

THE MVZ BULLETIN



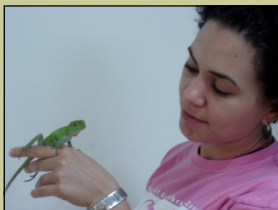
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From the Director

Despite continuing challenges posed by recent, draconian (28%) cuts to our State budget, the MVZ's program of research, teaching, and outreach relating to vertebrate diversity continues to prosper. This says a lot about the dedication and extraordinary efforts of our faculty, staff, and wonderful students – let me thank you all publicly! Recent achievements include:

Outstanding success at the 2010 meeting of the American Ornithologists Union.

MVZ Faculty member Stephen Beissinger received the AOU's premier William Brewster Memorial Award. At the same meeting two other MVZers received awards: Dustin Rubenstein won the Young Investigator Award, and Peter Epanchin won for the best paper in Conservation Biology.

A continuing flow of high quality publications.

MVZers have published over 50 peer-reviewed papers since our last newsletter; see the back page of this issue for a few examples. Of special note is the publication of "Biogeography, Changing Climates, and Niche Evolution," a special volume of the Proceedings of the National Academy of Sciences (PNAS Vol 106, suppl. 2, 19631-19742) edited by David Wake, Liz Hadly, and David Ackerly and featuring 6 papers from MVZers (see p. 8 for more). Also of note are two publications highlighting the careers of our most distinguished herpetologists, David Wake and Bob Stebbins. In the 2009 issue of the Annual Review of Ecology, Evolution, and Systematics, David Wake reflects on insights from a career studying everything you can imagine knowing about salamanders (Ann. Rev. Ecol. Syst. 40:333-352). And we're blessed with another wonderful book from Bob Stebbins (yes, another at age 95!), "Connecting with Nature: A Naturalists Perspective." Finally, I would be remiss in not mentioning Tony Barnosky's wonderful book, "Heatstroke: Nature in the Age of Global Warming."

Grasping the opportunity provided by new DNA sequencing technologies.

The MVZ has always led the field in creative use of new analytical tools. The latest incarnation, led by our inspiring students and postdocs, is to explore how new parallel sequencing technology can revolutionize our ability to explore vertebrate diversity. Experiments underway include applications to understanding transcription differences in the brain of social vs. solitary rodents, phylogenomics of multiple taxa, gene exchange in hybrid zones, and genome-scale analysis of skins from the collection. Watch this space....

Looking forward, our ability to sustain this quality program will depend on success in building resources and endowments to protect us against continuing decline in support from the State. The MVZ Centennial Campaign aims to double our endowment in order to protect the collections and to support research and education at all levels. Our first-ever annual campaign elicited a wonderful and generous response from alumni, faculty, staff and friends and we look forward to the same in 2010. Recently we have been focusing on opportunities such as campus matching programs, targeting gifts from recent alums (p.3), and graduate support. Regarding the latter, I'm pleased to announce establishment of a new "Alden Miller" endowment to support graduate students, especially (but not exclusively) international students. I thank (once again) Jim and Carol Patton for their generosity in establishing this endowment and encourage current or retired faculty and staff (or their surviving spouses) to contribute, as these donations will also be matched by campus.

So, challenges abound – but so do opportunities. Let's get on with it.

Craig Moritz

SKELETONS IN THE BASEMENT- A PREP LAB PRIMER

Sometimes you can get a whiff of the prep lab from down the hall. On a bad day the laboratory's signature bouquet hits you like a slap in the face as you walk in the door. While not necessarily normal, this olfactory assault happens frequently enough that people familiar with the lab - undergraduate volunteers and museum scientists - laugh and remark, "Whew! I wonder what it is this time?"

Located on the first floor of the Valley Life Sciences Building, the prep lab is an unusual place. While it is not a laboratory in the research sense - experiments for publication purposes rarely happen here - it is nonetheless an integral part of the museum's operations. Led by Monica Albe (recent recipient of the Chancellor's Outstanding Service Award), the prep lab is the first stop for many specimens destined for the MVZ collection. Think of it as the workshop of *vertebrate zoology*, complete with power tools and hand-saws.

A quick stop into the prep lab, however, is not for the faint hearted. Even if you can brave the offensive smell, one glance into the room reveals a chaotic, macabre scene. In one corner, drying corpses of skinned birds and mammals hang from a fume hood. In another corner, flesh eating beetles enjoy a meal. Just about every bit of counter and shelf space houses skeleton-boxes, buckets of animal parts, or stacks of field specimens that resemble nothing so much as mouse-jerky. The lab currently has over 1,300 skeletal specimens in some stage of cleaning, and over 3,000 frozen carcasses waiting to be prepared in the freezer. "It's a highly organized type of chaos," Monica likes to say. And despite first impressions, this is true. In 2009, with the help of MVZ undergraduates, this lab prepared 950 specimens out of the freezer, and cleaned over 2,000 skeletons through the beetle colony -- a mind-blowing amount considering how involved the "processing" process is.

