

Special 80 page Issue! Featuring the Amazing Chacoan Monkey Frog

the VIVARIUM

Human/Reptile Interface at the Edge of the Third Millenium

Volume 8 Number 5



**The Fijian Banded Iguana
A Visit with Steve Hammack
Leaf-tailed Geckos of Australia
Planted Vivarium Modules**

6.95 U.S. \$10.00 Canada



HERPTIVITE™

Premium Quality Multivitamins for Healthy Exotics.



Photo by Dante Fenolio

ATTENTION DEALERS...

Fax or Mail your business card for free shelf talkers and product support!



Rep-Cal®

Quality Nutrition for Reptiles

Rep-Cal Research Labs

P.O. Box 727

Los Gatos, CA 95031

Phone: 408-356-4289

Fax: 408-356-3687

All-Natural source ingredients...

Nothing artificial.



No Vitamin A toxicity...

The FIRST Reptile Supplement that exclusively uses Beta Carotene, a unique anti-oxidant that is *naturally converted* into Vitamin A by reptiles, thus preventing the threat of toxicity inherent with other supplements.



Nutritional Sea Vegetation Base...

Provides a rich, natural source of essential trace elements and minerals (unlike other reptile vitamins which utilize non-nutrient bases and fillers).



Natural Color Enhancement...

Beta Carotene maximizes the color potential in your reptiles.



Unique...

No other reptile vitamin available today compares to the *quality, comprehensive capabilities and overall nutritional value* of Herptivite.



The Choice of Professionals!



HEATING

Repticare®
Rock Heaters



Reptitherm®
Under Tank
Heaters



Repticare®
Ceramic Heat
Emitters



Complete Line
of Hoods



Repti Heat Cave



HEATING ACCESSORIES

Reptitemp Thermostats

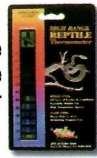


Reptitemp Rheostat

Repti Porcelain
Clamp Lamp



High Range
Reptile
Thermometer



Precision
Analog
Humidity
Gauge



Precision
Analog
Reptile
Thermometer

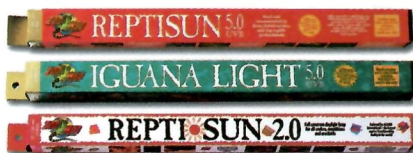


Deluxe
Min/Max
Thermometer



LIGHTING

Reptisun 5.0 UVB
Iguana Light 5.0
UVB & Reptisun 2.0
Fluorescent Bulbs



Repti™ Basking Spot Bulbs



Repti™ Infrared
Spot Bulbs



Daylight Blue
Reptile Bulb



Nightlight Red
Reptile Bulb



VITAMINS AND LIQUIDS

Reptivite® Reptile Vitamins



Avian
Plus® Bird
Vitamins



Wipe Out 1
Terrarium Cleaner,
Wipe Out 2
Hot Rock Cleaner &
Wipe Out 3
Hand Cleaner



Mite Off
& Tick Off



Arboreal
Food
Clip

TERRARIUM ACCESSORIES



Arboreal
Lagoon



Lizard
Ladder



Repti Hammock

Repti Rock Water Dish



Habba Hut



Repti Bark



Terrarium Moss



Repti Sand

FOODS

All Natural
Iguana Food



Aquatic Turtle
Dry Food



Box Turtle/
Tortoise Dry Food



Hermit Crab
Dry Food

Repti Cricket



Canned Reptile Food

CAGE FURNITURE & MISCELLANEOUS

Repti Flora



Reptile Habitat Kit



Iguanariums

Premium Sand Blasted Grapevine



Repti Insulator
Terrarium Background



Repti Mania



Reptiles &
Amphibians
of the
World
Poster

Zoo Med – When Quality Counts!

Zoo Med Laboratories, Inc • 3100 McMillan • San Luis Obispo, CA 93401 USA • (805) 542-9988 • FAX (805) 542-9295 • e-mail: zoomed@zoomed.com • <http://www.zoomed.com>

the VIVARIUM

Volume 8 Number 5



26

In This Issue

Features

Captive Breeding of the Fijian Banded Iguana at the San Diego Zoo by John Kinkaid 26

The Leaf-tailed Geckos of Australia: *Saltuarius* and *Phyllurus*, Natural History and Taxonomy, Part One: *Saltuarius* by Robert Porter 32

Keeping and Breeding the Amazing Chacoan Monkey Frog: A Photo Essay by Philippe de Vosjoli, Robert Mailloux and David Travis 38

Mice in the Attic, Snakes in the Basement: A Visit with Steve Hammack by Randall L. Gray 44

Popular Arizona Natives in Herpetoculture, Part 1: Rosy Boas by Petra Spiess ... 54

Columns

Turtles & Tortoises

How to Repair and Hatch Damaged Turtle Eggs by Sean McKeown 6

Chameleons

Diets for Large Chameleons by Philippe de Vosjoli 8

Bearded Dragons

Bearded Dragons: Questions and Answers by Philippe de Vosjoli and Robert Mailloux 14

Ethnoherpetology

Herpetoculture, Biodiversity, and Bio-integration by Stephen W. Bullington 16

Monitors & Tegus

Controversies about Rodent diets for Savannah monitors by Michael Balsai 18

Herpetological Medicine

Pinworms: Friend or Foe? by Roger Klingenberg, D.V.M. 23

Colubrids

Natural History and Captive Husbandry of the Mexican Milk Snake, *Lampropeltis triangulum annulata* by Thurgess Cranston . 48

Herpetological Photography

Camera Mounted Flash Photography by Jim Bridges 51

Vivarium Design

Planted Vivarium Modules: A Revolution in Herpetoculture by Vivarium Research Group, Inc. 74

Departments

Letters to the Editor	9
Herp News	10
From the Publisher	12
Herp Events	13
Herp Products	20
Book Corner	21
Classifieds	56
Marketplace	62
Advertiser's Index	67
Upcoming Events	70
Veterinary Directory	73
Herp Horizons	77

PRESIDENT

Philippe de Vosjoli

PUBLISHER

Vivarium Publishing Group, Inc.

STAFF

Editor

Susan Donoghue, VMD, MS, DACVN

Associate Editor

Sean McKeown, MA

Marketing Director

Gigi

Art Director

John C. Manor IV

Distribution Director

Lina Khoury

CONTRIBUTING WRITERS

Michael Balsai

Ellin Beltz

Jim Bridges

Bob Clark

James Hatfield

Roger Klingenberg, DVM

Bill Love

Thurgess Cranston

Jack Therhac

Kevin Wright, DVM

ADMINISTRATIVE STAFF

Classified Ad Coordinator

David Shultz

Accounting

Peter Sciumbata

Manufactured and Printed in the United States of America.

THE VIVARIUM, (ISSN 10472665) is published six times a year January/February, March/April, May/June, July/August, September/October and November/December issues. Subscription price is \$28 for U.S. and \$36 for all foreign countries per year. Published by American Federation of Herpetoculturists, 120 W. Grand, Ste. 106, Escondido, CA 92025 Telephone: (760) 747-4948. Periodical Postage Paid at Escondido, CA and additional mailing offices. **POSTMASTER: Send address changes to THE VIVARIUM, P.O. Box 300067, Escondido, CA 92030-0067.**

Copyright 1997 by the Vivarium Publishing Group, Inc., P.O. Box 300067, Escondido, CA 92030. All rights reserved. No parts of this publication may be reprinted without the written permission of the Vivarium Publishing Group.

No responsibility is assumed for unsolicited contributions. Manuscripts, queries, photos, etc., are not returned unless accompanied by an addressed return envelope with proper postage. The Publisher reserves the right to edit or reject any advertisement.

The Vivarium assumes no responsibility for the quality of the products or the animals advertised herein.

Volume 8 Issue 5 May/June



32



38



54



74

Cover: Chacoan Monkey Frogs. Photo By Jack Therhac.



At BUSH HERPETOLOGICAL SUPPLY we can turn your dreams into reality. We offer the most complete line of Herpetological goods on the market, including ABS plastic cages by Neodesha Plastics, the standard by which all other cages are measured. From the 12" starter cage to the 96" python enclosure we have housing to accommodate any size and type of animal. This combined with expert husbandry advice and *guaranteed customer satisfaction*, make us the leader in our field.

CAGE FEATURES:

- Durable, ABS plastic construction, built to last a lifetime.
- Easy to heat, virtually any heating device works nicely.
- Lightweight, a fraction of the weight of glass or wood enclosures.
- Waterproof, water will not be absorbed by the cage, or leak out onto the floor. The cage will never swell.
- No cracks or crevices, mites have no place to hide.
- Cages can be completely submersed for disinfection purposes.

