission:**

To interpret the natural world through research, education and exhibits, to promote understanding of the evolution and diversity of southern California and the peninsula of Baja California, and to inspire in all a respect for nature and the environment.

San Diego Natural History Museum
1788 El Prado, Balboa Park
San Diego, CA 92101
Phone: 619.232.3821  www.sdnhm.org

Copyright © 2010 by the San Diego Natural History Museum. Reproduction in whole or in part without the written permission of the San Diego Natural History Museum is prohibited.

---
followed by three additional finds by Riney in the same Cretaceous-age (~75 million years old) sedimentary rocks; an incomplete dinosaur foot bone, a series of 11 hadrosaur tail vertebrae, and a partial skeleton of an armored dinosaur, later described and named Aletopelta coombsi. Around that same time, Leon Case discovered a partial hadrosaur jaw in a beach cobbler eroded from the sea cliffs at Sunset Cliffs. To date, 13 separate dinosaur discoveries have been made in southern California (see Table 1). All seven San Diego County discoveries are now housed in the Paleontology Department at the San Diego Natural History Museum. Many of these are displayed in the Museum’s Fossil Mysteries permanent exhibition.

In most people’s minds the finding of dinosaur fossils is an event associated with remote localities in the western interior of North America, such as Canada, Montana or Wyoming, rather than urban sites in southern California. Nevertheless, remains of dinosaurs have been found in central and southern California and Baja California, Mexico. Certainly, the dinosaur-producing localities of California cannot compare with those of the western interior in terms of numbers and variety of fossils, but their occurrence does add to our understanding of the distribution of North American dinosaurs. The western interior localities and those in California also differ in terms of the duration of the evolutionary history of dinosaurs which they preserve. Western interior localities preserve essentially the entire dinosaurian record of the Mesozoic Era from the Late Triassic (230 million years ago) through the Late Cretaceous (65 million years ago). This record of some 165 million years stands in marked contrast to the scant ten-million-year record preserved at the southern California sites. The west coast localities are all of Late Cretaceous age (70 to 80 million years old) and record only the twilight interval at the end of the so-called “Age of Reptiles.”

The first recorded dinosaur from California was found in 1936 near the town of Patterson, in the central San Joaquin Valley. This specimen is a partial skeleton of a hadrosaur. Hadrosaurs were a morphologically diverse group of Cretaceous ornithischian dinosaurs, best described as large bipedal herbivores. One writer has called them “two-legged cow lizards” because of their generally upright posture and vegetarian diet. Following the 1936 discovery, two additional and more complete hadrosaur skeletons were found in the San Joaquin Valley. All three of these San Joaquin Valley specimens were studied by the late Dr. William J. Morris, formerly of Occidental College. Dr. Morris concluded that these specimens were most closely related to a group of hadrosaurs known today as the Saurolophini. He further suggested that they probably belonged to the genus Saurolophus known from the Late Cretaceous of Canada. Interestingly, the first

Interestingly, the first dinosaur found in California now happens to be the most abundantly found dinosaur in California!
dinosaur found in California now happens to be the most abundantly found dinosaur in California! At least 92 fossil specimens of hadrosaurs have been discovered in both Baja California and southern California sites, so it is likely that hadrosaurs were here but their remains have simply not yet been found.

Although it is the most complete dinosaur fossil known from California, the ankylosaur skeleton found by Finney does not preserve evidence for addressing detailed questions concerning its evolutionary history and biology. This dinosaur, named Aletopelta coombsi, was originally placed in the Family Nodosauridae, and described as a nodosaur-type ankylosaur commonly known for its narrow head and clubless tail. Unfortunately, no head or tail were found with the Carlsbad ankylosaur, so less definitive characters had to be used to define and describe it. Since the initial diagnosis of the Carlsbad ankylosaur, research has provided science with additional morphological characters to distinguish ankylosaurs, such as the shape and orientation of the dermal scutes (bony armor that grew in the skin of these and other related dinosaurs, such as Stegosaurus). Fortunately, our specimen does have several patches of the dermal "armor" still in place. A re-examination of Aletopelta coombsi suggests that it may be a non-nodosaur-type ankylosaur, placing it in the Family Ankylosauridae that includes animals with bony armor that is still in place.
As global environmental challenges such as climate change and biodiversity loss become more acute, there is a pressing need to promote effective community-based environmental education and conservation initiatives beyond our immediate borders. One way this can be accomplished is by empowering and educating future environmental leaders, while promoting the institutional strengthening of community-based environmental and conservation-focused nonprofits committed to protecting the flora, fauna and critical habitats of some of the world’s mega-biodiversity countries such as Mexico.

