

BACKBONE

NEWSLETTER OF THE DEPARTMENT OF
VERTEBRATE ZOOLOGY
NATIONAL MUSEUM OF NATURAL HISTORY

OCTOBER 2006



VOL. 19, No. 4

Osteoblasts...

Squirrel Natural History

by Richard Thorington, Jr.

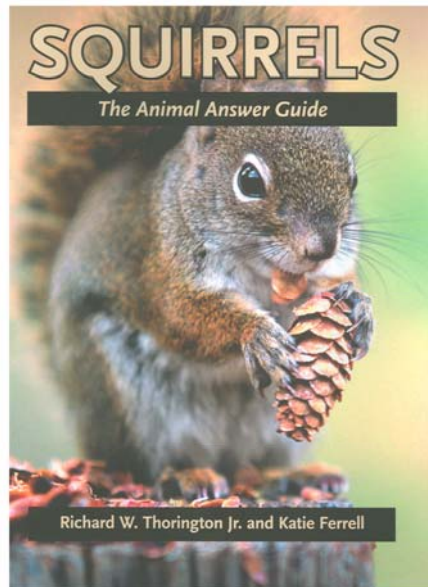
Squirrels constitute a family of rodents containing 278+ species which occur on five continents, excluding only Australia and Antarctica. Because most species are diurnal and easily observed, they have been favored subjects for studies of ecology, behavior, and many other aspects of natural history.

One of the interesting aspects of knowing the natural history of a group of organisms well, is the fascinating interplay between different areas of study. For example, systematics involves history and morphology, morphology reflects function and ecology, and both interplay with behavior.

In June 2006, we received an e-mail request about the occurrence of sun squirrels in the Sudan. A few questions in return elicited the information that there was an outbreak of monkeypox in Darfur. Because monkeypox is closely related to smallpox, epidemiologists are ever interested in the source of the virus. It was first discovered in monkeys, but squirrels in Africa appear to be the major carrier of the virus, and squirrels are a welcomed food source for humans under the current conditions in Darfur. Yes, the Gambian sun squirrel does (or did) occur in Darfur. We know that from the collection made by Kermit

Roosevelt in 1910. Chalk up one for the interplay between systematics, history, human ecology, and epidemiology.

It was this sort of interplay that **KATIE FERRELL** and I wanted to describe in our book *Squirrels: The Animal Answer Guide*. We also wanted to demonstrate the world-wide diversity of the Sciuridae, because so frequently people think of squirrels only with reference to the eastern gray squirrel, in ignorance of the beautiful giant tree squirrels of Asia, the pygmy tree squirrels of three different continents, the magnificent giant flying squirrels of Southeast Asia, and so many others.



As we plowed through the squirrel literature, we found a number of opportunities to incorporate explanations of scientific methods, as well as interesting facts and stories about squirrels. In the

main, however, we sought to introduce our readers to some of the many nuggets that are to be found in natural history, with the constant undercurrent of evolution -- explanations for infanticide among prairie dogs, the correlation between sociality and hibernation in marmots, the differences in squirrel diversity in South America and Africa and the probable reasons for African tree squirrels being more precocial than North American tree squirrels.

Of course, the eastern gray squirrel demands good coverage as well, because it has been studied so frequently -- coat color variation, squirrel migrations,



Smithsonian
National Museum of Natural History

how the squirrels handle rapidly-germinating acorns, how they find buried nuts, etc.

Our observations of local squirrels continue. In the summer of 2005 there was a population crash among the gray squirrels in the Washington area, noticed by many of you. It was probably caused by an inadequate food supply, but it was strangely timed -- August and September. We know one area where the population did not crash -- Lafayette Park, across from the White House, where the squirrels are always well fed.

Another possible explanation for the crash is West Nile Virus, which is known to infect squirrels. The timing would have been good for this, because as Peter Marra and his colleagues have shown robins are carriers and are preferred by some mosquitoes until they complete their nesting, at which time the infected mosquitoes turn to other sources of blood, like humans and squirrels.

In 2006, the squirrel populations are expanding and this is a mast year, with many oaks, beech, and hickory trees producing nuts prolifically. We should ex-

pect well-fed females to produce many litters in the spring, perhaps leading to a surfeit of juvenile squirrels and perhaps even to squirrel "migrations" in the fall, if there is a failure of the nut crops in 2007. Keep watching, and let us know if you see squirrels on the march.

Rich Vari, prepare to guard your birdfeeder! Responding to Rich's request, we must say we know of only one sure way to keep squirrels off of birdfeeders, and that is to put no seed in the feeder. You

will still have the pleasure of watching the frustrated squirrels check your bird-feeder regularly.

Another strategy is to place squirrel feeders in another part of your yard. Stock them with more attractive squirrel foods, like nuts, dried corn, and peanut butter. While the squirrel feeder is full, you will have few problems with them at your bird-feeder, but you will be reminded whenever the squirrel feeder is empty.

You will also be able to watch the squirrels without the distraction of the birds, although Cardinals, Blue Jays, and others may take a liking to the dried corn spilled on the ground by the squirrels. Squirrel watching can be at least as interesting as birdwatching!



Dr. Richard Thorington, Jr., Flying Squirrel, and Katie Ferrell

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Editor Joy Gold

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DEADLINE FOR NEWS

VZ staff will submit news items to
Division Contacts by January 19, 2006.