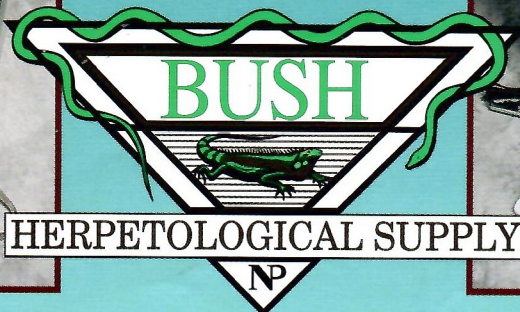


Now available: 3 high, 36" rack.



When you think of Herpetological Supplies think of BUSH HERPETOLOGICAL SUPPLY, The Industry leader.

More Zoos turn to Bush than any other source, and you should too!



P.O. BOX 539 • NEODESHA, KS 66757 • (800) 451-6178
In Canada, Call INDIAN RIVER REPTILES at (705) 295-4014



Check out our Web page at <http://www.pythons.com>

How to Repair and Hatch **DAMAGED** Turtle Eggs

by Sean McKeown
All photos by the author



d tortoise (Geochelone carbonaria) at several months and egg.

Occasionally during the egg laying and deposition process, damage to the shell of a turtle or tortoise egg may occur. The shell may be cracked during laying, as it drops from the female's cloaca into the nest hole, or damaged later, as it is being removed for artificial incubation. If the yolk portion of a cracked egg has escaped injury, it may still be hatchable. So don't throw away a cracked egg — repair it!

First, tend to the other eggs in the clutch. Remove the undamaged eggs and set them up for incubation. Using a No. 2 pencil, place an "X" on the portion of each shell facing upward. Next, lightly clean each of the undamaged eggs with lukewarm water and a moistened paper towel. The goal is to remove any sticky fluid that may have leaked from damaged eggs onto these eggs, because the fluid encourages bacteria and insect predators. Following this cleaning, place the undamaged eggs together into a container with your pre-

ferred incubation medium. Plastic containers should afford minor air flow. Then place the containers inside a reptile egg incubator.

Prepare a separate smaller plastic container for the damaged egg. First, clean the container by washing with hot water, rinsing well, and drying. Next, use an ice pick to make small holes in the container lid. Then, place about one inch (25 mm) of



Galapagos tortoise hatching cabinet at the San Diego Zoo.



Sequence of repairing, then setting up a damaged Red-footed tortoise egg at the Honolulu Zoo.

vermiculite, which has been slightly moistened with lukewarm water, into the bottom of the container.

Now you are ready to repair the damaged egg. Pick it up by cupping your hand gently under it and evaluate the extent of damage to the shell. If the damage is relatively minor, use a slightly moistened paper towel to gently remove any liquid that has dripped out of the egg as well as any attached earth and debris. If you determine that the egg has major shell damage, proceed with even greater caution, using a moistened cotton swab to remove leaking liquid and attached debris. However, avoid the crack line if you suspect additional cracking may occur by minor pressure from cleaning.

Next use a ruler to measure the damaged area. Record the approximate length and width of the shell damage. Then, using a clear plastic sandwich bag or something similar, cut out a section of plastic which is .25 to .5 inch (6 to 13 mm) wider than the affected area of damage.

Place the section of plastic onto the damaged portion and adjacent .25 to .5 inch (6 to 13 mm) area of shell. Very gently, hold the plastic in place with your fingertips. Next, using a cotton swab, apply a light coating of petroleum jelly such as Vaseline® to the edge of the good portion of the eggshell, where it meets the clear plastic. Spread the petroleum jelly over the edge of the plastic as well. This will hold the transparent cover in place by creating a seal and will minimize leakage of fluid. The cover may also limit undesirable bacteria from entering the damaged portion of the egg.

Next, you are ready to set the repaired egg in its incubation container. Create a depression in the vermiculite with your thumb, and place the egg in the depression. Be certain that the depth of the depression is shallow enough so that the entire damaged area and clear plastic over it is above the level of the vermiculite.

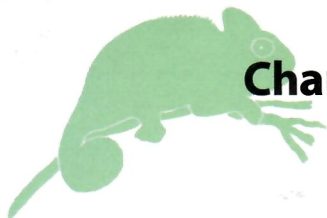
If more than one egg was damaged, use a separate container for each. This will prevent a single egg that has gone bad from negatively affecting the others.

Be sure to open each container and monitor the damaged egg(s) at regular intervals. Once the lid to the container is removed and if there is no putrid smell or only a little negative odor, continue to incubate.

An egg that continues to have occasional minor fluid leakage may need additional cleaning from time to time. Use a cotton swab to remove the fluid that leaks out onto the shell. The clear plastic patch will need to be replaced each time this procedure is undertaken.

Any egg which, simply put, smells awful should be removed. Carefully open the foul smelling egg out-of-doors, to determine whether or not it was fertile. If fertile, note the degree of development before the embryo died. This may offer additional clues for treating future damaged eggs.

About the author: Sean McKeown worked for over 20 years as curator of reptiles at the Honolulu Zoo and Chaffee Zoological Gardens where he pioneered management and breeding techniques for rare tortoises. He is currently director of Diamond Head Publishing, Inc. in Los Osos, California. 



Chameleons

Diets for Large Chameleons

by Philippe de Vosjoli

We are a far cry from having solved the problems of long-term, high-longevity diets for true chameleons. For one thing, the only true test for the effects of diet on longevity is to feed diets under controlled, experimental conditions for long periods. However, maintaining large experimental groups of chameleons long-term is expensive and labor intensive. In addition there are so many variables, including interactions between variables, that need to be examined, that useful results could take as long as ten years to uncover. For the chameleon keeper who is concerned with the welfare of a pet currently in his or her possession, waiting for the results of any such experiments is a moot point.

For keeping the larger species of chameleons there are several, sometimes opposing, schools of thought which are summarized as follows:

1) Commercially-raised gray crickets may form the dietary staple of large chameleons as long as the invertebrates are maintained in clean enclosures and fed a high quality diet such as mustard greens, kale, grated carrots, orange slices, flaked baby cereal etc..

2) Gray crickets are not a good choice as a dietary staple for large chameleons and long-term consumption can lead to a variety of diseases and shorten potential longevity. A mixed diet which focuses on commercially-raised roaches, silkworms, and field-collected grasshoppers is preferable if not essential for longevity and good health.

3) Over-supplementation with commercial vitamin/mineral supplements, no matter what the diet, may reduce longevity.

4) Plant matter should form a signifi-



A male Oustalet's chameleon having just captured a subadult panther chameleon. Photographed in the field by the author.

cant component of the species known to eat plants such as *Chamaeleo calyptratus*.

Most chameleophiles aim for a middle ground, which focuses on gray crickets as a significant part of the diet unless other insects are available readily or can be raised easily. Only moderate supplementation, once a week, for mature adults is given as long as the insects are fed a high quality diet.

There is another consideration which is often ignored; large chameleon species will occasionally eat vertebrates and these may be a significant source of vitamins A and D₃. As recently presented by Ardi Abate of the Chameleon Information Network and confirming what we had discovered in Madagascar, Parson's chameleons (*C. parsonii*) will readily consume small birds when given the opportunity. Considering the niche of Parson's chameleons — taller trees in primary forest — the probability of encountering small birds is significant. Olaf Pronk,

Continued on page 68



A Parson's chameleon eating a day gecko. Photo by James Martin

Regulating Herps

To the editor:

I am writing about the "Scientists' Letter to Al Gore." By the time this is printed, this letter will have been given to the Vice President by a team of biologists. It urges him to establish a commission to recommend new strategies to "prevent [my emphasis] and manage invasions by harmful exotic species." I believe that if this commission is established, it could have devastating effects for the future expansion of herpetoculture.

The letter was posted on several listservers for professional biologists in late February, in an effort to get additional signatures before a March 14 deadline. I talked to one of the people who drafted the letter, Dr. Donald Schmitz, in early April. He said that 527 scientists had signed. At that time, it was hoped the letter could be presented to Vice President Gore at a special ceremony in early May.

Dr. Schmitz was very cooperative in providing information. He said that the main thrust of the proposed commission would be to limit access to exotic species whose introduction would have "ecosystem-level" impacts. According to him, most of these species would be plants. He specifically said that the idea was not directed against small, commonly-kept pets such as herps, arachnids, myriapods, or even tropical fish. Dr. Schmitz and two other individuals have outlined these ideas in a forthcoming book, *Strangers in Paradise*.

The problem is that I read the final version of the letter very carefully, and it is much more general in its wording than the way Dr. Schmitz explained over the phone. If a commission were set up using the present language as a guide, it would easily have the authority to require permits for all captive exotics. I do not think this will ever happen. But to give this kind of power to any governmental organization is a mistake. And with its emphasis on a vague "prevention," a commission in my opinion would eventually ban all exotic imports, under the guise of "better-safe-than-sorry."

