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# MCZ newsletter

MUSEUM OF COMPARATIVE ZOOLOGY

## SIDNEY A. AND JOHN H. HESSEL CHAIR IN LEPIDOPTERA ESTABLISHED

The vote of the President and Fellows of Harvard College on April 24, 1978 establishing the Sidney A. and John H. Hessel Professorship of Biology and Curatorship in Lepidoptera is a landmark event in the history of the MCZ. It will enable the MCZ to become and remain a center of excellence for the study of Lepidoptera, the lifelong dream of benefactor Sidney A. Hessel, Harvard, 1928. (John H. is his son, Harvard, 1956.) The Hessel Chair now joins the Bigelow Chair in Ichthyology and the Alexander Agassiz Professorships in ensuring that the MCZ will continue in the forefront of the study of the natural sciences.

Sidney A. Hessel (Harvard, 1928), who worked for many years in the Lepidoptera collections at the Peabody Museum of Natural History, Yale University, where he held

a research appointment, first approached then MCZ Director Alfred S. Romer in 1959 with the intention of starting a fund to support scientific study in Lepidoptera in the MCZ. He added to the initial amount regularly thereafter until his death in 1974.

Dr. John M. Burns, now at the Smithsonian Institution, was supported by this fund during his term as Associate Professor of Biology and Associate Curator of Lepidoptera from 1969 until 1975.

The first incumbent of the position is Dr. Robert E. Silberglied, who was appointed as of July 1, 1978 for a three-year term. At the end of this term, a tenured appointment will be made following a world-wide search for the leading lepidopterist.

The MCZ Lepidoptera collection contains approximately 750,000



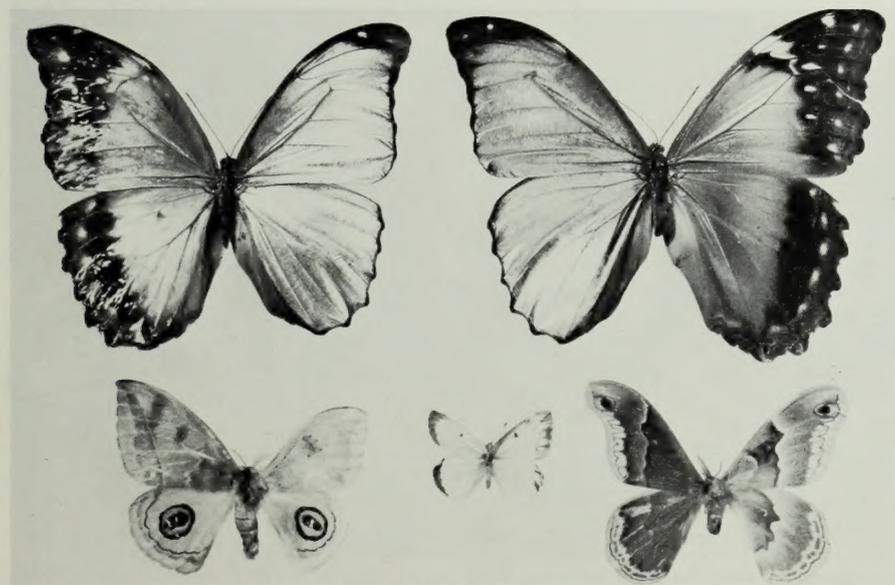
*Sidney A. Hessel in 1948.*

Photo by G. W. Rawson

butterflies and moths, and is considered among the finest of any educational institution in North America. Recent renovations (with the aid of a grant from the National Science Foundation Systematic Biology Division) included the transfer of the collections into new metal cases, providing protection against damage, and the installation of adequate lighting and working space. Recent gifts, including much of Sidney A. Hessel's extensive collection of New England Lepidoptera (which doubles the MCZ's holdings in some groups), have improved important areas of the collections.

"Our Lepidoptera collection", according to Dr. Silberglied, "represents a fine resource for teaching in genetics, evolution, speciation, adaptation, and biogeography. The collection is also strong enough in most groups to serve as a foundation (augmented temporarily by loans from other institutions) for research in systematics. With its new housing and curation, it should continue to function as one of the MCZ's truly outstanding collections."