DEADLINE FOR DIVISION CONTACTS

All news items to Joy
by January 26, 2006
All News items on diskette or e-mail

Editor's Note:-

Thanksgiving and Christmas will soon be here. *Squirrels: The Animal Answer Guide*, published by the Johns Hopkins University Press, Baltimore would make a great gift and now is conveniently available from the NMNH bookstore. It can also be obtained from your favorite outlets on the computer. Dick Thorington will be happy to autograph a copy for you.

VZ NEWS

KUDOS TO OUR AFFILIATES

BOB REYNOLDS, NEAL WOODMAN, MERCEDES FOSTER, ROGER CLAPP, and SUZY PEURACH presented posters at the USGS Patuxent Wildlife Research Center (PWRC) Biennial Science meetings, held at the National Wildlife Visitors Center, Patuxent Wildlife Refuge in Laurel, Maryland 11-13 October. Neal and **TERRY CHESSER** presented talks to the over 70 PWRC scientists and administrators, plus partners in USGS, US Fish and Wildlife, National Park Service, State Wildlife agencies and others who participated in the meetings. USGS Biological Survey Unit staff **CLAUDIA ANGLE, ROBERT FISHER, AL GARDNER, STEVE GOTTE, ADRIANA KULCZAK** and **ROY McDIARMID** also attended the meetings. The objective of the meeting is to showcase current research being done by PWRC staff and encourage new collaborative research with partners.

CLAUDIA ANGLE received an award presented by the Director of Patuxent in recognition of her collection management activities in the Division of Birds.

MERCEDES FOSTER (USGS) was awarded the Alexander F. Skutch Medal for Excellence in Neotropical Ornithology by the Association of Field Ornithologists. It was presented on October 5th at the IV North American Ornithological Congress in Veracruz, Mexico. The award was created in 1997, in celebration of the 75th anniversary of the AFO. This is only the third time the Medal has been awarded.

VZ LUNCH SEMINARS

Please contact **DON WILSON**(633-1265 or E-Mail) to schedule a seminar or suggest speakers for the upcoming year. All seminars are held in the Waldo Schmitt rm. W218 from 12:00-1:00 PM. See E-Mail and elevator for seminar subjects as the date approaches.

November 15, 2006, Wednesday

CHARLES LYDEARD, STRI. "Phylogeny, conservation, and delimiting species of freshwater mollusks."

December 6, 2006, Wednesday

LAUREN HELGEN, Division of Mammals. "Species distribution in Australia's Southern Coastal Waters: An example from an endemic family of featherstars"

January 3, 2007, Wednesday

LEN HIRSCH, Senior Policy Advisor. "We, the Bio-pira"

DIVISION NEWS

MAMMALS

by James Mead

Meetings and talks-

DON WILSON attended the North American Symposium on Bat Research in Wilmington, NC October 19-21.

KRIS HELGEN presented research talks to students and faculty during invited visits to Bucknell University (Lewisburg, PA) in late September, Slaisbury State University (Salisbury, MD) in mid-October, and the State University of New York (Albany, NY) in late October.

Trips and projects-

RUSS COLE, spending a sabbatical year in the Division, is working on a variety of projects with **DON WILSON** and **KRIS HELGEN**. Chief among these is a revision of the genera of ground squirrels.

KRIS HELGEN and **LAUREN HELGEN** visited the collections of the Academy of Natural Sciences (Philadelphia), the New York State Museum (Albany), and the American Museum of Natural History (New York) for research during the last two weeks of October.

Marine Mammal Program -

Summer Strandings

This summer (16-24 July) **CHARLEY POTTER**, necropsy specialist and collections manager for the SI's Marine Mammal Program assisted with ne-

cropsy demonstrations for the American Veterinary Association (AVA) and Pacific Regional Stranding Network Meeting in Hawaii. Working with Dr. KRISTI WEST to set up a necropsy facility to work on stranded marine mammals, he also gave a presentation on the importance of responding to strandings, the need for necropsies, and other items of major concern and met with Kristi's marine mammal class. Potter is working towards the possibility of a necropsy facility for the Pacific Region and spoke with officials at Hawaii Pacific University, Sea Life Park and the Oceanic Institute

The day before Potter was to leave Hawaii a fresh pygmy killer whale (*Feresa attenuata*) was found dead in an area where the US military and a number of other nations are conducting naval war exercises. These exercises take place every couple of years off Hawaii with this year's (called RIMPAC) objective to locate submarines using active sonar, the same kind of sonar that has been implicated in the beachings and deaths of beaked whales in a number of locations around the world. Charley assisted in the necropsy of the pygmy killer whale, a physically and sexually mature female. He worked with veterinarians from Sea Life Park and folks from NOAA Fisheries as well as Kristi West and her students from Hawaii Pacific University. Interesting, preliminary findings indicate a chronic lung problem that is unassociated with the naval exercises. The skull and other tissues will be sent to the SI for the marine mammal collection.

Not to be left wanting, the US East coast presented an unusual stranding soon after Potter's return to the SI.

On Saturday July 29th, an adult bottlenose whale (*Hyperoodon ampulatus*) stranded off Cape Henlopen, died, and was towed to shore by the US Coast Guard and deposited on a remote beach in Lewes, Delaware. There have been only a handful

of sightings and strandings in the United States of this species as bottlenose whales are normally found off the coast of Labrador and further north.