I don't think I am being paranoid. We just missed by the narrowest of margins having commerce in giant millipedes and centipedes removed from the private sector via a permit system, and we may not be "out of the woods" yet. These myriapods were not proposed for regulation because they were pests or even because they had any chance of becoming established in the United States. They were proposed because some bureaucrats thought that if no one looked too closely they **could** be regulated, and these people decided that it was in the best interest of their organization that they **should** be. Only a write-in campaign to several U.S. Senators has so far prevented their success.

Like the bureaucracy in my example, a commission would have imperatives unrelated to meeting real public needs. Once established, it would have to produce "results" to justify continued funding. As not much can be done to counter the spread of entrenched pests, inevitably the emphasis would switch to "prevention" and lecturing about the "evils" of exotics. Explicit language concerning this possibility is even part of the scientists' letter. I quote:

*"One can imagine, for example, a center analogous to the Centers for Disease Control and Prevention (CDC), a high-level government office (like that of the Surgeon General) that might serve as a **bully pulpit** [my emphasis], a much-expanded and well-funded interagency task force, and numerous other possibilities."*

In this kind of polemic atmosphere it would be a miracle if the ideas "captive exotic species," "invasive

exotic species," and "invasive exotic species with ecosystem-level impacts" did not become confused in the public mind (they are fairly confusing even when written out). The first have no ecological impact; the second, none to speak of, at least to the majority of people living with them; and the third, a major impact on the entire ecosystem and its economic uses. The old terms for these three categories were captives, naturalized species, and pests. The problem for us is that many conservationists define all naturalized species as "ecological pests," and all exotic captives as potential naturalized species. Given this widespread attitude, commission "results" could easily come to mean "number of species banned."

So in a very real way, it is irrelevant what Dr. Schmitz or the other framers of the letter intend. It is very unlikely that any of these people will be on the commission. And once it is established, it will do what it wants if not restrained in some way by law. Besides the organizational imperatives referred to earlier, pressure will all be towards tighter controls. Animal rights, deep ecology, and other fringe organizations will constantly barrage the commission with requests. But most importantly, the commission will be staffed by scientists whose first loyalty is to their own government-sponsored colleagues. Tighter controls will mean more government-funded projects, and more power by scientists over who can and who cannot keep exotics (something many of them have been wanting for a long time). Even given that many or perhaps most of the scientists would initially try to be even-handed and fair, peer pressure and self-interest would, in the end, dominate.

Therefore, I strongly disagree with the idea of establishing a commission focused on preventing introductions of "non-indigenous species." This focus is too open to abuse. I agree with Dr. Schmitz that some plants and a few animals (e.g., zebra mussels, gypsy moths, clawed frogs and brown tree snakes, etc.) have significant ecosystem-level impacts and should be controlled. Perhaps if the focus of the proposed commission were narrowed to combating "economic pests", the idea would be more palatable. Even there, I think we would be wise to make sure that any commission that is established includes representatives from the pet industry. In any event, we need to keep a very close watch on what comes of the "Scientists' Letter." We also need to be prepared to take political action if the sequel is not to our liking.

Stephen W. Bullington, Ph.D.
Falls Creek, PA



In Business for over 30 Years

SCOPE CO., LTD

- High Quality Animals Only
- Rare Species
- We'll purchase any item of Reptilian and Amphibians
- Information Wanted

Tokyo Okayama Osaka
Takamatsu
tel/fax 087 0833 9424 Japan





TOP HAT CRICKET FARM, INC.

'We Are Distinguished From The Rest'

Serving the Bait and Pet Food Industry Since 1954

Guaranteed Live Delivery throughout the continental United States

Special Handling and Packaging is our Specialty

ACCEPTING VISA, MASTERCARD, AND DISCOVER
FOR PRICE INFORMATION CALL OR WRITE:

1919 FOREST DRIVE
KALAMAZOO, MI 49002
800-638-2555
FAX 616-327-1120

CRICKETS
MEALWORMS
SUPERWORMS
WAXWORMS
HIGH-CALCIUM CRICKET FOOD
DISPLAY CAGES

Carolina Mouse Farm




728 Cannon Road
Salem, SC 29676
864-944-6192 Voice/Fax

Mice & Rats

'Providing Quality Rodents at Wholesale Prices'

All Sizes, All Year

Website: <http://www.herp.com/carolina/carolina.html>
E-Mail Address: Carolina@herp.com

DROSOPHILA

FRUIT FLIES

FLIGHTLESS
or WINGLESS

Excellent food source
RELATED DROSOPHILA MATERIALS
CULTURE JARS, VIALS, MEDIUMS MITE
POWDERS, MOLD INHIBITORS ETC.

24 hour fax
954 978 5591
Prompt Service
USDA Approved
1 800 545 2303

Herp News From Around the World

by Ellin Beltz

Herps squash Info Highway to Silicon Valley

In a twist on the age-old tale of herps smashed on the road, two endangered herps put the brakes on a new fiber optic cable installation to Half Moon Bay, CA. The red-legged frog (*Rana aurora*) and the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) live in the huge Crystal Springs Reservoir bisected by the road and

the copper phone wires and so county, state, and the San Francisco water district all had to sign off on the environmental and endangered species issues for the new cable. The bay is in an area isolated by the ocean, the mountains and the reservoir, but it is close to Silicon Valley. The demand for high-speed frame relay connections is putting a lot of pressure on the phone company to resolve the issue. For now, more copper wire is being slung on poles. A computer programmer who recognizes the importance of the environmental issues said, "The day you can manufacture a red-legged frog as easily as you can manufacture fiber-optic cable is a long way off." [*San Francisco Chronicle*, February 10, 1997 from Matthew and Laurie Aikawa].

"Komodophthalmologist?"

A veterinary team in Springfield, VA apparently successfully removed a cataract from the eye of a female Komodo dragon on breeding loan to the U.S. National Zoo from Ueno Zoo in Tokyo. It is the first time this procedure has been done on *Varanus komodoensis*. The veterinary ophthalmologist said that "Muffin" shouldn't have pain or side effects from the procedure and will be able to see clearly a day or two after surgery. [February 6, 1997: *San Francisco Chronicle*-Jack Corning, Matthew and Laurie Aikawa; *Telegram and Gazette*-Christopher J. Knuth; *Jefferson City Post-Tribune*-Vicky Elwood; *The Washington Times*-Bill Messer; *The Roanoke Times*-Susan Donoghue] The background of the photo shows that this may also be the first surgery on a Komodo dragon recorded by at least four different photographers; still and video!

Tortoise ultrasound

A veterinary radiologist recently did an ultrasound examination on the Kansas City Zoo's female Aldabra tortoise and found that the

300-pound (136 kg) 60-ish "Daisy" is developing eggs. Hatchlings of this species are reported to be rare in captivity with the last birth being recorded seven years ago at the Atlanta Zoo. [*Kansas City Star*, February 27, 1997 from Vicky Elwood].

Nothing threatens New York toads

Thousands of endangered Wyoming toads were bred in hatcheries ranging from Colorado to New York City's Central Park branch of the Bronx Zoo (Wildlife Conservation Society) and — in "an amphibian version of Pickett's Charge" — were released in Rocky Mountain National Park, according to the *San Francisco Chronicle* which added, "The risk is clear, but researchers argue that it's time to abandon scientific caution. The toad cannot afford to wait any longer for an answer to why it is being killed off in the Colorado mountains." Some toads have been radio tagged and others have been pit tagged to help researchers determine where they go and what they do. One reports that of the 104 released, 54 were found later in the season, so whatever is or was endangering the Wyoming toads elsewhere wasn't getting the repatriates. Some of the native New York Wyoming toads were moved to their namesake state, more are breeding in Central Park and are on display at the Conservation Center. [*WCS Members News* Winter 1996-1997 from Michael Perez].

"Golden Gator" captured

An associate curator of the San Francisco Zoo caught the 7-pound (3 kg) 3-foot (0.9 m) long alligator swimming in Presidio Mountain Lake with a fishing pole and some raw fish. [*San Francisco Examiner* October 9, 1996]. A couple of months later, Goldie was not drawing the crowds anymore. Zoo officials planned to send him and Antoine LeBlanc, the 6-foot (1.8 m) white gator they borrowed from the Audubon Zoo in New Orleans back to the bayou, but discovered that Antoine had outgrown his shipping crate! [December 4, 1996 both from Grizzley Gibson].

Two countries, two systems

"An alliance of 33 tortoise-loving Members of Parliament has protested to the Swedish authorities after the [latter] froze 1,000 illegally imported specimens to death. The animals were destroyed despite offers from both the British-based Tortoise Trust and the SAS air to cover the cost of returning them to Tadjikistan... The Swedish Charge d'Affaires in London... said there was no rescue-centre in Sweden willing to take the animals [*Testudo horsfeldii*] and they were not fit for transportation," according to *The Independent*. [December 11, 1996 from Mark O'Shea].