*Rare, prized specimens from the MCZ Lepidoptera collection. What's "wrong" with these butterflies? (For answer, see inside.)*



# DR. SEELEY STUDIES BEES "BEFORE HIVES"



Dr. Thomas D. Seeley with vacated wasp nest, composed of wasp-manufactured paper. Wasps build annual nests of paper, while honey bees' nests are perennial in hollow trees.

Recent Harvard Ph.D. Thomas D. Seeley has been appointed a Junior Fellow\* of Harvard University as of July 1, allowing him to continue his studies of honey bees for the next three years without any teaching or other formal responsibilities. Dr. Seeley's research has focused on honey bees under natural conditions in forests, an aspect hitherto largely displaced by scientific concentration on the physiological basis of bee sociality

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Paula Chandoha

using colonies living in man-made bee hives.

For his Ph.D. thesis, "Nest site selection by the honey bee", Dr. Seeley analyzed how honey bees choose a home site, generally a hollow in a tree, when left on their own. Among other things, he determined how scout bees measure nest cavity volume. Through simple yet elegant field experiments he discovered that bees "pace off" the dimensions of potential nest sites. Nest size is an important factor for bee colonies, influencing the timing of colony reproduction. Colonies grow until they become overcrowded in their nests and then divide by swarming. Beekeepers prevent swarming, which diverts efforts from the bees' honey-producing activities, by adding another chamber (or "super") to crowded hives.

Dr. Seeley plans to spend part of the next three years studying tropical honey bees in the jungles of Thailand. "The tropics are the homeland of honey bees", he points out, "which is why they have perennial colonies which reproduce by swarming." Bees have adapted to the cold, flowerless sea-

sons in temperate climates by stockpiling great quantities of honey in the warm summer to give them the necessary food to "whirr" their wings throughout the winter, generating enough heat in their nests to keep them warm. On the first warm day of spring, they emerge *en masse* to defecate.

There are three species of true honey bees in the Asian tropics. Dr. Seeley will study how they differ in colony size, aggressiveness, nest site, demographic properties and other characteristics, and how differences between species in these traits relate to one another.

Dr. Seeley, who majored in organic chemistry for his undergraduate work, first became interested in bees because of their elaborate chemical communication. According to Dr. Seeley, with tongue partially in check, "I like to think I bring some of the rigor of the 'harder' sciences to the study of social behavior".

\*According to the Official Register of Harvard University, Junior Fellows "are selected for their promise of notable contribution to knowledge and thought, by such methods as in the opinion of the Senior Fellows [who consist of the President of the University and the Dean of the Faculty of Arts and Sciences, *ex officio*, and of a Chairman and nine others] shall seem most likely to measure their future capacity".



Two worker honey bees exchanging food on a comb of honey. Photo by Thomas D. Seeley

# RUTH D. TURNER SPENDS SUMMER IN RUSSIA

During August and September Professor Ruth D. Turner traveled to the summer research station of the Vladivostok Far East Science Centre, Institute of Marine Biology at Vostok to look for *Zachisia*, a native genus of Teredinidae (ship-

worm). As the first U.S. exchange scientist under the U.S./U.S.S.R. Joint Committee on Cooperation in Studies of the World Ocean/Group on Biological Productivity and Biochemistry of the World Ocean, she was the guest of the Academy

of Sciences of the U.S.S.R.

In 1976, during her first Russian visit to attend a symposium conducted by the U.S./U.S.S.R. Joint Committee, Dr. Turner (author of *A Survey and Illustrated Catalogue of the Teredinidae, MCZ, 1966*) looked for this specimen in the museums of Moscow and Leningrad without success.

This year's visit resulted in the collecting of numerous specimens on the genus *Zachisia*, the only remaining genus in the family Teredinidae which Dr. Turner had not seen. *Zachisia* bores into the roots of two sea grasses found in the area of Vladivostok and Peter the Great Bay in the Japan Sea. In order to amplify the original 1933 description, Dr. Turner is now studying all aspects of this unusual animal. So far she has discovered that it has a bizarre life history with a larval stage unlike any other bivalve. Anatomical and histological studies are now in progress.

Dr. Turner plans to return to Russia in 1979 to present a paper with Dr. Yakovlev on their joint research on *Zachisia* at the Fourteenth Pacific Science Congress at Khabarovsk.



The marine research station at Vostok, U.S.S.R.