Stranded Bottlenose Whale. Charley Potter in yellow

Potter was called by folks at Delaware's Marine Education Research and Rehabilitation Institute and Maryland Department of Natural Resources to identify and assist in a necropsy of the animal. He, Dr. CINDY DRISCOLLI MD DNR, and SUZANNE THURMAN, MERRI, started working on it around 10 pm, Saturday and finished at 6 am Sunday morning.



Collections -

JIM MEAD, CHARLEY POTTER, PETE KROEHLER (Vertebrate Paleontology) and **PAUL RHYMER** (exhibits) investigated the condition of the Steller's sea cow in the Osteology Hall on the 25th of August. Reports had been received of bone

fragments underneath the mount. The team determined that the mount, which was made in the 19th century and exhibited in the Arts and Industries building when it was still the U. S. National Museum, had probably been put together by a team that was short on time and that used some mounting procedures that were questionable. The team determined that there was no danger to the public from the mount falling down but it needed some conservation measures and should be taken down and remounted.

This specimen is one of two in North America, the other one being at the Museum of Comparative Zoology at Harvard. This is a composite specimen - a whole skeleton of a single animal does not exist. The specimens used in this mount were collected on the Commander Islands, Russia by Leonard Stejneger in 1882 and 1883

CHARLEY POTTER, DEE ALLEN and the MOVE crew continue to work moving the marine mammals from their old home in the West Basement out to their new home in the soon-to-be-finished Building 25 at the Garber Facility. **JIM MEAD, Charley** and **EWAN FORDYCE** visited that facility and Building 26, which now houses the collection of large whales, on Wednesday, November 1. Even though Building 25 is not ready, the move of specimens from the West Basement to a holding area in Building 26 has begun. The pilot whale, killer whale and goosbeaked whale material is already out there. As construction on the new Building 25 progresses we discover changes that have been made in the design that will decrease the amount of specimens that we can store in there. Sigh.....

Research-

DON WILSON and **ROBERT HOFFMANN** completed work on their long-standing Mammals of China project, which is now in press at Princeton University Press.

Fieldwork-

Ecuador Expedition Yields Surprising Results

During the month of August, **KRISTOFER HELGEN** and **DON WILSON** of the Division of Mammals at NMNH led a team of scientists from New



Roland Kays (N.Y. State Museum in Albany) Kris Helgen, Don Wilson

York State Museum, Texas tech University and local universities in Quito on a biodiversity survey along the western slopes of the Andes in central Ecuador. In addition to a good general collection of bats and rodents, they secured several specimens of small carnivores in the family Procyonidae (raccoons and their relatives). The key target of the trip was a new species of Olingo, a small canopy frugivore, that Kris predicted



Kris Helgen and team in Ecuador

would be found in Ecuadorian cloud forest habitats.

Principal among the scientific results of this trip was the documentation of two different species of Olingos in one immediate area. Olingos, small (2-4 pound) arboreal members of the raccoon family, belong to the

mammalian order Carnivora, which also includes dogs, cats, bears, hyenas, and other, mostly, meat-eating mammals. Though most of their relatives are carnivores or omnivores, Olingos eat mostly fruit. This NMNH expedition provides the first demonstration that more than one kind of Olingo can live in the same general area. One of the Olingo species found during the trip has longer hair and a differently shaped skull and teeth compared to currently known Olingos. Specimens of the new species were obtained, as well as its closest relatives, and subsequent molecular analyses by **LAUREN HELGEN** in **JESUS MALDONADO's** lab confirmed the distinctiveness of the new species, which will be described shortly.



Camera trap photo, lowland Olingo, *Bassaricyon gabbii*

Outreach (tours, talks) –

DON WILSON led a tour of the Amazon near Iquitos, Peru, for the Smithsonian Associates in August.

LAUREN HELGEN joined the NMNH/NZP Genetics Lab at an interactive display for the public at the NZP CRC “open Weekend” at Front Royal on October 7-8. The display informed visitors about non-invasive DNA collection and aimed to promote interest in genetics generally. Families were treated to fun hands-on-experiences to learn about the collection and extraction of DNA.

Visitors- (from 1 Aug-1 Nov: 8 foreign, 32 US)

WES HOLLAND, from Auburn University, is spending the semester in the Division, working with **DON WILSON** and **KRIS HELGEN** on tapirs.

Dr. **EWAN FORDYCE**, of Otago University, Dunedin New Zealand visited the Marine Mammal Program from the 23rd of October to the 8th of November, after co-hosting a symposium on "The start of the radiation of Neoceti [modern whales]" at the meeting of the Society for Vertebrate Paleontology in Ottawa. He is here to finish the eternal manuscript on an osteological dictionary of the bottlenose dolphin skull that he has been working on with **JIM MEAD**.

BIRDS

by Christina Gebhard

Research -

The bony palate returns!