So what does it mean to process a specimen? Surprisingly, quite a lot. Aside from recording data on each animal (an entire bookkeeping project in itself), Monica and her group of undergraduates take specimens from full-fleshed corpse to shiny-clean skeleton, fit for a permanent home in the MVZ collection, typically in as little as a few weeks. "It can take much, much longer, though," warns Monica.

Apparently, making clean white bones out of recently dead animals can take years in nature. The prep lab process, even at its longest, shortens this turn-around time, and believe it or not, reduces the stench. It also gathers invaluable data like tissue samples, weight, body measurements, and stomach contents for each specimen.

How does this happen? "Much of it is done using nature against itself," laughs one of the undergraduates. "After we skin and dissect a specimen, we dry it out and put it into the bug colony. The bugs eat off most of the flesh, usually, but they can be picky, too." According to Monica, "The bugs will only eat certain kinds of flesh; no skin, no internal organs, no really rotten stuff, and they prefer some animals to others." Flesh eating bugs have a discerning palate? "Yeah, they really don't like seabirds," says Monica.



So the specimens spend anywhere from several days to a couple of weeks in the bug colony, and when they emerge they are (ideally) pretty well de-fleshed, but not nearly finished. There are usually still bits and pieces of connective tissue on the bones, a good bit of marrow in the bones, and very often they're greasy. Yes, just like chicken. Although the specimen has now been reduced to a skeleton, there is still more to the process. In their present condition, the bones would rot, smell, and attract pests if they were sent to the MVZ's collection. The next several steps, and weeks, are dedicated to the slow and meticulous processes of further cleaning those bones.

The first of these steps is to macerate the skeleton. This involves letting the bones soak in water, which allows bacteria to accumulate and eat away at whatever soft-tissue may be left. Many of the large bones, like the limbs, are drilled with holes to allow bacteria into the marrow cavity. The cranium is not included in this step, as extended soaking makes teeth fall out. Instead, the cranium is carefully labeled and set aside.

After spending weeks, or even months, as a feeding ground for bacteria, a much cleaner skeleton emerges. At this point the cranium and skeleton are reunited and both are soaked in ammonia and then water for a few days. Finally, the dirty work is almost done.

The final step before a skeleton can be boxed and sent to the collection is often the most painstaking. Each skeleton must be examined carefully for any remaining tissue, which must be removed by hand. This delicate, meticulous work, usually carried out by the dedicated undergraduate apprentices, ensures that there is no soft-tissue left to decay in the collections.

After a day or two of drying the skeleton can be placed in a labeled box, identified as finished in the Prep Lab database, and sent to the collection. The final product is a clean, research-worthy skeleton.

Many specimens housed in the MVZ bird and mammal collections began their journey in MVZ prep lab. The work that happens here is a crucial part of the museum's curatorial operations. In addition, it offers hands-on experience in zoology and anatomy to students and researchers alike.

NEW ALUMNI CHALLENGE



Calling all undergrad and graduate alumni and graduating students!

The MVZ needs you!

In Fall 2009, the trustees of the UC Berkeley Foundation launched the New Alumni Challenge Campaign.

All undergraduate and graduate alumni from the classes of 2005 through 2009 AND undergraduate and graduate students who graduate in spring 2010 are eligible to have their **donations to the museum matched 3:1** by the Trustees.

The New Alumni Challenge invites all undergraduate and graduate alumni from the Classes of 2005 through 2009 and spring graduates to participate in **this first-ever match that quadruples all contributions up to \$1,000**. A donation of \$25 will equal \$100, while \$1,000 will increase to \$4,000! Every single gift, up to \$1,000, will be matched. Your gift to the Museum will help preserve the vital programs that directly strengthen the MVZ. Multiple gifts are welcomed.

Times are tough for everyone, so this is a great way to **make even a small gift go a long way**. Please consider a gift to the Museum and help us remain at the forefront of international research on evolutionary biology!

To make your gift to the Museum, please visit
<http://campaign.berkeley.edu/new-alumni-challenge/> and search on *Museum of Vertebrate Zoology*.

*Please note: Only gifts from new alumni will be matched
but gifts from all constituencies are needed and appreciated.*

HONOR SOMEONE SPECIAL

Did you have a favorite professor while at the MVZ?

Was there someone special at the MVZ who helped you achieve your research goals?

Consider honoring that special person by making
a gift in honor of _____.

We'll notify the honoree of your gift but will not disclose the gift amount.

On the online gift form,
please type your honor message in
the special instructions box provided.