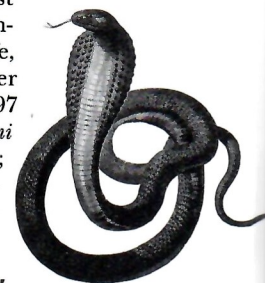
line

It all began at the airport late last year, when a British citizen flying in from Hong Kong was discovered to have hundreds of baby star tortoises in his carry-on luggage. Then on Janu-

ary 22, 1997 the Government of Canada "announced that 105 of the 232 Indian star tortoises that were smuggled into Canada from India will be transported to a new home in the United States... [the baby tortoises] were discovered ... by Customs Canada and Environment Canada officials... [they have an] estimated retail value of as much as \$250,000 Canadian." The babies were sent to a US zoo which will distribute them to several zoos in the states that are breeding the species. [News release January 22, 1997] The smuggler pleaded guilty to importing the tortoises without a license, was fined \$10,000 (Can.) and deported. [*The Toronto Star*, January 23, 1997 both from Wes von Papineau and Kimberley Heaphy].

Cobras, \$12 a day!

An entrepreneur in Harare, Zimbabwe has been capturing wild Egyptian cobras, putting them in the homes of people who are away on vacation, and posting signs and drawings (for illiterates) in an effort to deter burglary which is reportedly rampant in this African nation. However, the Zimbabwe Herpetological Society and the Society for the Prevention of Cruelty to Animals opposes this use of the species for obvious reasons, and contributor Steve Durrant of the ZHS suggested one I didn't think of — what happens if you can't find all the loose cobras when the owner comes home? Curiously, the entrepreneur claims a bachelor of science in herpetology from Illinois State University and says that the campus he attended is the "one near Boston." *The New York Times* reports: "If that can be overlooked, he has other distinguishing marks of a snake handler — two tattoos and evidence of four bites, the last of which cost him half his index finger... He said, 'My wife, uh, tolerates me over this.'" [February 9, 1997 - Bryan Lorber; *Miami Herald*-Alan Rigerman; *San Francisco Examiner*-Matthew and Laurie Aikawa].



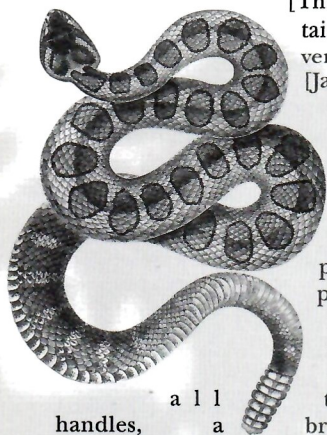
\$5,000 cobra, one day

Regular readers may remember the story of "Tut" the 2-foot (61 cm) Egyptian cobra lost whilst sunning one day across the street from a grade school. It was a three-day sensation until two fourth graders saw the cobra in school months later and it was taken away by authorities without further incident. Hopefully the final 15 minutes for this story comes from the Worcester, MA *Telegram and Gazette*. "The Stoneham owner of an Egyptian cobra that escaped last summer has been fined \$5,000 for violating wildlife protection laws." [February 27, 1997 from Christopher J. Knuth].

Venomous snakes, \$5,000 a day (minimum)

"Slade, KY snake expert James Harrison sur-

vived his tenth venomous [snake] bite, in part by staying conscious long enough to tell doctors how to administer his own antivenin... [the] founder of the Kentucky Reptile Zoo... was bitten on the thumb... while extracting venom from a five-foot adult Cape cobra... [He] has been handling snakes for 21 years and has already lost part of a finger to one of them. 'The odds catch up with you eventually,' he said... [He] had milked about 40 snakes... when he picked up the South African cobra...



[The Zoo]... maintains 80 species of venomous snakes" [January 7, 1997 *The Courier-Journal*, Kentucky from Gary H. Kettring]. Harrison had done everything possible to prepare for snake bite including having a written protocol, antivenin for the species he

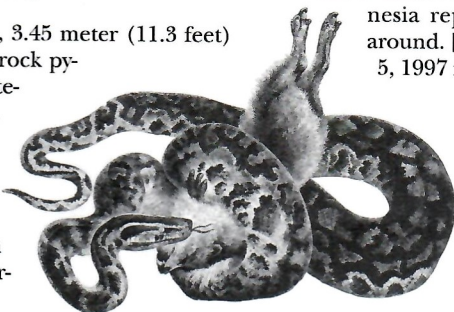
handles, a brother close by who is equally well informed on venomous snakebite available to medical personnel, an assistant to drive him to the hospital, and the coolness of nerve to put the snake away properly before leaving for treatment. [Dayton Daily News, February 8, 1997 from Brian Menker].

A Jacksonville, FL man was bitten by a 5-foot (152 cm) diamondback rattlesnake and was in critical condition after having been transferred from the local hospital to the University Medical Center. The 35-year-old man told an animal control officer that he was milking venom from the snake "because it is worth a lot of money." The officer did not know if the man "had any experience in milking rattlesnakes," according to the *Miami Herald*. [January 25, 1997 from Alan W. Rigerman].

Happy pythons

Firefighters had already found the dog — dead in the ashes of a totally destroyed home in Manteca, CA when they found the family Burmese coiled up in the remains of a closet. The fire Battalion Chief said "It was kind of funny. It reminded me of that movie *Raiders of the Lost Ark*... I could just hear our guys saying 'Why does it have to be a snake?'" [The *Oakland Tribune*, November 3, 1996 from Matthew and Laurie Aikawa].

A 20-year-old, 3.45 meter (11.3 feet) female African rock python had a vertebra crushed when it was run over by a car. So far, no news. What's new though is that an orthopedic sur-



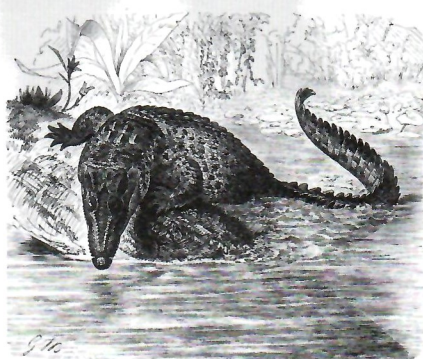
geon and a veterinary surgeon collaborated to repair the break at the 112th vertebra. The snake is expected to make a recovery from its injuries. South African rock pythons (*Sebae natalensis*) have 306 vertebra and 268 ribs, otherwise its spine is similar to other vertebrates — including humans. The species is in the process of being listed as endangered in South Africa. [Natal *The Cape Times*, January 22, 1997 and *The Toronto Globe and Mail*, January 23 from Wes von Papineau and Kimberley Heaphy].

Taxes, a croc?

The curator of Egyptian papyrus documents at the Hearst Museum in Berkeley, California is one of five team members in a nationwide project to decipher thousands of tax records and other "junk paper" found inside mummified crocodiles sent home from an 1899 archaeological dig. It is reported that the papyrus documents were discovered when one crocodile accidentally broke open revealing the Egyptians' recycling scheme. [Oakland *Tribune*, December 11, 1996 from Matthew & Laurie Aikawa].

Crocodile redundancy

Only 13 people have been killed, and another 20 survived saltwater crocodile attacks, in Australia over the last 25 years since the Northern Territory government banned hunt-



ing. *Crocodylus porosus* is the largest of the crocodile species on earth, but were no match for human hunting improvements. In 1971, there were only 5,000 left. They now number about 70,000 and are beginning to impact human activities again. "Salties" have been reported from suburban parking lots to urban beaches in Darwin and even invaded the popular swimming holes in the Kakadu National Park where scenes of "Crocodile Dundee" were filmed. Recently an engineer on an oil rig 120 miles out in the Timor Sea between Australia and Indonesia reported seeing a salty lurking around. [The *Wall Street Journal*, February 5, 1997 from Susan Donoghue].

Just get the Sweetwater Jaycees...

The \$1 million proposed by the Interior Department to study and capture brown tree snakes (*Boiga irregularis*)

on Guam ran into a "wise-use" counterproposal to pay local kids on the island \$1 per snake to capture this venomous species. The Senator who made the proposal said that the department had "misguided spending priorities." The Interior Secretary replied that "The brown tree snake is a major disaster looming across the Pacific, pointed at Hawaii and perhaps the southern United States. The entire island [of Guam] has been overrun. Bird species are going extinct. They are everywhere, shorting out power lines, coming in through plumbing systems. It's a mess." [Jefferson City *Post-Tribune*, February 27, 1997 from Vicky Elwood].