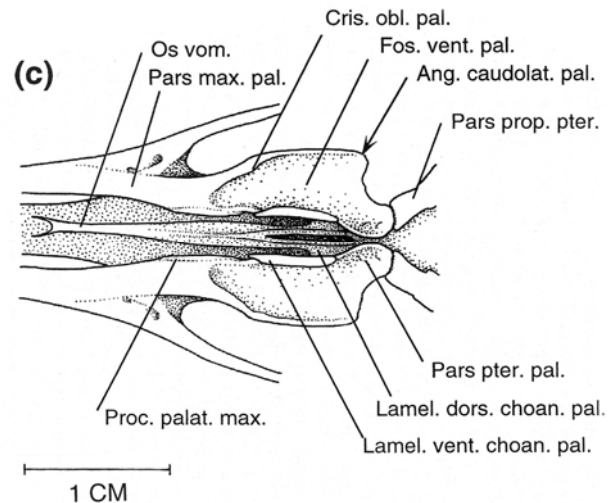
by Dick Zusi

DICK ZUSI, with **BRAD LIVEZEY** (Carnegie Museum of Natural History), completed a study on the avian palate (palatum osseum). The palatine bone (os palatinum) is one of the most variable bones within modern birds. Our initial goal was to facilitate comparative studies and character coding of this bone by identifying homologies and enlarging the available Latinized nomenclature associated with its variation. In all birds, the palatine has three important roles:

(1) as a link in the cranial kinetic mechanism, (2) as a major site of origin of the adductor musculature of the jaws, and (3) as a support for the breathing passage between the nasal cavity and pharynx. In some birds it also serves as protection for the eyes.

We postulated morphological homologies from these basic commonalities and the associated relations with muscles and other bones. The latter relations were enhanced by extensive reference to juvenile specimens in which sutures are still evident.

Because the palatine is a central element in the avian palate, we could not ignore Thomas Huxley's classic paper from 1867 on avian classification, with emphasis on the bony palate. His five palatal "types," later reduced to four (palaeognathous, desmognathous, schizognathous, aegithognathous), represent character complexes that have been used frequently as characters in avian classification.



Palate of American Oystercatcher, ventral view.

As a complement to the extensive literature on the palate since Huxley, we found that imperfect correlation between elements within palatal types suggested that the elements rather than the types would be more useful in phylogenetic analysis. In addition, relations of articulations related to cranial kinesis proved to be much more complex than previously thought. However, among the original palatal types, the palaeognathous palate defines a taxonomic group (palaeognaths) that is usefully distinguished from all other birds (neognaths)

In comparison with several Mesozoic avian taxa we conclude, tentatively, that many features associated with modern cranial kinesis are absent from those taxa, and that features related to the respiratory passage are most conservative.

See: **Zusi, Richard L.**, and B. C. Livezey. 2006. Variation in the os palatinum and its structural relation to the palatum osseum of birds (Aves). *Annals of Carnegie Museum*. Vol. 75, in press (illustration by Taina Litwak).

Fieldwork -

Bird Survey of the Upper Rewa River, Guyana

During the month of August, a team of two SI staff members from the division of birds, **CHRISTOPHER MILENSKY** and **BRIAN SCHMIDT**, traveled to a remote section of southern Guyana to inventory birds as part of the continued effort to understand the distributions and life histories of the avifauna of the Guianan Shield. This survey, co-sponsored by the Biodiversity of the Guianas Program, resulted in numerous new species for our anatomical and tissue collections as well as several species that are poorly known in Guyana. In total, the crew recorded over 230 species of birds during a three week period.



L to R (Kevin Alvin, Royal Merriman, Ashley Holland, Brian Schmidt, Chris Milensky)



Yellow-billed Jacamar (*Galbula albirostris*)

Northern Cape Breton Observations

STORRS OLSON spent considerable time this summer on the northern part of Cape Breton, making field observations and working on manuscripts. Activity patterns of Double-crested Cormorants on South Harbour were found to change rather dramatically as the season progressed. He made a preliminary botanical survey of a nesting island of Common Terns in the same estuary with the view towards establishing whether there may be successional or annual changes affecting the availability of nesting sites, which after the terns had left seemed rather minimal because of density of late summer vegetation. An unusual observation of a Bald Eagle preying on a Garter Snake was noted and an account was sent off to *Canadian Field Naturalist*.

Bahamas

A short trip to the Bahamas united **OLSON** with geologist colleague **PAUL HEARTY** of the University of Wollongong. They prospected for sites with both living and fossil snails of the genus *Cerion* on Abaco and Eleuthera, but with limited success. The weather was miserably hot, while Bahamas air supplied a host of inconveniences. Much more rewarding was meeting **NANCY ALBURY** of Friends of the Environment in Marsh Harbour, Abaco, and seeing some of the spectacular fossils being recovered

from an underwater site on the island containing complete skeletons of tortoises and Cuban crocodiles as well as birds (under study by David Steadman).

This is the first comprehensive vertebrate fossil fauna to be obtained from the Little Bahama Bank and provides Storrs with a lot of incentive to finish up an important fossil fauna he excavated with colleagues on Royal Island, Eleuthera, in 1990---the only undisturbed fossil site yet found on the Great Bahama Bank. Storrs was also able to meet with BRIAN



Olson on northern Eleuthera, Bahamas, next to 2nd largest storm-transported rock in the world. (largest, few feet off to left of picture) These boulders were broken off and transported by waves during violent storms about 120,000 years ago. (as published by colleague, Paul Hearty, who took photo.)

KAKUK, a retired Navy diver who had recovered the underwater fossils on Abaco, and made plans for Brian to join an expedition to explore an underwater fossil site on Mona Island, Puerto Rico, at some later date.

Meetings and Talks -

Unsolved Problem in Macroecology and Biogeography Studied

by Gary Graves

On 6 October, **GARY GRAVES** presented a lecture entitled, “Range-size frequency distributions and source pool geometry. What do they tell us about the assembly of avian communities?” at the National Center for Ecological Analysis and Synthesis (NCEAS), University of California, Santa Barbara.