GRADUATE FELLOWSHIPS BRIDGES LAB WORK AND FIELD STUDY

Fellowships play a vital role in supporting graduate students' field research, and for contributing to collaborations with other researchers from around the globe. Fellowships are essential to expand our knowledge of the biological sciences and to remain at the forefront of international research on evolutionary biology. Through the use of the Museum's collections and important field research **our graduate students are leading the way in solving global problems in biodiversity conservation and expanding our knowledge of the natural world.**

The Museum of Vertebrate Zoology's graduate program is among the finest in the country, but in order to compete effectively for the best students we must enlarge our endowed funds for graduate fellowships – especially in light of recent graduate fee increases. With your financial support we can continue to cultivate tomorrow's scientific leaders and expand our knowledge of the biological sciences.

Graduate alumni **Chris Clark** works on the biomechanics and evolution of animal flight. He uses a combination of field and laboratory methods to study flight performance in hummingbirds. Birds are well known for their prodigious vocal abilities, but the ways in which they produce non-vocal sounds are poorly understood. His research indicates that the 'bee' hummingbirds produce sounds with their tail-feathers. This research has uncovered a widespread mechanism of communication in birds, and understanding the physics of how these sounds are produced may result in the invention of new devices.

In January, Chris Clark, along with MVZ researchers Teresa Feo and Doug Altshuler, were featured on the PBS Nature series, *Hummingbirds: Magic in the Air*. Watch the video to learn more about their research: <http://www.pbs.org/wnet/nature/>

While a graduate student, Chris received the MVZ's Louise Kellogg Fund fellowship enabling him to buy essential supplies, conduct important field research, and contribute



Chris took this photo of diving hummingbirds during the course of his research. He received his Ph.D. in May 2009 and is now a Post-doctoral Fellow at Yale's Peabody Museum of Natural History.

specimens to our bird collection. **The Louise Kellogg Fund**, established in 1970 to enhance the Museum's collections, honors the importance of naturalist Louise Kellogg's work. Kellogg explored the West from Alaska to the tip of Baja California for more than half a century collecting specimens for the University's natural history museums.

We invite you to make a gift that will provide crucial funding for more of the MVZ's exceptional graduate students ensuring the Museum continues to **lead the way in research for the benefit of California and the world.**

To make a gift supporting MVZ's graduate research, please visit <http://givetocal.berkeley.edu/> and search on *Museum of Vertebrate Zoology*, type *fellowships* in the box provided. Thank you for your support!



ARDI RECONSTRUCTED

Human Evolution Research Center director (and MVZ Faculty Associate), Tim White, is co-director of the Middle Awash Project. This team of researchers recently revealed their reconstruction of a partial skeleton of the hominid, *Ardipithecus ramidus*. The team's reconstruction of the 4-foot-tall skeleton and of Ardi's environment revolutionizes our understanding of the earliest phase of human evolution. The team includes MVZ Faculty Associate and HERC Faculty member [Leslea Hlusko](#).

The Middle Awash Project published the results of their analysis in 11 papers in the Oct. 2 issue of the journal *Science*.

HERC's research is featured in an exhibit on the second floor of the Valley Life Sciences Building at UC Berkeley. There is a new section of the exhibit about *Ardipithecus ramidus*.

A SPECIAL VISIT FROM ROBERT STEBBINS

Former colleagues and students of Bob Stebbins filled the MVZ on Monday, September 14th as they celebrated the herpetologist's long career and his many accomplishments. Bob Stebbins moved to Eugene, Oregon at the end of September, after an impressive 64 years of working with the museum.

Born on March 31, 1915 and raised on a ranch, Stebbins grew up with an appreciation for nature. His father was a biologist, agriculturalist, and evolutionist and his mother was a fundamentalist Christian and artist. From his parents' involvement, Stebbins molded his own interest in biology and nature.

As a student at the University of California, Los Angeles, Stebbins initially enrolled as a civil engineering major. His interests lead him to switch to zoology, in which he graduated with top honors. Stebbins' Ph.D. work initially focused on birds, but his work with Professor Raymond B. Cowles, who was studying the body temperatures of snakes and lizards, caused Stebbins to turn his attentions toward herpetology.

In 1945, Bob Stebbins began his work as the Assistant Curator in Herpetology at the MVZ. As a curator in the museum's Young Herpetology Program, Stebbins adopted the Grinnell-Miller style of fieldwork and note-taking and standardized the preservation methods of amphibians and reptiles. Stebbins' accomplishments also extended beyond the museum. While serving as curator, he created a hands-on curriculum for the Natural History and Herpetology courses in UC Berkeley's Integrative Biology department and published many studies concerning salamander natural history, locomotion, reproduction, systematics, and regulatory processes.