Colleague Dr. Yury M. Yakovlev holding a clump of the sea grass *Phylospadix* in which the shipworm *Zachisia* lives.

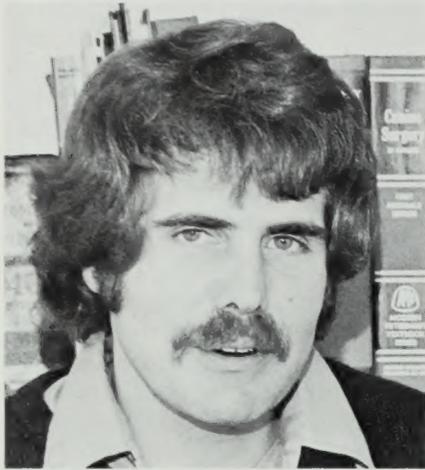


The white worm-like creature on the right is *Zachisia*, the animal which lured Dr. Ruth Turner to Russia.

Photos by Ruth D. Turner

# TWO NEW RESEARCHERS AT THE CONCORD FIELD STATION

Vaughan A. Langman



Dr. Vaughan A. Langman, recently returned from seven years in Africa, has joined the Concord Field Station staff for a two-year postdoctoral study of heat balance during exercise in carnivores. His research animals include foxes, wolves and coyotes.

After receiving an M.S. degree from the University of the Pacific, Dr. Langman obtained a grant for foreign students from the Council for Scientific Research for a three year Ph.D. study on large mammal behavior. Working with his large mammal, the giraffe, obviously presented a physical as well as an intellectual challenge. Catching giraffes in the 600 kilometer study area, attaching radio collars, and tracking their behavior by Land Rover yielded many hitherto unknown facts and posed some interesting questions. For instance, why do mothers hide their newborn for the first month of life? Why do they subsequently find one or two other mothers with offspring of identical age and leave them together in a giraffe equivalent of a kindergarten for the next year of life? The thermoregulatory constraints of their size and shape proved to be the prime factor in determining these and other unusual behaviors.

Physiological studies conducted during a four year appointment as Lecturer in the Faculty of Veteri-

nary Medicine at the University of Nairobi, involved measuring oxygen consumption and temperature

regulation; a scaffold was constructed in order to attach the oxygen-measuring mask and biotelemetry apparatus.

On Tuesday, December 12, Dr. Langman will give an illustrated talk to the Friends of the MCZ on "Maternal Behavior in Giraffes".



*Two giraffe mothers and their offspring.*



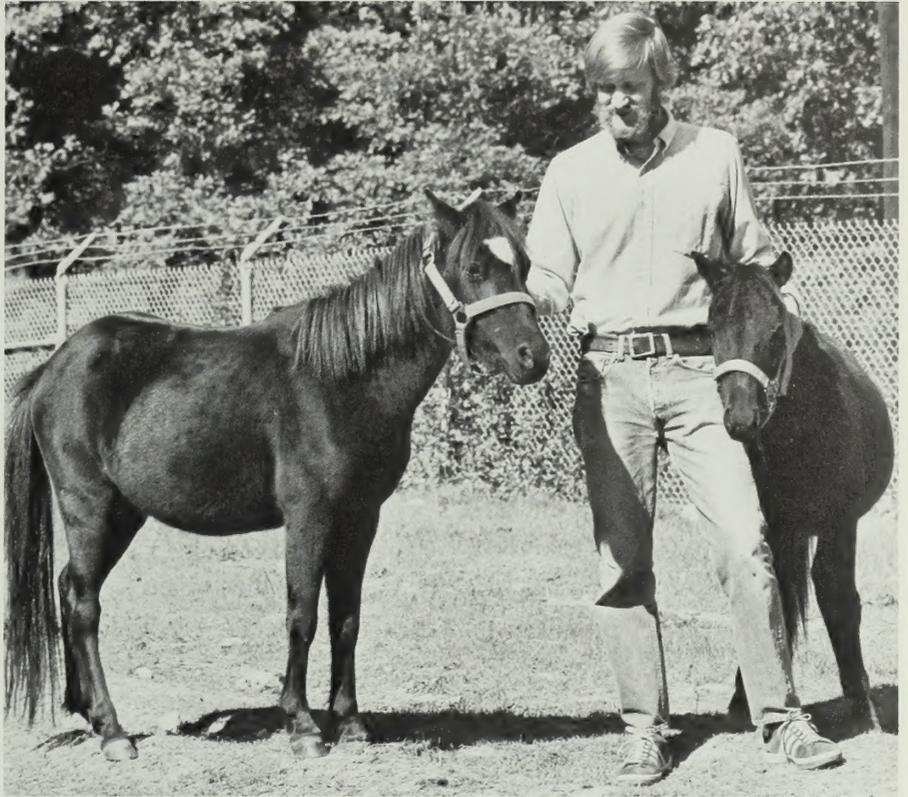
*Territorial giraffe battle. The radio collar on the giraffe on the right was attached by Dr. Langman as part of his behavioral study.*