Gary is part of a NCEAS working group studying synthetic macroecological models of species diversity. A major unsolved problem in macroecology and biogeography is the origin and maintenance of species richness gradients. Biogeographers are currently divided into three major camps: those who favor historical or phylogenetic mechanisms, those who favor explanations based principally on geographic patterns of contemporary environmental variables, and those who advocate the incorporation of null model approaches.

This working group will seek to develop a novel synthesis of historical, contemporary environmental and stochastic assembly hypotheses, by modeling species’ geographic ranges in an environmentally heterogeneous geographical domain, incorporating spatially explicit mechanisms of colonization, range expansion, speciation, and extinction.

CARLA DOVE, MARCY HEACKER, NANCY ROTZEL and **SUZANNE PEURACH** (USGS – Mammals) attended the 8th Joint Meeting Bird Strike Committee USA/Canada held in St. Louis, MO August 21-25th. The meeting was a great success and a few of the presentations included: “Feather Lab Facts and FAQ’s” presented by Marcy Heacker; “DNA

Identification of Birdstrike Remains: A Progress Report” by Carla Dove; “Avian Influenza: What Field Biologists Should Know” a joint poster by Carla Dove and Marcy Heacker; “DNA Identification of Birdstrike Remains – Procedures and Technical Considerations” Poster by Nancy Rotzel; and”Bat Strikes: Past, Present and Future” a poster by Suzanne Peurach.

STORRS OLSON attended the 31st Whaling History Symposium at the New Bedford Whaling Museum in Massachusetts on 14 and 15 October, where he presented a joint paper with his co-worker Judy Lund on the word "woggin," which was used by Yankee whalers for over a century to mean either the Great Auk or penguins. This word then dropped out of use and out of sight. More about woggins later when the paper is published in *Archives of Natural History*.



Bermuda Skink, *Eumeces longirostris*

See Publications section: Olson & Hearty & Pregill for info on geological history of reptiles of Bermuda

MARCY HEACKER gave a talk on bird identification and birdstrike reporting at the Airport Wildlife Management Workshop in Dulles, VA on Sept 10-11. This continuing education program was for airport biologists and personnel and was sponsored by the FAA, USDA, and AAAE (American Assoc. of Airport Executives). **CARLA DOVE** also attended the workshop.

CARLA DOVE attended the North American Ornithological Conference in Veracruz Mexico October 2-7. She co-authored a poster titled “Mapping Species Limits using DNA Barcodes” Carla Dove also participated as a judge for the AOU Student Awards Committee

MERCEDES FOSTER (USGS) participated in the Patuxent Wildlife Research Center Biennial Science Meeting (Oct. 11-13, Laurel, Maryland) and presented a poster on “Behavior and Ecology of the Alder Flycatcher (*Empidonax alnorum*) in Early Winter.”

MERCEDES FOSTER (USGS) attended the 24th International Ornithological Congress in Hamburg, Germany from Sunday, August 13, to Saturday, August 19, 2006 and then continued to Poland to visit the Bialowieza Primeval Forest. This 8,000 year-old forest, which straddles the border between Poland and Belarus, is the last remaining tract of old growth temperate deciduous forest in Europe.

Awards-

CARLA DOVE was elected to Wilson Ornithological Council (2007-2010) and elected member to American Ornithologist’s Union (2006)

STORRS OLSON was recently reappointed Associate in Science at the Bishop Museum for a 3 year period through 30 June 2009.

New to the Feather Lab-

The Division of Birds welcomes **SARAH SONSTHAGEN** as a post-doctoral fellow working on the molecular genetics of the ‘white-headed’ gull species limits. Sarah



received her Ph.D. in August 2006 from the University of Alaska-Fairbanks where she worked with Kevin McCracken on population genetics of Common Eiders. Sarah will be working in the bird division collections as well as at the Laboratories of

Analytical Biology (LAB) at MSC on a two-year fellowship sponsored by the FAA. This project, advised by Smithsonian Ornithology participants, hopes to use a multi-locus approach to identify gulls involved in birdstrikes that are not diagnosable using a single marker and to assess the post-glacial colonization of these gulls. Please stop by and say 'hi' to Sarah (E-601 or find her desk in the packing area).

General News -

Featured in the 'Around the Mall' section in the August 2006 issue of *Smithsonian Magazine* (Vol. 37, no. 5), the article "Xtreme Birding" featured the Smithsonian/Bushnell Capital Kingbird. The four person team participated in the 23rd Annual World Series of Birding that took place in New Jersey. **CHRISTOPHER MILENSKY** and **CARLA DOVE** participated as scouts for the event.

The collection management staff conducted its annual pest inspection of the skin collection. Again this year no infestations or live insects were found in the collection.

Visitors-

Famed photographer **ANNE LEIBOVITZ** and her daughter were shown around the division of Birds by **CARLA DOVE**.

The Division of Birds hosted 66 visitors since the last edition of the Backbone. Seven of our visitors arrived from the following countries: Australia Canada, Netherlands, New Zealand, Sweden, and United Kingdom. The remaining 59 visitors were domestic from the following states: CA, CT, DC, FL, LA, MD, MN, NJ, NY, NC, OR, TN, and VA.