Stebbins' contributions will continue to have a lasting impact on generations of scientists and young people. He encouraged the improvement of science education in elementary schools and acted as the major advisor for 29 stu-



dents. He is renowned for the writing of Peterson's *A Field Guide to Western Reptiles and Amphibians*, which he also completely illustrated. Most resounding, however, may be his involvement with efforts to protect Californian deserts from destruction by off-road vehicles, which damage delicate habitats. His activism contributed to the creation of the East Mojave National Scenic Area, Death Valley and Joshua Tree National Parks.

Considering Bob Stebbins' lasting legacy, it is no surprise that such a large crowd gathered to commemorate his life and career. Although Stebbins is no longer frequenting its halls, his lifetime of work will remain an integral part of the museum.

MVZ ALUMNI NEWS

- **Molly Gleeson**, BS 2009, is finishing her first year at UC Davis, School of Veterinary Medicine.
- **Kristin Ruegg**, PhD 2007, is a Postdoctoral Researcher at Hopkins Marine Station, Stanford University.
- **Ulf Johansson**, Postdoctoral Researcher 2007, is Curator of Birds and Mammals at the Swedish Museum of Natural History. He was part of a team that discovered a new species of warbler in Vietnam in January, 2010.
- **Madeline Tiew**, BS 2009, leaves for Senegal this month as a Peace Corps volunteer. As part of the Preventative Health and Environmental Education program, she will be working with the schools and community as an Environmental Education agent to help with issues of water quality, sanitation, waste management.

SEND US YOUR NEWS! Keep us posted on events in your life, and with your current contact information, by sending an email to mvznews@berkeley.edu

MEET THE MORITZ LAB

The Moritz Lab's research centers on the use of molecular approaches combined with evidence on phenotypes and geographic distributions derived from fieldwork to study ecological and evolutionary dynamics of diversity. Research emphases include; (1) Understanding the effects of past climate change on biotas to improve prediction of current patterns of genetic, phenotypic and species diversity, especially in rainforests; (2) Developing creative ways of using high quality and extensive museum collections, such as the MVZ's, to document and understand responses to recent climate change and, thus, to improve forecasts of future dynamics; and (3) Developing strategies for conservation that recognize and sustain evolutionary processes in the face of rapid global change. Our core study systems include the tropical rainforests of northern Australia and of eastern Brazil, and the diverse ecosystems of California. Our approaches are deliberately comparative, seeking to understand how fauna with diverse ecological requirements and varying potential for dispersal respond to a common history of environmental change. Typically, we combine spatial modeling of geographic ranges of species or their habitats, under present and past climates, with analyses of phylogenetic, molecular and phenotypic variation. Our research also stimulates collaboration with theoreticians interested in developing better tools for inferring past population and community dynamics from comparative data. Though we tend to focus on vertebrates, especially reptiles and amphibians, any species with relevant geographic range and DNA is fair game!



Cophixalus exiguus

HISTORICAL DEMOGRAPHY AND SPECIATION OF MONTANE MICROHYLID FROGS (GENUS *COPHIXALUS*) WITH RESPECT TO CLIMATE CHANGE

I study the evolutionary history of montane *Cophixalus* species, endemic to the Australian Wet Tropics, with respect to past climate change. Using paleoclimate modelling and physiological data I generate hypotheses of late Quaternary distributions of these frogs. Then I use multilocus sequence data to address the following questions: (1) Did montane species fluctuate in population size as predicted by paleomodels? (2) Is there evidence of introgression among montane endemics due to range contact during colder and wetter periods (eg. early Holocene)? (3) Is long-term allopatry the primary mode of diversification for these lineages, or could some have diversified by budding-off (peripatry) from widespread taxa? — **Charlotte Jennings**

RECOVERING THE HISTORY OF MAMMALIAN BIODIVERSITY

My research relies on extensive field collections and an integration of molecular and computational approaches to understand the factors shaping the diversification and spatial distribution of mammalian biodiversity. My main study systems include (1) phylogeography of rodents in glaciated regions of North America, (2) systematics of Australasian rodents, (3) pheromone and genome evolution in *Rattus*, and (4) the Grinnell Resurvey Project that compares historic MVZ collections to modern surveys in California to understand how the distributions of species have responded to the last 100 years of climate and landscape change. — **Kevin Rowe**



Kevin Rowe surveying small mammals in the southern Sierra Nevada Mountains in 2009 at a site first surveyed by Joseph Grinnell in 1911.