Photos by Vaughan A. Langman

## Donald F. Hoyt

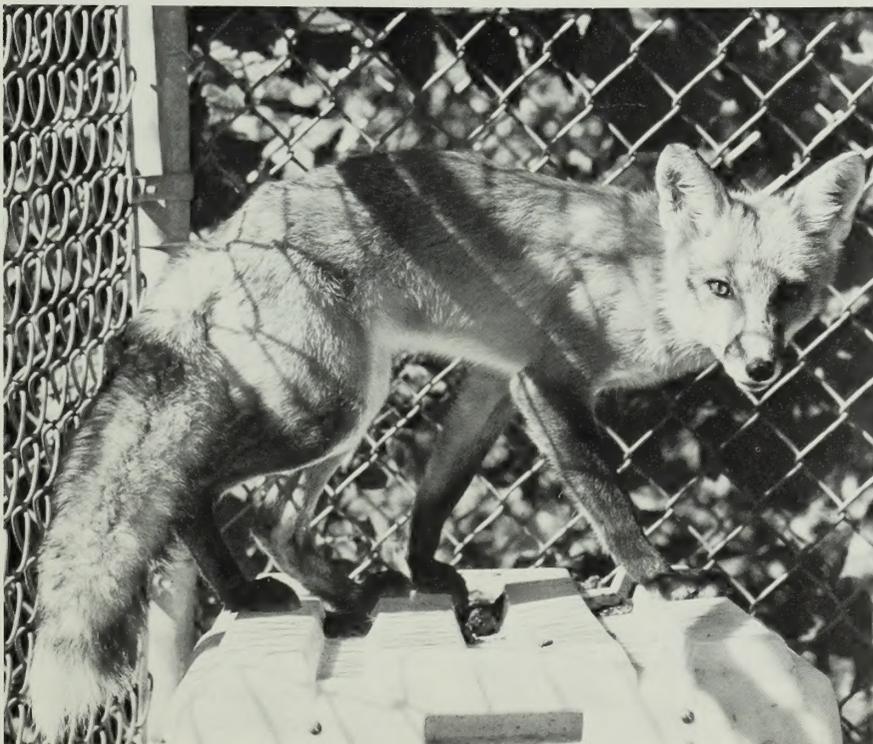
Dr. Donald F. Hoyt, a physiological ecologist at the Concord Field Station, is studying the basic mechanics of locomotion and specifically, why animals change gaits.

Classically, biologists have assumed that the metabolic cost of running is proportional to running speed squared. Dr. Taylor's initial observations on the relationship between metabolic rate and running speed showed the relationship to be perfectly linear and that there was no dramatic change in energy consumption when the animal changed gaits (i.e., from walking to trotting to galloping). Dr. Hoyt's working hypothesis is that the relationship between oxygen consumption and running speed is really a series of shallow curves, one for each gait, and that the animal makes the transition between gaits at the point where the curves intersect. The experiment involves training the animal to extend its gait beyond the normal transition speed, i.e., to trot at a speed where it would normally be galloping. If the hypothesis is correct, the metabolic cost of trotting should be greater than the



*Dr. Donald F. Hoyt with two ponies who have been trained to trot at speeds at which they would normally walk.*

metabolic cost of galloping at the same speed. This is one possible explanation of why horses in a trotting race do not run as fast as thoroughbreds which gallop.



*These red foxes at the Concord Field Station are part of Dr. Langman's study of heat balance during exercise in carnivores.*

# NATURAL HISTORY COLLECTIONS OF THE CONCORD FIELD STATION GROWING



Jean Baxter takes a close look at an umbrella magnolia while (l to r) Mary Walker, Katherine Roop, and Ray Angelo, all of the Natural History staff at the Concord Field Station, assist.