Amphibians and Reptiles

by Steve Gotte

Trips and Meetings -

KEVIN DE QUEIROZ did a good deal of traveling this quarter. He was in: 1) New Orleans, LA, for the Joint Meetings of Ichthyologists and Herpetologists (12-17 July); 2) Athens, OH, to work with collaborators on projects on the phylogeography of *Xiphophorus birchmanni* and phylogenetic nomenclature (26 Aug – 07 Sep);



Adult male, *Anolis cristatellus wileyae*, Guana Island . Photo by K. de Queiroz



Carrot Rock home to endemic species *Anolis ernestwilliamsi*. Photo by K. de Queiroz

3) British Virgin Islands (Tortola, Guana, Carrot Rock) to collect Anolis lizards for ongoing studies (22 Sep – 01 Oct);



Sphaerodactylus macrolepis, small gekkonid lizard from Virgin Islands sometimes eaten by anoles. Photo by K. de Queiroz

4) Xico, Veracruz, México for the Latin American Meeting of the Animal Behavior Society (06 – 15 Oct).



Kevin de Queiroz. Photo by Mollie Morris

BRAZIL

MIRIAM and **RON HEYER** worked at the Instituto Nacional de Pesquisas da Amazônia (INPA) in Manaus, Brasil from 7-16 August 2006. The primary purpose of the trip was to determine whether the INPA collections had any specimens of the *Leptodactylus bolivianus* complex from the State of Pará, Brasil. This was the last collection where it was likely that such specimens might be housed. The negative data from previously evaluated collections was supported by the INPA collection.

As part of the process of locating specimens of the *L. bolivianus* complex to take data on, over 100 frogs were identified or re-identified. The most significant of these was finding the first species record for Brasil of *Adenomera lutzi*.

Ron and Miriam were invited to go on an overnight reconnaissance trip for the INPA project, BioTupé, near Manaus. Colleague Dr. CELSO MORATO DE CARVALHO invited them to help evaluate whether a herpetological inventory of the extractive reserve was feasible. The site is most suitable to undertake an intensive inventory, which Dr. Carvalho is initiating. Ron and Miriam stopped in São Paulo for a couple of days after Manaus to take data on some *Leptodactylus*. Ron was asked to give a seminar at the Museu de Zoologia in São Paulo. He gave the same seminar, “Lowland Neotropical Frog Systematics Through the Eyes of the Genus *Leptodactylus*,” at INPA and the MZUSP. This research trip was supported by the Small Grants Program, NMNH.

Kudos-

GEORGE ZUG was reappointed as a Distinguished Associate in Research at the Bernice P. Bishop Museum for a three year term, 2006-2009.

Visitors -

The Division hosted more than 38 visitors from 11 states (AZ, CA, DC, IA, KS, MD, NY, SC, TX, UT and VA) and 3 countries (Argentina, Cambodia and Germany) for a total of over 130 researcher-days, since the last Backbone. In addition several local researchers and students visit the division on a regular basis.

Students, RAs, Fellows -

SAYANTAN BISWAS (GWU Ph.D. student) recently returned from his last field trip to collect data for his dissertation research in the Western Ghats region of India.

ROSARIO CASTAÑEDA (GWU Ph.D. student) recently returned from a field trip to South America where she was collecting *Anolis* lizards and data for her dissertation research.

OMAR TORRES CARVAJAL (Postdoctoral Fellow) is writing up papers from his dissertation on the systematics of *Stenocercus* lizards as well as collecting new data for studies on the phylogeny of hoplocercid lizards and the higher-level phylogeny of iguanid lizards. Omar recently returned from a field trip to the eastern lowlands Ecuador where he collected specimens of *Morunasaurus annularis* for the study on hoplocercid phylogeny based on DNA sequence data.



M. annularis. Photo by Omar Torres Carvajal



Detail of tail of *M. annularis*

CALEB MCMAHAN, an Erskine University undergraduate & RTP intern, investigated morphological differentiation in the Myanmar populations of the Asian smooth gecko [*Hemidactylus bowringii*] with **GEORGE ZUG**. This research was Caleb's first collections-based and systematic study, and encouragingly, it opened a new biological horizon for him and may serve as a springboard to his doctoral research. The interchange between Caleb and George continues with the goal of a manuscript by the end of 2006.

FISHES

by Jeff Williams, Dave Smith and Tom Munroe

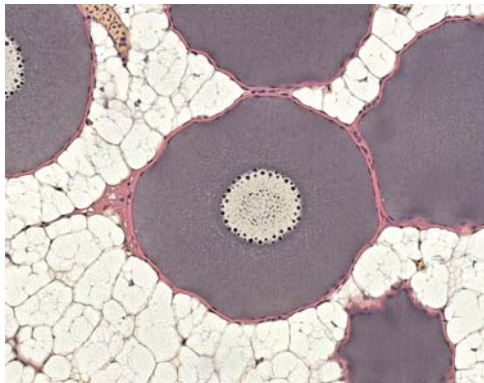
Meetings and Seminars-

As NOAA representative to ITIS, **BRUCE COLLETTE** participated in a Workshop for Department of the Interior customers of ITIS on Sept. 26 in the Executive Conference Room. The many varied uses and users of ITIS by DOI in dealing with plants and animals were detailed.

On Sept. 29, **BRUCE COLLETTE** represented NMFS/NOAA at a meeting of the Interagency Working Group on Scientific Collections held in the Regents' Room of the Castle.

DAVE JOHNSON attended the 30th Annual Larval Fish Conference held in Lake Placid at the 136th Meeting of the American Fisheries Society and presented a talk: "Rare young stages representing three families of marine fishes." The talk was co-authored with JOHN OLLNEY of VIMS and was based on larval fish specimens they discovered last year in the extensive larval fish collections housed in the National Science Museum, Tokyo.