Maria in the field, Summer 2009

PIPETTE MASTER

Maria received her Masters in Conservation Biology from SF State in 2007 and has been working with Craig on many projects as his lab technician. Her research interests involve evolutionary biogeography, population genetics, and conservation genetics. She really enjoys working with and helping the undergraduates in Craig's lab. She also teaches biology at Skyline Community College, — **Maria Tonione**

MEET THE MORITZ LAB

LEARNING FROM THE PAST AND ACTING IN THE PRESENT: HISTORICAL AND CONTEMPORARY HABITAT FRAGMENTATION IN THE BRAZILIAN ATLANTIC FOREST

How did Quaternary climatic oscillations affect the Brazilian Atlantic forest? How did the terrestrial fauna respond to such changes? What can we learn from historical events and apply to contemporary problems? What mechanisms are involved in responses to environmental change? Roberta Damasceno is interested in integrative approaches to inform conservation decisions. Roberta investigates how habitat stability (presence of forest stable areas through Late Quaternary) and landscape changes (human-driven habitat loss and fragmentation) shape genetic diversity, genetic structure, and thermal biology of four widespread species of lizards and lizard community composition in the Brazilian Atlantic Forest. Her research involves extensive fieldwork in Brazil, visits to museums of natural history, physiology experiments, and lab work in molecular genetics.

— **Roberta Damasceno**



The leaf-litter skink, Saproscincus lewisi -- one of the 4 species that is part of Sonal's research

A WINDOW INTO TROPICAL SPECIATION

One way to understand how species form is to investigate hybridizing species. By determining both the patterns and consequences of hybridization, we can better understand what keeps species apart. Sonal Singhal, a third-year graduate student, studies a unique hybrid zone in the Australian tropics. Here, four species of lizards form overlapping hybrid zones, allowing Sonal to take a comparative look at hybridization. In particular, Sonal employs genomic methods to characterize the dynamics of these hybridizing species.

— **Sonal Singhal**



Enyalius catenatus, a characteristic lizard from the Brazilian Atlantic Forest, is very sensitive to temperatures

ECOLOGICAL FORTUNETELLING

Adam joined the MVZ this past fall and is working with historic data collected by Joseph Grinnell in the early 1900s and by colleagues in contemporary times. His primary research is an evaluation of the reliability of models that predict the extent of species' ranges given environmental conditions in areas where the species inhabit, and see to how well models developed for historic data predict ranges in the present. This research will serve as a guide for conservation biologists who want to predict the status of species in the future in light of global change. — **Adam Smith**



Adam censusing serpentine plant species for his Ph.D. work



Roberta Damasceno, Craig Moritz, and Ana Carnaval taking a break from field work in Bahia, Brazil. Photo by Agustin Camacho

IMPROVING BIODIVERSITY PREDICTION AND PROTECTION IN THE TROPICS

As a postdoc in the Moritz lab, I use the tools of distribution modeling and comparative phylogeography to study how natural populations have responded to former climates. The explicit aim of my research, which is done in collaboration with several Latin American and US institutions, is to support biodiversity prediction and to forecast the dynamics of population responses to human-induced environmental change. My projects are centered in highly diverse tropical areas of the world, with a special focus on the herpetofauna of the Atlantic rainforest in my home country, Brazil. They combine extensive field work with molecular data analysis in the MVZ. — **Ana Carnaval**

For a Press Release on our recent findings in Brazil, check out http://berkeley.edu/news/media/releases/2009/02/05_atlanticforests.html

STUDYING SPECIES FORMATION IN REAL TIME

The salamander *Ensatina eschscholtzii* is distributed around the Californian Central Valley, where populations meet at different stages of the divergence process. Taking advantage of this natural experiment, as a graduate student in Moritz and Wake labs, I am using population genetics tools to study naturally-occurring hybrid zones. In contrast to lab-based studies, we find that hybridization is very common during the divergence process and leads to stable populations. Rather than time in geographic isolation, local adaptation seems to play an important role in maintaining differences between closely related populations and, therefore, the formation of new species. — **Ricardo Pereira**



Hybrid *Ensatina* salamander discussing species with Ricardo Pereira.



Morelli in the eastern Sierra Nevada

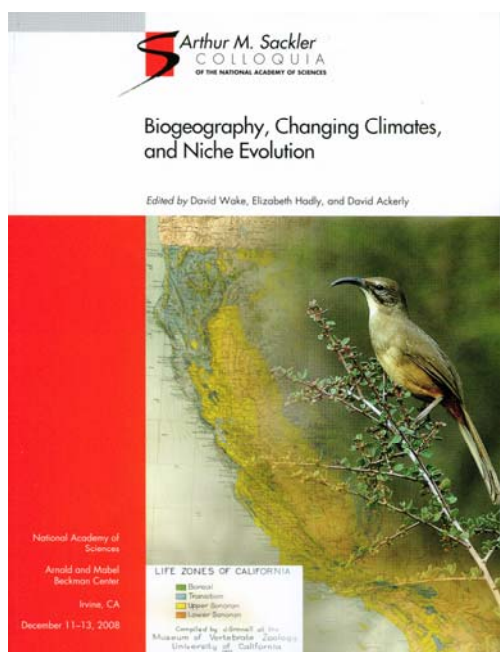
USING LANDSCAPE GENETICS TO UNDERSTAND THE EFFECT OF ENVIRONMENTAL CHANGE ON CALIFORNIA MAMMALS

Postdoctoral Fellow, Toni Lyn Morelli, has previously studied the ecology and behavior of African mammals, including work on lemurs in Madagascar. She is now beginning a project to determine the effect of landscape and climate features on the distribution and diversity of populations, working as part of the Grinnell Resurvey Project team. She will conduct a phylogeographic analysis of rodents in and around Yosemite National Park, using GIS, genetics, and species distribution modeling to explore source-sink dynamics and to identify potential climate change refugia. This work is part of her recently awarded National Science Foundation Bioinformatics Postdoctoral Fellowship.