Among the 12 mega-biodiversity countries, Mexico ranks 5th in importance as home to 10% of the world’s living species, with well over 65,000 known species and up to 200,000 species believed to exist there. While Mexico’s biodiversity importance is unquestionable, many of the country’s most treasured natural habitats, including some designated as biosphere reserves or marine-protected areas, remain at risk due to the economic development pressures from unplanned or illegal coastal development, illegal fishing, and urban growth.

Fortunately, thanks to a committed community of U.S.-based donors—working through the National City, California-based International Community Foundation—critical eco-regions along the Baja California peninsula and the Gulf of California have a fighting chance of being conserved before it’s too late.

Through its grant-making the ICF supports many worthy environmental and conservation-focused nonprofits that are collectively working to protect and preserve Mexico’s rich biodiversity. Along the Baja California peninsula, environmental nonprofits supported by the foundation include: Pronatura Noreste, Niparaja, Costa Salvaje, CEMDA, Defensa Ambiental del Noroeste, Terra Peninsular, Eco Alianza de Loreto, La Paz Coastkeeper and Vigilantes de Bahía Magdalena, A.C.

The ICF has been an ongoing supporter of a unique binational environmental education program originating at the San Diego Natural History Museum, Projecto Bio-Regional de Educación Ambiental (PROBEA). Among the ICF’s environmentally focused nonprofit grantees, PROBEA is the only one solely focused on environmental education, with an emphasis on both the California-Baja California border and the Gulf of California—two eco-regions of critical importance to the foundation.

Over the past 16 years, PROBEA has had a proven track record in providing environmental science education for teachers and grassroots community workers along the entire stretch of the Baja California peninsula, providing teacher training to over 4200 teachers and volunteers. This has translated into the potential of over 80,000 students involved in environmental education and conservation initiatives in the region.
Kyoto Prize Laureates and Local Educators Hear Kyoto Prize Laureates and Evolutionary Biologists Speak

Drs. Peter and Rosemary Grant, preeminent evolutionary biologists from Princeton and giants in the field of evolutionary biology, spoke to nearly 300 San Diego K–12 educators and invited guests at the San Diego Natural History Museum in April. At the lecture, each attendee received a gift bag including two excellent books, *The Beak of the Finch* by Jonathan Weiner and *How and Why Species Multiply* by Peter and Rosemary Grant. The Grants signed every book from every teacher who requested. The Sefton Atrium was filled with excited and inspired teachers—networking and exchanging ideas. As Executive Director of the Kyoto Symposium Richard H. Davis noted, “[This] program resulted in more ‘leveraging’ of Kyoto Prize education than any other single event that we know—in San Diego or Kyoto.”

The Grants were in San Diego to receive the latest Kyoto Prize in “Basic Sciences.” Their discoveries of rapid evolution caused by natural selection represent the most famous ongoing field work in evolutionary biology. The San Diego Natural History Museum is proud to be a part of the Kyoto Prize Symposium—an extraordinary celebration showcasing the laureates of the Kyoto Prize, Japan’s highest private award for global achievement. This annual event provides invaluable opportunities to appreciate some of the world’s greatest thinkers and creative masters in technology, science, and the arts.

To learn more about the Kyoto Laureate Prize, visit www.kyotoprinze.org.

Among the 12 mega-biodiversity countries, Mexico ranks 5th in importance

Ph.D., Director of BRCC and Curator of Entomology, introduced the Grants. Joining educators in the audience were several VIPs from the Kyoto Symposium Organization and The Inamori Foundation, founders of the Kyoto Laureate Prize. This enlightening event was sponsored by the James Hervey Johnson Charitable Education Trust and Stephen Cohen and Dr. Adele Rabin, with generous in-kind support from Culinary Concepts.

Thanks in part to the funding from the ICF, PROBEA has been able to expand environmental education outreach at Tijuana’s only outdoor environmental education center, Ecoparque, and develop three diverse curricula for over 630 educators in La Paz, Baja California Sur, focused on marine science, backyard habitats, and the state’s rich natural heritages, benefiting over 18,000 students annually. The ICF has also supported PROBEA’s ongoing environmental education efforts along the California-Baja California border with an emphasis on promoting water conservation and stewardship of the vital natural resources of the Tijuana River watershed.

The conservation and environmental education-specific progress made to date by the ICF along the Baja California peninsula would, of course, not have been possible without the steadfast dedication and financial support of its growing base of donors and supporters that are frequent travelers to the Baja region, and who are committed to the long-term protection of some of the peninsula’s most treasured natural habitats, as well as promoting a future generation of local environmental leaders to be responsible stewards of one of the planet’s most unique bio-diverse regions, our Ocean Oasis.