Joy of Living

The recent flap over the recipes for sea turtles in famous US cookbook *Joy of Cooking* sent me to my copy of the first edition, published before the Endangered Species Act. Sure enough, there was the offending section, insensitive remarks about cutting off the shell, recipe for sea turtle soup and all. The representative of the Sea Turtle Survival League who was quoted on the *Reuters Newswire* said that they have contacted the publisher of the highly successful book, but have received no reply. [January 7, 1997 from Wes von Papineau and Kimberley Heaphy].

"Nicaraguan authorities have banned the eating of the threatened green iguana, the main ingredient in a favorite Holy Week dish. Each year just before Lent, the reptiles are hunted in the wild and killed, to be cooked with vegetables and ground corn... the ban is intended to prevent the slaughter of the iguana at the height of its reproductive cycle," according to the *San Francisco Chronicle*. [February 8, 1997 from Matthew and Laurie Aikawa].



Thanks to everyone who contributed to this column and to Mark Paul Henderson, Alan Rigerman, Alan Tuley, F. Castro, P.L. Beltz, M. Pilotte, and government of Canada for its continuing support of herpetological news services, as well as five new contributors. You can contribute, too! Please send the whole pages from newspapers or magazines including date/publication slug with your name on each sheet to me at the address on the masthead. All contributions will be acknowledged in upcoming columns. Nice letters only to <Ebeltz@neiu.edu>.



What's New and Upcoming at The Vivarium

This issue marks a turning point for *The Vivarium* magazine. Following negotiations with the American Federation of Herpetoculturists, *The Vivarium* has been purchased and will now be managed by the Vivarium Publishing Group, Inc. The American Federation of Herpetoculturists will continue to exist as a nonprofit organization whose primary goal is to represent the views and interests of herpetoculturists. *The Vivarium* will continue to support the AFH by making space available for any articles or notices by AFH members and staff.

The Vivarium has undergone changes since its inception and more changes lie ahead. The goals of *The Vivarium* will be to emphasize the original intent of the publication: the captive husbandry and propagation of amphibians and reptiles. Consequently, you will see more practical how-to articles on herpetoculture. Another goal is to present information of interest to all herpetoculturists. Thus, we will have either articles or columns on the following topics: Boas and/or pythons, colubrids, geckos, chameleons, iguanas, turtles, amphibians, herpetological medicine, vivarium design, mini book reviews, ethnoherpetology and a travel section in every issue. We call it our

EFI (every fabulous issue) guarantee. In addition, we will feature pieces on a variety of topics, from travelogs to giant skinks, from controversial views on legislation and conservation to snakes and other herps in myth.

Starting with this issue, you will be getting more pages, more color and more photographs. *The Vivarium* also has a new web site under construction which will be updated on a regular basis. Check us out at www.vivarium.com.

We also now have new staff members.

- Dr. Susan Donoghue, starting with issue 8.2, is the new editor of *The Vivarium*.

- John Manor, starting with issue 8.4, is our new art director and production manager.

- Lina Khoury is our new distribution director.

- Sean McKeown, a former editor and a great supporter of *The Vivarium*, is back with us as associate editor.

- James Hatfield III, author of the highly acclaimed *Ultimate Iguana Owner's Manual*, starting with issue 9.1, will be our iguana column editor and writer.

- Ardi Abate of the Chameleon Information Network, starting with issue 8.6 will be the writer and editor of the chameleon column.

We think you will enjoy our emphasis on

herpetoculture with our primary goal being to provide a wealth of practical information for all herp hobbyists. We also want *The Vivarium* to be a forum for an exchange of ideas on all aspects of ethnoherpetology, the interrelationships of humans & amphibians and reptiles.

ATTENTION ALL AMPHIBIAN AND REPTILE BREEDERS

Now is the time to submit photographs and articles for our end of the year 1998 Cutting Edge of Herpetoculture Issue!

Our 1997 Cutting Edge Issue was the best selling *Vivarium* of all time with record advertising and distribution.

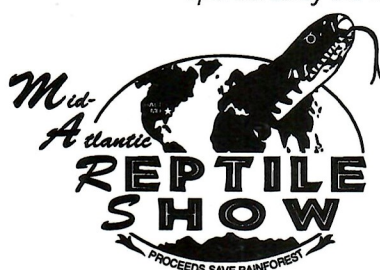
Send slides of animals which you feel are new or at the cutting edge of herpetoculture for consideration in our 1998 Cutting Edge Issue. We already have new spectacular morphs of the New Caledonian giant gecko, collared lizards, monitors and frog species lined up, and it's only June. If your entry(ies) is accepted, the photo(s) will be published along with a byline referring to you or your company. Your name or your company name will then appear in the breeder's directory of our cutting edge issue. This is a unique and effective means of advertising the special animals you are working with.

SEND SUBMISSIONS TO:

The Vivarium
P.O. Box 300067
Escondido, CA 92030-0067
SAMPLE CUTTING EDGE 1997 ISSUE IS \$10.00

MID-ATLANTIC REPTILE SHOW '97

Sponsored by the Maryland Herpetological Society



September
13 & 14, 1997

Saturday 10:00 a.m. to 4:00 p.m.
(Lectures 7:00 p.m. - 11:00 p.m.)
Sunday 11:00 a.m. to 5:00 p.m.

Guest Speakers: Dr. Fredric L. Frye, Dave Barker (VPI, Inc.)
& additional speakers to be announced.

Proceeds purchase rainforest through the Ecosystem Survival Plan, 1,616 acres have been saved since 1993!

Captive-born Reptiles and Amphibians, Equipment & Books for Sale,
Book Signings, Raffles, Door Prizes, Art Displays and Much More!

Location:

Maryland State Fairgrounds 4-H Hall (Show)
Days Hotel Timonium (Lectures)
For reservations call: 800-235-3297

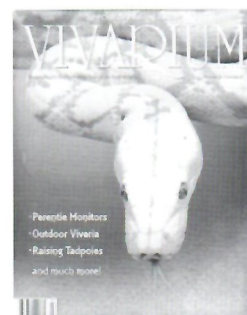
The Maryland Herpetological Society

2643 N. Charles St., Baltimore, MD 21218-4590
Contact Tim Hoen, show coordinator,
at 410-557-6879.

Captive born reptiles only. Vendor sales only. No venomous. Not responsible for damage, theft or injuries.

ERRATA

Oops! We forgot to give credit for the outstanding color photo on the cover of 8.4. The snake is an albino reticulated python (*Python reticulatus*) and was submitted By Bob Clark.



Also, in issue 8.4, the photos of Natal Midlands chameleon (*Bradypodion thamnobates*) and of the Australian water dragon (*Physignathus lesueurii*) were by Sean McKeown.



An Overview of the Biggest Herpetocultural Events of 1997

by *The Vivarium Staff*

The Greatest Herp Show on Earth!

National Reptile Breeders' Expo

August 15-17 1997, with mini Gecko Symposium August 14 th
Radisson Twin Towers Hotel, Orlando, Florida

1997 marks the eighth year for the herp show that started it all., the National Reptile Breeder's Expo, masterminded by Wayne Hill and the Central Florida Herpetological Society. This was the first mega-scale captive-bred only herpetocultural show and it has continued to grow under Wayne Hill's management and grand herpetocultural vision, drawing herp aficionados from all walks of life and from all over the world. This year, the 400+ displays will cover six rooms for a total surface area of 63,256 sq. ft. (at least a day is required to see everything, two to make sure you don't miss anything). The attendance is expected to exceed last year's (8000 people per day, though many attended both days). Two hotels, right next to Hollywood Studios and minutes from a variety of restaurants and Disney World, are fully booked for this event.

What makes this show the most exciting herp event on earth is not only the incredible numbers of animals and products assembled in one place but also the various social events. This year on Friday night a special mini-gecko symposium with speakers from around the world has been scheduled, with profits to benefit the International Gecko Society. Gecko experts Wilhelm Henkel from Germany, Yuri Kaverkin from the Moscow Zoo, Eddie Postma from Holland, Dr. Tim Tyle, Ron Tremper and Bill Brant will speak on a variety of topics certain to captivate all geckophiles. In addition, a number of speakers are scheduled for Saturday night including Mike Talbot from the United Kingdom, Bert Langerwerf (Agama International), Steve and Linda Davison (Sticky Tongue Farms) and Al Baldogo. The Radisson Twin Towers Hotel provides a great setting with food and drinks available 24 hours a day and contributes to making this show a round the clock social gathering unlike anything else of its kind. Where else can you meet exporters from Africa, herpetoculturists from Uruguay or the United Kingdom, importers from Japan or top reptile breeders such as Frank Retes and

Bill Love. For anyone seriously interested in amphibians and reptiles, including business owners, this is a must attend, at least once-in-a-lifetime, mind-blowing event. For everyone else this is a happening so bizarre, otherworldly and of such sensory overload that it is too wild to pass up. It is the herper's Mardi Gras and annual pow wow. There is nothing like it on this planet.