— **Toni Lynn Morelli**

For information on Moritz lab member, **Thomas Devitt**, see our 2008 issue profiling the McGuire Lab, in which he is also a member.

PNAS PUBLICATION FEATURES GRINNELL'S LEGACY MAP



Supplement to the *Proceedings of the National Academy of Sciences of the United States of America*, which includes articles from the Arthur M. Sackler Colloquium of the National Academy of Sciences *Biogeography, Changing Climates, and Niche Evolution*. The complete program is available on the NAS web site at www.nasonline.org/sackler_biogeography.

Cover image (left): The cover illustration depicts the 1933 map that Joseph Grinnell compiled to illustrate the Life Zones of California and a photograph of the California Thrasher. Grinnell's concept of the ecological niche was developed from studies of California vertebrates, specifically the California Thrasher (*Toxostoma redivivum*), and the map was an early effort to integrate natural history with geography in understanding biogeography. The map illustration is courtesy of Michelle Koo (Museum of Vertebrate Zoology) and the California Thrasher photo is by Steve Dowlan.

UNDERGRADUATE PROFILE: MINGNA (VICKY) ZHUANG

How and when did you first get involved with the MVZ?

I got involved with the MVZ in the spring semester of my sophomore year through the Undergraduate Research Apprentice Program (URAP). I was really excited to hear that there was a job that would allow me to actually see what was inside the museum.

Where in the MVZ do you work? What specific duties are you entrusted?

I work in the Herpetology department with Carol Spencer as a curatorial assistant. This means that I do a variety of tasks to upkeep the herp collection like checking ethanol percentages, tying tags, labeling jars and making database entries. This semester though, I have a big accession project that makes up most of my work. We're entering a whole bunch of *Batrachoseps* into Arctos and that is going to take awhile so it's a good test of endurance.

What do you find rewarding about your work?

It's really great whenever I get to learn anything new about a species or techniques for prepping specimens. It's really exciting getting to listen to any of the researchers talk about the places they've gone and the herps they've seen.

What do you hope to gain from your volunteer experience?

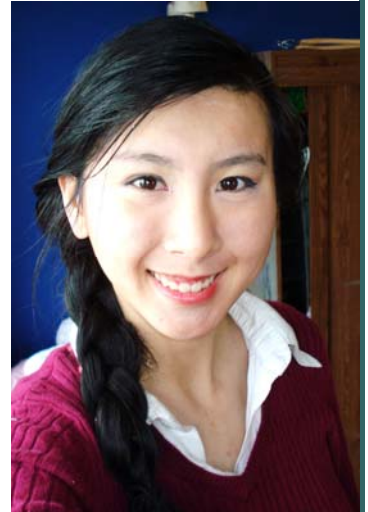
I just really hope to learn more and hopefully get opportunities to see more live herps, meet more scientists and go into the field to learn more about biological research.

What are your favorite MVZ memories?

Cal Day last year was a lot of fun. It was really hectic trying to get everything prepared in time but in the end it was great to see so many exhibits, especially from the other departments of the museum. The afterparty was even more fun just because we got to exchange what kind of questions were asked of us by visitors. (e.g., Is it alive?)

Does your volunteer work tie in in anyway with your personal interests or hobbies?

I'm really interested in zoology overall, especially the physiology and animal behavior aspects. The great thing about the MVZ is that we're surrounded by a humongous collection and reprint library, and awesome people who know just about everything to do with it.



FROM THE MVZ ARCHIVES...

Three yellowing sheets of paper and a grainy black-and-white photograph in the MVZ archives are all the remaining evidence of a strange event that occurred over 50 years ago. In a letter dated March 28, 1950, Lloyd A. Cable, President of the Chamber received an interesting request of the Museum and learned a little more about the ocean's mysteries.

According to Cable, an unidentified "sea creature" was discovered on the beach of DeLake the morning of March 3. The beast's body, as he described, was about fourteen feet in circumference and four to five feet in length. The creature was ornamented with a "flat long string" on one side and short hair on the other. Stemming from the base were five "tails" of varying length, the longest of which measured sixteen feet long and two feet wide at the base. The body was estimated to have weighed between 1500 and 2000 pounds.