Richard Kiy has been President and CEO of the International Community Foundation since 2001. With a background in international environmental policy he has served as the U.S. Embassy-Mexico’s Acting Environmental Attaché and Special Assistant for U.S.-Mexico Border Affairs at the U.S. Environmental Protection Agency’s Office of International Activities. He serves on the San Diego Natural History Museum’s Binational Advisory Committee.

Richard Schwenkmeyer, a retired biology professor and 66-year Museum volunteer, welcomed his fellow educators to the event. Michael Wall,
Sustainable Planet: Children and Nature

One resource rises above all others as we contemplate the future of our planet—our children. This year, Sustainable Planet will focus on the relationship between children and nature. This could be one of the most important series of lectures ever presented at the San Diego Natural History Museum.

Drawing Inspiration from Art & Nature

Wildlife Artist Robert Bateman
September 4, 2010; 4–5:30 PM

Connecting San Diego’s Kids to Nearby Nature

Panel Discussion
October 5, 2010; 6:30–8 PM

Nature in Human Development: From Childhood Maturation to Design of the Built Environment

Stephen Kellert, Yale School of Forestry
November 9, 2010; 6:30–8 PM

Grounding Learning in Place and Community

Greg Smith, Lewis & Clark College
January 25, 2011; 6:30–8 PM

A Good Place to Grow Up is Green

March 8, 2011; 6:30–8 PM

Louise Chalwa, University of Colorado

Go Behind Closed Doors!

Take a fascinating journey behind the scenes of the San Diego Natural History Museum. Join us for the 136th Annual Meeting of the Museum and enjoy a special evening as we open up our vast collections of natural history specimens. Members will also get a chance to preview the exhibition, Lizards & Snakes: Alive! October 15, 2010, 6–9 PM

Give the Gift of Membership!

Give the perfect gift—membership to the San Diego Natural History Museum! Membership includes free admission to the Museum, unlimited admission to 3D films, 10% discount at the Museum Store and the Dinosaur Café. Your gift includes a personalized message and gift wrap. Call 619.255.0275 to order.
climaxed and may have scavenged on the ankylosaur itself, assisting in the scattered arrangement of the partial skeleton. A large mudstone block containing the pelvic bones, hind limbs, and bony sacral shield of Aletopelta coombsi is on display in the museum’s fossil mysteries exhibition.

While all of the southern-California dinosaurs were collected from shallow marine sedimentary deposits, this does not indicate whether the dinosaurs were frillicting in the water themselves. It does indicate that portions of southern California were under water during the late Cretaceous and that dinosaurs inhabited the nearby North American coastline and lived close enough to the shore that their bodies were readily washed out to sea, to be eventually buried and preserved within the ocean floor sediments.

Although the dinosaur record of the West Coast of North America is a meager one, much can be learned from it. Each and every dinosaur bone that is discovered is a significant find and brings along with it a tremendous amount of information, offering clues about the tropical ocean that once covered our region, the animals that swam in its waters and scattered across its muddy floor, and finally, the animals that ruled the adjacent hot and humid continent to the east.

The San Diego natural history museum’s department of paleontology is proud to be the stewards for this important research collection, as well as the voice for these fossils that tell such a tale. In the exhibition: dinosaurs: ancient fossils, new discoveries, on display through september 6 at the museum, visitors will learn more about how dinosaurs lived and interacted during the “age of the reptiles.”

References:

Volunteer News

Lorraine Sundberg Receives the Friends of Balboa Park Millennium Award

Lorraine Sundberg, San Diego natural history museum’s curator of dinosaur paleontology since 2003, was honored by the mingei international museum at the ninth annual friends of balboa park luncheon. Lorraine began her volunteering career in san diego 50 years ago. She has also volunteered at the san diego museum of art, san diego museum of man, the museum of natural history, and the san diego maritime museum.

Volunteer Spotlight: Bill Howell

Bill Howell joined the museum’s canyoneer program in 1983 while still teaching high school biology in san diego. Within two years, Bill was teaching the class for new canyoneers. In 1992, Bill became a member of the san diego natural history museum and has been a member ever since. He learned about the canyoneers through an article in the daily californian. He joined the group, overconfident in his knowledge and found himself humbled and thrilled to be learning so much. The next year he became president.

Over the course of his volunteerism, Bill has taught hundreds of people the wonders of nature. A citizen-naturalist of the highest order, Bill is a model volunteer whose infectious enthusiasm inspires others.

For more information about the canyoneers, including a current hike schedule and information about becoming a canyoneer, visit sdnhm.org/canyoneers.
Celebrate Wildflower Season All Year!


Calendars just arrived and are ready for picking in the Alex & Elizabeth Wise Museum Store at the San Diego Natural History Museum ($13.99). Order yours today: 619.255.0239 or www.sdnhm.org/store