HELEN WIMER and her colleague, **NANCY MARINOS** from NiH, presented their workshop; “Cutting It the Hard Way”: Animal Tissue Techniques for Frozen, Paraffin and Glycol Methacrylate Sections” at the National Society for Histotechnology’s Annual Symposium on September 10, 2006. They have been invited to present the same workshop to the New Jersey State Society for Histotechnology in March of 2007.



Histological section through the ovary of a paddlefish, *Polyodon spathula*. A follicle encloses a maturing oocyte or cell that will become an egg.

Research –

Intromittent Organ in Genus Monotocheiroduon

STAN WEITZMAN and **JOHN R. BURNS** have collaborated on a study of the intromittent organ in the Genus *Monotocheiroduon* (Characiformes: Characidae. (full title citation in Publications section).

The study histologically documents the first record of an intromittent organ with a complex muscular and skin wall in any member of the South American freshwater fish family Characidae. The organ was found in what appears to be two as yet undescribed species of *Monotocheiroduon* from Peru, State of Puno. The previously known species of this genus, *Monotocheiroduon pearsoni*, is from Bolivia, State of Beni and has no intromittent organ. All three species

were also found to be inseminating. That is the male introduces sperm into the female's reproductive tract, but the eggs are not fertilized until the eggs and sperm are shed together at some later date by the female into the aquatic environment without the presence of a male. The accompanying figure shows a histological section of the intromittent organ with the testis still attached. The inset figure shows the open tip of the intromittent organ.

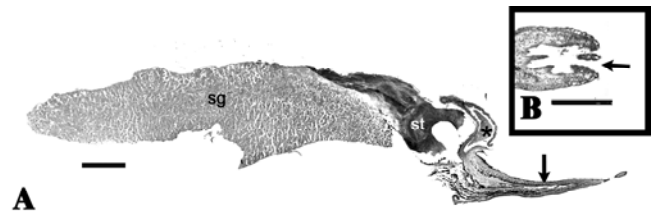


Figure shows a histological section of the intromittent organ with the testis still attached. The inset figure shows the open tip of the intromittent organ.

Three papers by **BRUCE COLLETTE** resulting from the 4th International Billfish Conference last year (one with **TOM ORRELL** and **DAVE JOHNSON**) were completed, submitted, and the galleys read for inclusion in an upcoming issue of the Bulletin of Marine Science. Two papers on eastern Atlantic toadfishes were also completed with David Greenfield.

TOM MUNROE continued working on a collaborative research project examining the ecology of flatfishes of lower Chesapeake Bay with VIMS colleagues, **HANK BROOKS** and **WENDY LOWERY**. They will author a paper to be presented at the 10th Flatfish Biology Conference to be held in Westbrook, Connecticut, in November.

Trips and Travel -

RICH VARI traveled to the Universidade de São Paulo, Ribeirão Preto, to work with **RICARDO CASTRO** on their guide to the fishes of the Serra da

Bodoquena region and on their phylogenetic study of the Characidae.

LYNNE PARENTI visited the Museo Zoologico, Università di Firenze on a trip to Italy in mid-October and was given a tour of the fish collection by the university museum's research associate in ichthyology, ANNAMARIA NOCITA. The collection's strengths are in fishes from Italy as well as northern Africa.

BRUCE COLLETTE traveled with JOHN GRAVES of VIMS to Cape May on Aug. 30 to examine specimens of white marlin and the so-called roundscale spearfish or hatchet marlin that had been collected by a sport fishing tournament. Later **RUTH GIBBONS** went to Cape May to pick up a re-frozen specimen of roundscale spearfish to bring back to the museum for further examination and eventual addition to the fish collection.

Activities-

MARILYN and **STAN WEITZMAN** hosted a visit ("field" trip) to the Division of Fishes on Friday morning of Oct. 20, 2005, for attendees of "The All Catfish Convention, 2006" hosted by the Potomac Valley Aquarium Society Oct. 20-22, 2006.

CAROLE BALDWIN is featured in the Fall 2006 issue of *Smithsonian In Your Classroom: Introduction to the Nature Journal*. Look for it on www.smithsonianeducation.org

CAROLE BALDWIN gave the keynote address at the Smithsonian Science Education Academy for Teachers Biodiversity Celebration Dinner on July 27, 2006.

BRUCE COLLETTE sent some scombroids in the NMFS walk-in freezer to **JOHN OSOSKY** at MSC and found that even though these specimens are

almost freeze-dried, they can be successfully made into skeletons using the dermestid beetle colony.

TOM MUNROE provided tours of the Fish Collection for Dr. NANCY THOMPSON, Director of the National Marine Fisheries Service Southeast Fisheries Science Center, and Dr. NICHOLAS BAILLY, Officer in Charge of the Philippine Office, The World Fish Center, Los Baños, Philippines

Fish Barcode of Life Program –

As part of the Fish Barcode of Life program, **BRUCE COLLETTE** has been taking tissue samples of up to 5 individuals of fishes collected during survey cruises of the Northeast Fisheries Science Center (NEFSC) at Woods Hole. The idea is to create a DNA-based identification system of all fishes based on sequence diversity in a single gene region - a section of the mitochondrial DNA gene cytochrome c oxidase I (COI). This system has worked well in many other groups of organisms so a special effort is being carried out to try to sample all species of fishes by 2010.