The flesh of the creature also had interesting characteristics, aside from sheer size and bizarre appearance. Even after three weeks of lying on the beach, the carcass did not decompose and did not emit a smell. Seagulls made no attempt to eat or even approach the remains. In addition, the flesh was incredibly tough; knives and axes were taken to the body, but to no avail. Pieces were finally liberated from the body with a brush knife. When a piece of the flesh was introduced to a flame, it did not burn. The only response was a shriveling effect. So what exactly was this mystery creature from the sea?

In response to Cable's letter to the Museum, the Curator of Mammals Seth B. Benson replied with a letter of his own on April 3, 1950. Although Benson could not offer an exact identification based on the description in the letter and the accompanying photograph, he determined that the "sea creature" on the beach of DeLake, Oregon was most likely the carcass of a giant squid. This rare and exciting event is an example of the fascinating stories that exist in the Museum's archives.

RECENT PUBLICATIONS

Below is a selection of recent MVZ Publications. For a complete list of museum publications, visit our online database. (<http://docubase.berkeley.edu/reprints.html>)

- Cutrera, Ana Paula, Eileen A. Lacey, Matías S. Mora, Enrique P. Lessa. 2010. Effects of Contrasting Demographic Histories on Selection at Major Histocompatibility Complex Loci in Two Sympatric Species of Tuco-Tucos (Rodentia: Ctenomyidae). *Biological Journal of the Linnean Society* 99: 260–277.
- Peery, M. Zachariah, Laurie A. Hall, Anna Sellas, Steven R. Beissinger, Craig Moritz, Martine Be´rube, Martin G. Raphael, S. Kim Nelson, Richard T. Golightly, Laura McFarlane-Tranquilla, Scott Newman, Per J. Palsbøll. 2010. Genetic Analyses of Historic and Modern Marbled Murrelets Suggest Decoupling of Migration and Gene Flow after Habitat Fragmentation. *Proceedings of the Royal Society B* 277: 697–706.
- McGuire, Jenny L. 2010. Geometric Morphometrics of Vole (*Microtus californicus*) Dentition as a New Paleoclimate Proxy: Shape Change Along Geographic and Climatic Clines. *Quaternary International* 212: 198–205.
- Outlaw, Robert K., Gary Voelker, Rauri C.K. Bowie. 2010. Shall We Chat? Evolutionary Relationships in the Genus *Cercomela* (Muscicapidae) and its Relation to *Oenanthe* Reveals Extensive Polyphyly Among Chats Distributed in Africa, India and the Palearctic. *Molecular Phylogenetics and Evolution* 55: 284–292.
- Constable, Heather, Robert Guralnick, John Wieczorek, Carol Spencer, A. Townsend Peterson, The VertNet Steering Committee. 2010. VertNet: A New Model for Biodiversity Data Sharing. *Public Library of Science Biology* 8(2): e1000309.

Spring 2010 Newsletter

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DONOR ROLL 2009

The Museum of Vertebrate Zoology is grateful to the following donors for their generous support received from **January 1, 2009 through January 17, 2010. *Thank you!***