Best Not-Just-Captive-Bred Reptile Shows!

International Reptile Breeders Expo

July 19-29 1997 (150+ booths) and October 4-5 1997 (250+ booths)

San Diego California

See display ad on page 66 for additional show information.

Though they do not boast as many displays, the International Reptile Breeder's Shows in San Diego, the creative offspring of Ray Busby have become favorites for those who are looking for odd species, new species and new approaches to reptile displays. The IRBA show is generally described as smaller, more diversified and less snake focused than the National Reptile Breeder's show because it is NOT a captive-bred only show. It's location in Southern California, an area which is at the origins of much of the cutting edge of herpetoculture make it a place where many of the top breeders and originators of herpetoculture such as Robert Applegate, Robert Mailloux, Vince Scheidt and others gather to display their wares and exchange information. For those of us interested in establishing new species in herpetoculture, this show has played a key role in exposing breeders and members of the public to not-so-standard fare. Lizard hobbyists in particular will find available a wide range of monitors, true chameleons and odd species such as armored skinks, rare anoles, unusual geckos and agamids not found in captive-bred only shows. Amphibian and turtle hobbyists are also certain not to be disappointed.

The shows are run impeccably by their creator Ray Busby and a great deal of emphasis is placed on the professional quality of the displays, such as curtained booths. These west coast shows attract people from all around the world who view these events as opportunities to visit the beautiful city of San Diego as well as other parts of California. There are informative talks and workshops during the course of the shows. Although they are less grand in scale social events compared to the National Breeder's Expo, the IRBA shows have become a favorite of the "not just snakes" and "cutting edge" crowd. In short, they have a little bit of everything for everyone, and then some.

The Mid-Atlantic Reptile Show

September 13-14 1997

Maryland State Fairgrounds.

(For more information, see Upcoming Events, or their display ad on page 12)

One of the greatest herp events in the Northeastern United States is the Mid-Atlantic Reptile Show, held near Baltimore Maryland at the Maryland State Fairgrounds. The show's creator Tim Hoen is an idealist set on saving rainforests and preserving biodiversity. His primary goal, to "give something back to nature," was fulfilled by creating a bridge between herpetoculture and conservation: proceeds from the Mid-Atlantic Reptile Show have been used to purchase 1,616 acres of tropical forest in Costa Rica in partnership with the Nature Conservancy. The show boasts high standards with 160 vendor tables available by invitation only. MARS has become a favorite of many breeders, supply vendors, artists and organizations because of its unique position of catering to the northeastern market. This year's attendance is expected to exceed 7000. In addition to the booths there are several educational displays with an emphasis on conservation. On Saturday night, a series of lectures by herpetocultural authorities including David Barker of VPI Inc., Dr. Fredric Frye, Carleos de Paco (Director of the Nature Conservancy in Costa Rica) and others is scheduled. This is a must attend show for anyone living in the northeast and anyone wanting to get a sense of what is going on in this area of the U.S. Because of its high ideals this is a show we can all be proud of!



Quality Mice & Rats
Pinks Starting at \$20/100
Overnight Shipping
800-722-6102
Bayou Rodents
P.O. Box 238
Centerville, LA 70522-0238
fax: 318-836-5346
Visa/MasterCard/Discover

Bearded Dragons

Bearded Dragons: Questions and Answers

by Philippe de Vosjoli and Robert Mailloux

erally do poorly in captivity. What is your advice?

There are several reasons why baby bearded dragons will not fare well in captivity including diseases such as virus or infection by coccidia or simply, poor husbandry conditions. If baby bearded dragons are healthy to start with and if they are kept properly, they are hardy and generally easy to keep lizards, among the best of lizard pets.

From your description of how you keep

tile full-spectrum bulbs. Some, such as Repti-Glo® (Hagen) bulbs have relatively low UV output but high lumen output. Others, such as ReptiSun® 5.0 (ZooMed) have high UV output speculated to help in the synthesis of vitamin D3 but lower lumen output. We have had good results with many full-spectrum bulbs including the once widely used VitaLite® bulbs. In any case, increase the brightness of your enclosure and you should notice a marked difference in activity, feeding and growth.

My female bearded dragon is only nine months old, but appears to be gravid. Is this normal? What should I do so she can lay? Is she likely to become egg-bound?

Captive-raised bearded dragons may breed as early as six months of age, so it is quite possible that your female is gravid if she was kept with a male. There are several approaches to setting up females for laying. The male should be removed so he does not attempt to breed with her during the laying process, which can be stressful in a small vivarium. In large outdoor enclosures, however, this is usually not necessary. To create an egg-laying site, a simple method is to place soil or a soil/sand mix which is slightly moist at one end of the vivarium so that it forms a mound at least eight inches deep. Another alternative is to place a large flower pot with soil in the enclosure. Just before laying, females will be unusually active and will often dig preliminary burrows before finally digging a real nest hole. Do not disturb the female during the egg-laying process. After laying is completed, offer her food and water the next day. We have never seen a case of egg-binding with a female bearded dragon, although on a few occasions we have had sick and weak females die with eggs. Egg-binding is not usually a problem with this species.

Are greens and vegetables necessary for feeding bearded dragons?

Greens and vegetables are probably more important for bearded dragons than most people realize. In the wild at least 90% of the diet of adult *Pogona vitticeps* consists of vegetable matter. Juveniles tend to be more omnivorous with plant matter only making up about half of their diet. In captivity, the inland bearded dragon is generally drawn to green, red, yellow and other bright colored small objects and will test them by nipping them for edibility. They will do this from the time they are babies. We



A study of adult inland bearded dragons showed that up to 90% of their diet consisted of plant matter. Photo by Philippe de Vosjoli.

The following are answers to questions asked over the phone to us in 1997. They were chosen because they represent common topics of inquiry by bearded dragon owners.

I am a store owner who offers bearded dragons for sale. We have had poor luck with the hatchling animals we have purchased to date. We keep them in a twenty four inch tank on sand with a hot rock and red light for heat. Although we hear that bearded dragons are the lizards of the future, we have found them to gen-

bearded dragons, a common error immediately stands out. Lighting is critical for the well-being of bearded dragons. If all you are offering is a red heat light, then your baby bearded dragons are probably kept too dark. We have found that high lumen output alone can have a significant effect on feeding and behavior in this and a variety of other lizards. For this reason, we do not recommend red incandescent bulbs as a daytime heating source for bearded dragons. Use regular incandescent spotlights. In addition, we recommend fluorescent lighting, preferably rep-

have found that providing greens and other plant matter at all times will reduce the occurrence of intraspecies mutilation common with this species when small animals become hungry. Bearded dragons of all ages will consume some vegetable matter even when crickets are available most of the time. The health benefits of a plant diet when raising bearded dragons has yet to be investigated but reduced protein (most green leafy vegetables), reduced fat and the variety of vitamins provided by plants could play a significant role in extending the longevity of this species in captivity. So, in answer to your question, we feel that providing plant matter is a must.

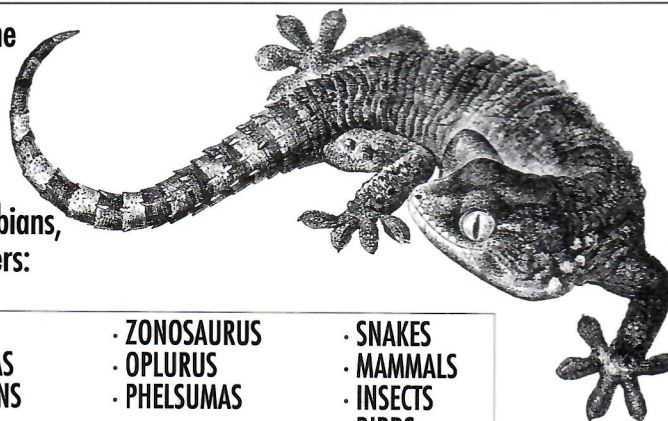
Source Material:

MacMillen, R.E., Auger, M.L. and B.A. Ellis. 1989 thermal Ecology and Diet of Some Xerophilous Lizards from Western South Wales. *Journal of Arid Environments* 16, 193-201.



madagascar

We are one of the biggest export companies in Madagascar. We have the following amphibians, reptiles and others:



- | | | |
|--------------|--------------|-----------|
| • FROGS | • ZONOSAURUS | • SNAKES |
| • BROOKESIAS | • OPLURUS | • MAMMALS |
| • CHAMELEONS | • PHELSUMAS | • INSECTS |
| • LIZARDS | | • BIRDS |

Please contact us for more information
Importers Only

KING MIKE (USA) INC.