From a modest beginning in 1974, the Herbarium collections at the Concord Field Station have grown from about 1,500 to over 3,000 card-catalogued pressed specimens of New England plants, primarily from the Concord area. An additional 1,000 are currently being catalogued. Recent acquisitions, including the Massachusetts Audubon Herbarium, are bringing the collections nearer the goal of achieving complete representation for Eastern Massachusetts. In addition, an insect collection of over 1,000 local species and developing collections of diatoms and spiders make this resource invaluable to local naturalists.

The staff originally assembled in response to a local newspaper announcement by William K. Newbury, formerly of the Field Station

staff, requesting volunteers to assist with various plant experiments being conducted by Harvard botanists. The staff includes Ray Angelo (author of *Concord Area Trees* and *Concord Area Shrubs*, both published by the MCZ), Mary Walker and Jean Baxter (who specialize in plants), Katherine Roop (diatoms, streams), and Elaine Plumber (spiders). This volunteer staff provides a number of services to the local community including assistance in local plant and insect identification, assistance for town wetlands and woodlands managements studies, and, in one instance, assistance to Lexington's Conservation Commission with regard to town policy affecting proposed channelization and piping of streams in that town. Other staff activities include courses for

both the general public and local schools, exhibits, publications, and various cooperative activities with other local nature organizations.

With a modest budget of \$1,000 provided for two successive years by the Friends of the MCZ, herbarium cabinets and biological supplies, as well as the beginnings of a comprehensive local natural history library have been assembled.

Visitors are welcome on Tuesdays (10:00 AM–3:00 PM) or by appointment by calling Mary Walker (369-5393) or Jean Baxter (862-1054).

## JANE BALDWIN LEAVES MCZ LIBRARY



Jane Baldwin, who came to the MCZ Library as Cataloguer in June, 1975, resigned her position in October to return to her native Holland. She plans to continue her library work while her husband, Dr. Baldwin, pursues a research career at the University of Leiden. Mrs. Baldwin served as Acting Librarian of the MCZ Library from May, 1977–January, 1978 when current Librarian Eva Jonas was appointed.

## SUMMER VISITOR FROM THE SMITHSONIAN



Dr. Stanley Weitzman, Curator of Fishes at the Smithsonian Institution, has been a Visiting Curator in the Fish Department for the past 3½ months. He has been working on the Thayer Expedition collections of freshwater fishes from South America collected by Louis Agassiz. Dr. Weitzman has been helping to prepare a catalog of the type specimens in this historically important collection and of other South American collections in the MCZ. He has also been finishing some joint research projects on the systematics and distribution of South American freshwater fishes with his former graduate student, MCZ Assistant Professor/Assistant Curator of Ichthyology, William L. Fink.

All this work is part of an extensive program of research on the ecology and zoogeography of the Amazon basin, for the most part funded by the Smithsonian Institution and headed by Dr. Clifford Evans, Curator of Anthropology at the Smithsonian.

Dr. Weitzman is attempting to coordinate his research on South American fishes with that of curators in other museums in North and South America, with his

own present and past graduate students, and with Postdoctoral Fellows at the Smithsonian Institution. Dr. Weitzman estimates that current knowledge of the systematics and zoogeography of South American freshwater fishes is between 75 and 100 years behind that of North American freshwater fishes. This large lag is in part due to the difficulty and cost of collecting in South America and also due to lack of financial support for such studies.

## FRIENDS OF THE MCZ SHOW TRAVEL PHOTOS

"Animals from Africa, Antarctica, and the Galapagos Islands and other travel photographs by the Friends of the MCZ" were on display during September and October in the MCZ's changing exhibition gallery. The ten contributors were: Paula Chandoha, Margaret H. Collier, John Constable, Don W.

### "UNUSUAL BUTTERFLIES"

#### Answer:

Each of the butterfly specimens in the photograph is half male and half female! Such individuals, known as gynandromorphs, are due to genetic accidents in early development. They are exceedingly rare, occurring only once for every 10,000 to 100,000 individuals. More than mere curiosities, they demonstrate certain principles of development. For example, the local expression of sex (rather than an overall, intermediate condition between the two sexes) demonstrates that sex is controlled in butterflies at the cellular level. In mammals, circulating hormones control the expression of sex in the entire body.