Anonymous Donors

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Judy and Douglas Adams

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Robert Dudley

Emily Duval

Dennis Forsyth & Marcia Flynn

Michelle Frey-Schutters & Jon Schutters

James Havens

Anna Ippolito & Nathan Matsubara

Stephen T. Jones

Tiffany Anne Khong

Michelle Koo

Michael Levine & Lily Mirels

William and Louise Lidicker

Stephen Long & Sharon DeCray

Dale & Yvette McCullough

Matthew McElroy

Jimmy McGuire & Sharon Messenger

Craig Moritz & Fiona Hamer

Rachel Lockridge Mueller

Juliana Karin Olsson

Clare Olivares

Theodore Papenfuss

Carol P. & James L. Patton

Edwin "Phil" Pister

Susanne & Bernard Peyton

Ellen Mary Prager

David O. Ribble

Kristen Ruegg

Shasta Wildlife Conservation Foundation

Neil H. Shubin

Lydia Smith

Carol Spencer

Mark T. Stanback & Nancy Popkin

Patrick Ka-Wai Tam

Pascal Title

Maria Tonione

Ann Trapaga

David & Marvalee Wake

Pamela Williams & Stephen Laymon

Kellie Whittaker & William Fisher

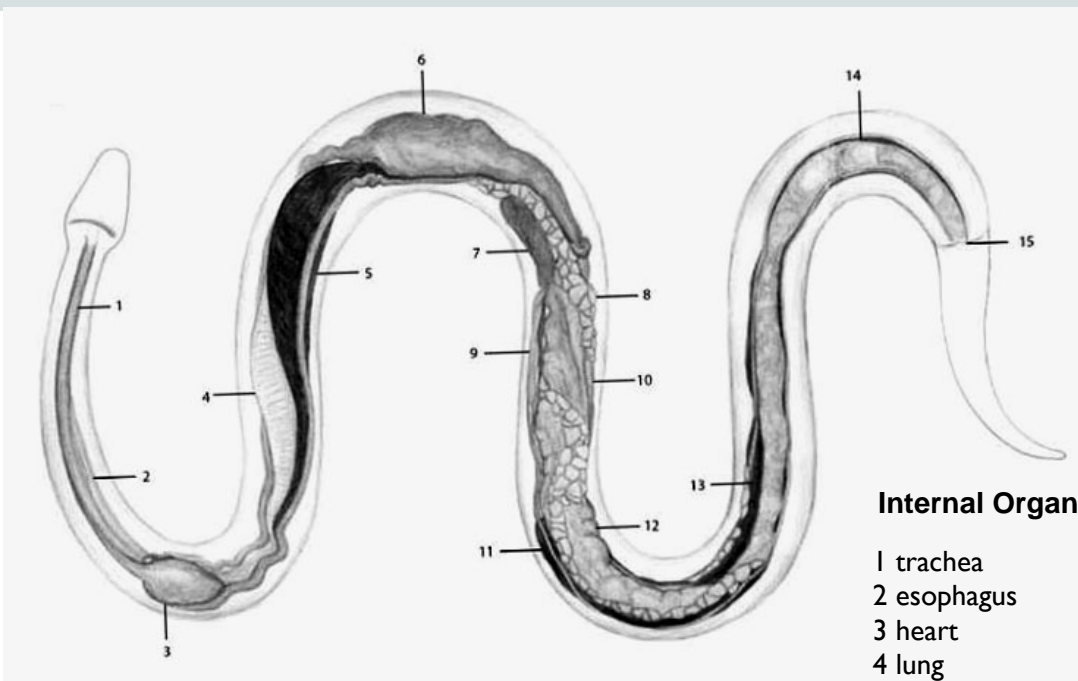
John Wieczorek & Eileen A. Lacey

Larry L. Wolf

The MVZ gives a special thanks to Anand Varma for the use of his beautiful photos in museum communications such as this one. .

FEATURE ILLUSTRATION BY JULIANA OLSSON

Juliana Olsson, a 2009 MVZ alumnus, is currently a scientific illustrator at the California Academy of Sciences.



Internal Organs of the Snake

1 trachea

2 esophagus

3 heart

4 lung

5 liver

6 stomach

7 gall bladder

8 fat bodies

9 testis (R)

10 testis (L)

11 kidney (R)

12 intestine

13 kidney (L)

14 vas deferens

15 vent

NEWS FROM HASTINGS

Hastings Reserve Director Mark Stromberg reports that the **GK-12 Project Online** based in part on K-12 students and graduate students' visits to Hastings has developed an on-line insect identification key, **Berkeley BioKeys**. It's unfinished, since there's currently a lack of funding, but the butterflies and a few other insects are already reasonably complete.

Why counting pollen grains in oak woodlands is so important

Kyle Funk, a research assistant with Walt Koenig, wound down the summer working in the oak woodlands. Walter recently received funding from NSF to explore what controls the apparent synchrony of acorn crops across California. From boom to bust, each year seems to be similar across vast areas of California. Release of oak pollen, both how much and how synchronous, may account for some of the variation in acorns. If the oak flowers don't get pollen, the acorns won't fill out.

Using a unique machine made by Burkhard Manufacturing in England, Kyle was able to gather pollen samples. A large fin on the machine's back kept it pointed into oncoming breezes. Mounted on towers at least 10 feet in the air, a large fan underneath blew air (and pollen) on the rim of an inner wheel. Kyle put sticky tape on the wheel's rim, and could tell which section of the wheel represented each day of the week. By removing the tape, each day's pollen was captured. The pollen was then put on a microscope slide, stained, and examined. Kyle consulted books to learn the various kinds of pollen collected - pine, oak, grass, etc.. He can now distinguish oak pollen, but the various species of oaks are still a challenge. Walt is studying many of the oaks; the common ones at Hastings being coast live oak, valley oak, and blue oak. Walt uses the daily pollen count data to help tease out factors that control the acorn crop. The acorn crop in California is probably the single most influential variable affecting wildlife populations including deer, pigs, and of course, the acorn woodpecker!



JOIN US FOR MVZ LUNCH!



MVZ Lunch (IB 264) is a graduate level seminar series based on current and recent vertebrate research. Graduate students, professors, staff and visiting researchers discuss current and past research projects. The Seminar is open to the public. UC Berkley students can take the seminar for credit as a one-unit course.

MVZ Lunch is every Wednesday from 12- 1pm. Enter through the MVZ's Main Office, 3101 Valley Life Sciences Building. The library is located in the rear of the Museum on the north side.

Visit us on the web for a detailed schedule of speakers.
<http://mvz.berkeley.edu/Seminars.html>