20 West 47th Street, Suite 800, New York, NY 10036
Tel: (212) 398-1555 Fax: (212) 391-2536

Captive Bred Wildlife Foundation

<http://www.herptiles.com/cbwf/>
PO Box 515
Portal, Arizona
85632
(520) 558-2458



Jeff Gee
&
Kim Gee

TORTOISES..... Galapagos, Radiated, Spurred, Leopard, Brown, Red-Footed
TURTLES..... Albino Red-Eared Sliders, Amazon Yellow Spot Sideneck
LIZARDS..... Caribbean Island Iguanas, Leopard Geckos
BIRDS..... Emus, Rheas
PYTHONS..... Albino Burmese, Carpet, Children's, Indian, Ringed
BOAS..... Brazilian Rainbow, Dumeril's, Rosy, Argentine, Colombian
MILKSNAKES..... Honduran, Sinaloa, Pueblan, Mexican, Nelson's
KINGSNAKES..... Albinos, Gray-Banded, Mexicana, Blotched, California
RATSNAKES..... Albinos, Trans-Pecos, Texas, Black, Corns, Asian
GOPHER SNAKES.... Albinos, Striped, Pacific, San Diego, Sonoran, Pines
SUPPLIES..... Books, Frozen Rodents, Heat Pads, Probes, Hide Boxes
T-SHIRTS..... Same as our Logo (gray, heavy, 100% cotton, M, L, XL) \$13
PRICE LIST..... Please Send Your Complete Name and Address and 2 Stamps

Complete Line of Quality Herptile and Small Animal Supplies



We specialize in providing our customers with professional, personally researched products.
Learn from our experience!

Visit our Web site at:

<http://www.beanfarm.com>

or e-mail us at: beanfarm@accessone.com

Call for free catalog.

VISA, Master Card, & Discover cards accepted

32514 Ne 77th St.
Carnation, WA. 98014-6701

Phone (206) 861-7964
Fax (206) 333-4205



Herpetoculture, Biodiversity, and Biointegration

by Stephen W. Bullington

Part 2: Specifics

The environment - We start with the most basic concept of all — *the environment*. The term is defined differently in biodiversity and biointegration. Environments have always included two things, a subject (the observer) and an object (the subject's surroundings). In biodiversity, the focus was on the surroundings. The surroundings were assumed to exist independently of the observer and his needs. The observer was not only left out entirely, in some cases he was pushed out forcibly. His interests didn't count. By defining the environment as something separate from people, biodiversity set the environment up to be manipulated.

In contrast, in biointegration the focus is on the observer, the individual person, and his or her needs for interacting with nature. The surroundings are still there, and they are still important. But they are limited in time and space, and viewed through the medium of the observer's specific needs and wants. In short, the environment exists not as something apart from man as a species, or even apart from particular individuals. It is neither more, nor less than what you experience every day. If you think of the environment in a relativistic way, you keep yourself and your interests paramount. This is true no matter what your interests may be.

This new way of looking at things may be hard to grasp at first. Let's illustrate with some examples. We can start by asking the question, "Does the environment, whatever it may be, matter to anyone or anything in the absence of thinking beings, of which we as humans are the prime and perhaps the only example on this planet?" This is the old, "If a tree falls in the forest does anyone hear it?" question reformulated. The answer is "No." The environment is meaningless to us as hu-

mans without our presence to interpret it. As Shakespeare said, "Man is the measure of all things."

So reference to the environment is meaningless without man, in general. What about without men in particular? Do different people live in the same single environment? Once again, no. Referring to *the* environment is a fundamental error. There is no one single human environment. Rather, there are a multiplicity of environments, just as many in fact as there are people.

Someone who lives in an apartment in Spitzbergen, who walks several blocks every morning only to spend the following eight hours at a desk, lives in an entirely different environment than a farmer in Iowa who is out at 5 AM to ride his tractor until sundown. But what is not so obvious is that people who live in the same town or even who work in the same office for most of the day live in totally separate worlds. For one thing, they go home to different buildings at night, with different furniture styles, plants, and decor, and other inhabitants. For another, they bring different attitudes, memories, and expectations to bear, even when in the same room, perhaps even when seated at the same desk, not to mention different abilities and IQ's. These incorporeal, spiritual attributes affect the experienced environment more than its physical attributes. When to this is added the fact that most people in industrialized countries spend their day in a *succession* of man-made environments, eliciting a succession of personal responses, you can begin to see the incredible range of experienced worlds.

Nature - The second major tenet of biointegration is that people are instinctively prone to incorporate some form of nature in their personal worlds. By nature I mean plants and animals. This is not a new idea; in Part 1, I mentioned E. O. Wilson's book *Biophilia*.

Proponents of biodiversity also believe that people need nature. But they miss the entire point of how people need nature, thinking physical needs, such as the purity of the air or water supply, are somehow tied inextricably to the number and variety of existing animals and plants. Since I have thrown out political correctness some time ago, I will say flatly what I think of these claims: they are baloney. Our physical needs can be satisfied easily without what we usually consider as biodiversity. Lovelock (the fellow that

came up with the idea of *Gaia*), for example, said that the world's specific atmospheric make-up is dependent almost entirely upon microorganisms in the sea, and that this composition would not change significantly if there were no life on land.

The real impact of being around plants and animals is not physiological but psychological. We feel better when we are interacting with other forms of life than when we are not, because 99.99% of our history has been spent doing just that. In my mind this makes animals much **more** important than if they were just there to breathe out CO₂. Biointegration is centered around fulfilling these psychological needs.

Indoor environments - The third major tenet of biointegration is that the psychological need for incorporating nature into our daily lives is best fulfilled by bringing it indoors, into the artificial environments in which we spend most of our time. If you look at your own life, even if you are a 'naturalist,' you will be forced to admit that most of your time is spent indoors. This was the reason for defining environments as a personal relation. The definition forces you to look at what you are actually doing and at where you are doing it.

This artificiality of modern life is an opportunity and blessing. As Robert Louis Stevenson said in one of his essays, "... interiors are sometimes as beautiful, often more picturesque, than shows of the open air, and they have that quality of shelter of which I shall presently have more to say." And he wrote before herpetoculture was much more than a fantastic dream. Interiors can now be very individualized indeed. This specificity allows them to better meet the needs of real, one-of-a-kind people. Sightseeing trips have their value, but they can never match this. It is a point that cannot be stressed too much. *Biointegration is principally concerned with improving the indoor, artificial environments in which most people spend most of their time.*

Biodiversity missed entirely this multiplicity of interior environments. It concentrated on sequestering nature from humanity — on setting up *one* outdoors as an idol, with the single solution of "look, but don't touch." It was blind to the needs of ordinary people who had to spend their time in buildings. I would be rich if I had a dollar for every time I had

heard some professional say "Pet owners don't count. These animals need to be controlled." I still hear calls for banning certain types of very popular pets, because they *might* become established in this or that outdoor environment. This attitude amounts to letting the interests of a few government-sponsored researchers 'trump' those of the public at large.

The emphasis in biointegration will be different. It will not be elitist. There, when conflict arises (as it inevitably will), the needs of the many will take precedence over those of the few. Enhancing interior environments will take precedence over preserving exterior ones. This does not mean that we will return to the old philosophy of destroying everything, or of evaluating animals strictly in terms of dollars. Conservation will still have an important place. We are merely getting our priorities straight. Interior environments and everyday people come first.

As a specific example, the right to keep a popular pet lizard might be guaranteed, even though it could escape and become established. I am speaking here only of an animal that would make an excellent pet, not a marginal species that had no real future in captivity. One such lizard, more or less, in the environment would make little difference to outdoors types such as hunters, fishermen, and even bird-watchers. At worst, the *new* animal would only be part of their experience (all of the old parts would still be present). But a particular kind of herp or spider might be most or all of a breeder's 'nature' experience, or the experience of those who buy from him. In a case like this, the needs of pet owners (or potential pet owners) should come first.

Before we move on to the next tenet, we need to place herpetoculture in its proper relation to the main methods of enhancing interiors with nature. At the present juncture in history three such methods are extremely common — potted plants, tropical fish, and typical *real* pets such as dogs, cats, and, most recently, parrots. Few offices are without potted plants or tropical fish, and few homes do not have at least one dog, cat or bird.

Over about the last 20 years, for the first time in human history, people have also learned how to keep and propagate a variety of reptiles, amphibians, and large arachnids. All these animals have several common characteristics that set them apart from *real* pets. First, they are not as

intelligent as, nor can they interact with a human in the same way as a dog, cat or large parrot. Second, they are usually much smaller than most dogs or cats, and consequently live in glass vivaria rather than wandering about the house or yard. This confinement means that, as captives, they are much less destructive to the immediate environment, i.e. to birds in the back yard, compared to pet mammalian carnivores. Third, they are mostly poikilotherms, that is, 'cold-blooded.' Poikilotherms require less time, room, and food than do warm-blooded pets. In other words, these new 'captive' animals have many advantages over traditional pets. Herpetoculture and arachnoculture should therefore be promoted until everyone who could benefit by keeping a reptile, amphibian, or arachnid is doing so.