Fawcett, Francis H. Gardner II, Dotte Larsen, Alfred W. Scott, Emily Hubbs Scott, Robert Vile and Fred Z. White.

An accompanying slide show, with slides contributed by numerous traveling Friends, also featured trips to Baja California, Ecuador, and Surinam.



Director and Mrs. Alfred W. Crompton greet Drs. Karel Henneman and Don W. Fawcett at the opening of the Friends' exhibition of travel photographs.

# THE SEARCH FOR THE BLUE TEIID LIZARD

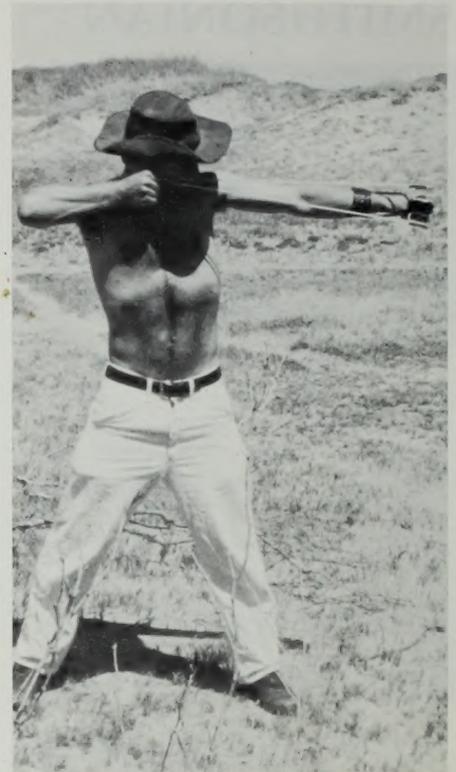


*Blue teiid lizard. Notice the unusual pupil shape.*

This lizard from Venezuela is elusive—and very fast. Scientists have been trying to capture a study specimen since 1972 when the MCZ's Curator of Herpetology, Professor Ernest E. Williams, first saw one and realized it was something special. It was subsequently seen five times but it was too quick to catch . . . until last summer when Dr. Russell A. Mittermeier and Mark Plotkin, curatorial assistant in the MCZ, equipped with sling-shots, bow and arrows, traps, and

local children mounted their "Blue Teiid or Die" expedition. Their campaign, aided generously by Dr. Abdem Lancini, Director of the Museo de Ciencias Naturales, Caracas, was successful: 14 individuals were captured, three of which are now exhibited at the Bronx Zoo.

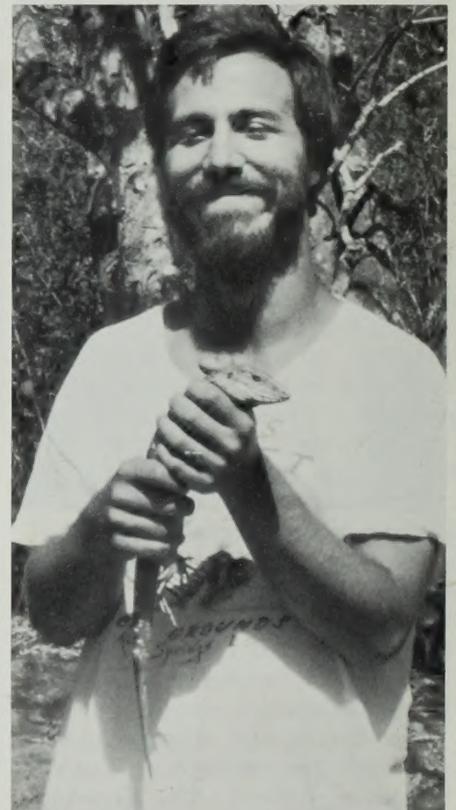
Preliminary studies are revealing that this isolated form (it lives on the Paraguaná Peninsula just south of Aruba) is either a new species or subspecies of the Ameiva lizard.



*Mark Plotkin exhibits one successful blue teiid catching technique.*



*Russell A. Mittermeier with local children and prize catch.*



*Portrait of a successful lizard hunter.*

Photos by Russell A. Mittermeier and Mark Plotkin.