There are several scientific and practical reasons why this project will be of benefit once we have built a COI database of most of the marine fish species occurring in the northeast region.

- (1) Barcoding works for all stages in the life cycle so barcoding will assist in identification of larval fishes.
- (2) Barcoding usually differentiates between closely related species that are difficult to distinguish using traditional characters.
- (3) Barcoding can be used to positively identify species of fishery products such as fish fillets.
- (4) Barcoding can be used to verify identifications of fishes caught as by-catch and to validate identifications of species under regulation appearing in fishery catches.
- (5) Barcoding is useful in identifying fishes found in stomach contents.

So far, **BRUCE** has collected tissues from 116 species representing 73 families, and tissues samples from 67 of these species have been retained for possible deposition at USNM. Vouchers for most of these specimens have been or will be cataloged into the USNM fish collection.

Belize: Odd Fish and Marine Invertebrates

In the spirit of cross unit collaboration, **DIANE PITASSY** served as field assistant from October 11-26 to SERC post-doctoral fellow Dr. **AMY FREESTONE** in Carrie Bow Cay, Belize. The two were often dive buddies during the Scientific Diver Certification Program held in May 2006. Dr. Freestone is conducting a study on latitudinal variation in the effects of species induced structural heterogeneity on sessile marine invertebrate diversity. Diane assisted Dr. Freestone in underwater photographic surveys and helped gather environmental data from the three island study sites near Carrie Bow Cay. Of course there was also the opportunity to see the odd fish or two (see photo).



Batfish, *Ogocephalus nasutus*, photo by Amy Freestone

Awards and Honors-

CAROLE BALDWIN received the 2006 Ronald E. Carrier Distinguished Alumni Achievement Award at a gala event at James Madison University in Harrisonburg, VA, on October 20, 2006. The Carrier

award recognizes a JMU alumnus who has excelled in his or her profession for a minimum of five years and has attained recognition from peers or other professionals as an outstanding member of their field.

TOM MUNROE received a Visiting Collections Fellowship from the Australian Museum to conduct research in the fish collection. Tom anticipates traveling to Australia early next year when he will continue research on the flatfishes from Australian seas.

Visitors-

Fishes has hosted 31 visitors including the following:

DI BRAY and **MARTIN GOMON**, Museum Victoria, Melbourne, Australia; To work on various marine fish families in the collection.

JAIME ALVARADO BREMER from Texas A&M, visited **BRUCE COLLETTE** on October 5 to discuss molecular phylogeny of scombrid fishes.

ALEXANDRE R. CARDOSO, Museu de Ciencias e Tecnologia (MCP), Porto Alegre, Brazil; Studying Aspredinidae catfishes.

HARRY GRIER, Florida Fish and Wildlife Research Institute, St. Petersburg, FL., visited the Fish Division from 28 August through 5 September to work with **LYNNE PARENTI** on their collaborative research on fish reproductive biology.

HSUAN-CHING (HANS) HO, Lab of Fish Ecology & Evolution Research, Center for Biodiversity, Academia Sinica, Nankang, Taipei, Taiwan; To review the genera *Halieutaea* and *Halieutopsis*.

DOUG HOESE, Australian Museum, Sydney, Australia; Studying gobies.

JAY KILLIAN, Maryland Department of Natural Resources, Annapolis, Maryland; Examine holdings of *Notropis bifrenatus*.

MARCELO MELO, Auburn University, Auburn, Alabama; Digital radiography of fishes using our facility.

LARRY PAGE, Florida Museum of Natural History, Gainesville, Florida; Working on Texas Cyprinids.

BRIAN SIDLAUSKAS, Duke, North Carolina; visited the Division to work with **Rich Vari** on a collaborative phylogenetic study of the South American fish family Anostomidae.

MATTHEW THOMAS, Kentucky Dept. of Fish and Wildlife, Frankfort, Kentucky; Examine Loricariid types and cyprinids (old & new world).

JIM VAN TASSELL, American Museum of Natural History Research Associate-in-Residence, Biology Dept., Hempstead, New York, United States; To take digital radiographs of *Bollmannia* for a project his undergraduate student is doing to revise the Atlantic species of the goby genus *Bollmannia*.

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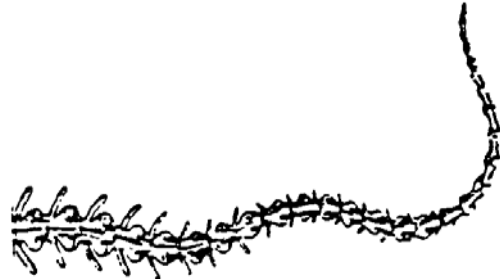
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**Recently addressed in October 20, 2006 *Natural History News*.

***NOTE --

Craig C. Mello who recently shared the Nobel Prize in Physiology or Medicine 2006 for the discovery of RNA interference—gene silencing by double-stranded RNA was an early summer research intern working with **Ron Heyer**, curator of amphibians and reptiles (probably 1978). Mello is son of the then deputy director of NMNH.

Heyer and Mello published a paper together:
Descriptions of the Advertising Calls of *Cycloramphus asper* and *Cycloramphus dubius* (Amphibia: Leptodactylidae) 1979. *Papéis Avulsos Zool., S. Paulo, Vol. 32 (15): 193-200*.



MAILING LIST

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