Sustainability - The last major tenet of biointegration is sustainability. The *integration* in biointegration means nothing without captive breeding. If animals are simply collected and kept, rather than collected and bred, the creatures we value most will soon be extinct or so depleted as to be useless to the average citizen. Since biointegration is for the average citizen, captive breeding is of paramount importance.

In summary, these four tenets define biointegration: 1) an emphasis on personal environments, 2) a tendency to incorporate nature as part of these environments for psychological reasons, 3) a bias towards bringing plants and animals indoors where most people spend most of their time, and 4) an emphasis on the sustainable production of these "integratees" through captive breeding.

The future - Much of what has been written about herpetocultural goals in this magazine has a mystic quality. This quality comes from people knowing instinctively what is needed, but not being able to articulate it. This sort of thing is common when breaking new ground. We *are* breaking new ground.

De Vosjoli (1996) defined *ethnoherpetology*. This was a new term, and it covers much of what I am talking about here. The term biointegration is new too, but differs from ethnoherpetology in that it is more general. It includes many things, from horticulture to keeping tropical fish. If we promote it for what it is we will pick up converts everywhere.

De Vosjoli also mentioned that justifying our activities with conservation wasn't accurate. People always try to justify their activities with what they consider to be noble goals. But we don't need to hide behind goals we didn't conceive. Biointegration is every bit as noble a goal as conservation ever could be. We do not need to be ashamed.

The next 100 years can be equivalent in many ways to the beginning of the agricultural age. If we persevere, many additional animals and plants can become part of our everyday life, to the benefit of humanity as a whole. It is vitally important we get the organisms that are most suitable for this integration now. Those that miss out on this round will miss out forever. We have two choices — to keep on the current path of fostering biodiversity, or to change in favor of biointegration. Only biointegration is sustainable and compatible with the general improvement of the human condition. What could be nobler than promoting that?

Literature Cited

de Vosjoli, P. 1996. The Further Reaches of Herpetoculture. *The Vivarium* 8(1):21.

Leopold, A. 1949. *A Sand County Almanac, with Sketches Here and There*. Oxford Univ. Press, NY. xiii. 226 pp.

Lovelock, J. 1988. *The Ages of Gaia, a Biography of Our Living Earth*. Oxford Univ. Press, NY xx. 252 pp.

Stevenson, R. L. 1874. On the enjoyment of unpleasant places, pp. 3-13 In: W. L. Phelps (ed.). 1912. *Essays of Robert Louis Stevenson*. Charles Scribners' Sons, NY xxii. 184 pp.

Wilson, E. O. 1984. *Biophilia*. Harvard Univ. Press, Cambridge. 157 pp. 

Check out

The Vivarium

Online @

www.vivarium.com

It's a World of Herps



Monitors & Tegus

Controversies about rodent diets for Savannah monitors.

by Michael Balsai

While researching the revision for my book about the care of monitor lizards (Balsai, 1997), I found references which suggested that a steady diet of rodents for savannah monitors (*Varanus exanthematicus*) (and white-throated monitors, *V. albigularis*) may cause health problems. For example, it was reported by Lemm (1994, see also Bayless, 1992) that he had seen more and more savannah monitors dying from "hair impactions" as a result of a high rodent diet. Lemm also stated that many monitor keepers believe that feeding mice and rats to these varanids resulted in obese lizards which eventually died from kidney failure (presumably as a result of visceral gout). Because of such accounts, more than one reviewer suggested that I not recommend rodents as a diet mainstay for either monitor species. Instead, a diet of invertebrates may be preferred.

Obesity can be a common problem with savannah monitors if their food intake is not strictly regulated. Photo by Chris Estep



*In recent years, white-throated monitors (*Varanus albigularis*) have become regularly available in the pet trade. Their general care is similar to the savannah monitor's. Photo by Chris Estep.*

I have never observed problems of impaction, obesity, or visceral gout from feeding rodents to savannah monitors. Obesity in these lizards results usually from overfeeding and a lack of exercise. One herpetoculturist reported that he has seen fur impactions only in very obese monitors (Bayless, personal communica-

tion). Perhaps obesity affects the monitor's ability to digest rodents.

Obesity shouldn't become a problem if food intake is regulated strictly. Perhaps problems arising from rodent-based diets are the result of overzealous feeding, not diet. However, novice varanid keepers may find it more difficult to maintain proper nutrition (especially calcium balance) when feeding a largely invertebrate diet.

Finally, I'm perplexed why savannah or white-throated monitors would develop kidney failure from a rodent-based diet. These lizards are carnivores so they should not develop hyperuricemia as a result of feeding diets high in animal protein, as is the case with iguanas and terrestrial chelonians (Frye, 1991a, b). Indeed, a study by Maixner et. al. (1987) showed that savannah monitors which were fed mice cleared elevated post-feeding serum uric acid levels within about 48 hours. These results were consistent and reproducible.

Thus I suggest that rodent-based diets are not necessarily a danger to savannah and white-throated monitors. Ad-

ditionally, feeding rodents rather than invertebrates by novices should more easily ensure an adequate diet, particularly regarding calcium intake.

Literature Cited

Balsai, M. J. 1997. *General Care and Maintenance of Popular Monitors and Tegus*, Advanced Vivarium Systems, Santee, CA.

Bayless, M. K. 1992. African varanids: Diets in captivity and in the wild. *VaraNews* 2(5):2-3.

Frye, F. L. 1991a. *Biomedical and Surgical Aspects of Captive Reptile Husbandry*, V. 1. Krieger, Malabar, FL. pp. 41-94.

Frye, F. L. 1991b. *A Practical Guide for Feeding Captive Reptiles*. Krieger, Malabar, FL. 171 pp.

Lemm, J. 1994. Captive husbandry of white-throated monitors (*Varanus albigularis*) at the San Diego Zoo's Center for Reproduction of endangered species (C.R.E.S.). *VaraNews* 4(2/3): 4-5.

Maixner, J. M., E. C. Ramsay, and L. H. Arp. 1987. Effects of feeding on serum uric acid levels in captive reptiles. *Journal of Zoo Animal Medicine*. 18: 62-65.



CREATIVE Aquatic & Pets

**Your Mail Order & InterNet Source For
All Of Your Reptile Needs.**

800-227-0001

Call for a FREE Price List TODAY!! Can't Wait? We're as close as
your computer screen. Find us at: <http://www.pohina.com>

- T-Rex® Reptile Diets
- ESU® Litter
- ESU® Lighting Products
- Pearlco® Heat Emmitters
- Vita-Lites®
- Critter Tubs
- Fluorescent Light Fixtures
- Tera-Top® Tank Tops
- Reptile Misters & Sprayers
- Drip Waterers
- Calcium & Vitamin Supplements
- Electronic Digital Thermometers
- NutriGrow® Diets
- And Much, Much More!!!!



Dealer Inquiries Welcome

Where can I find a
great selection of reptile
supplies?



Custom Cages

14 Dry Run Road
River Falls, WI 54022
1-800-766-6354
1-715-425-8888



High Quality Reptile Housing

Herp Products

ATTENTION ALL HERP PRODUCT ADVERTISERS AND MANUFACTURERS!

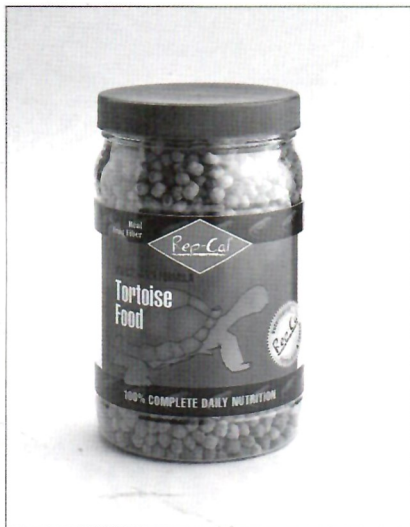
Now is the time to submit photos and press releases for new products. If selected, they will be featured in our end of the year Cutting Edge Issue.

STRAWBERRIES WILD

Rep-Cal has combined the expertise of nutritional science with the best practical feeding experience to produce a high quality tortoise diet. **Rep-Cal's Tortoise Food** has been tested for nutritional quality on tortoises by means of complete physical examinations, growth measurements, and blood analysis by expert reptile veterinarians and nutritionists. Rep-Cal is continuing with long term feeding trials, as well as research in reptile nutrition, to ensure that their products always provide the best possible nutrition for growth, reproduction and health.

Rep-Cal Tortoise Food contains a natural blend of fine ingredients from around the world: red papayas from Brazil, mangoes from India, and strawberries from California's world renowned berry patches.

Rep-Cal Research Labs
408-356-4289
<http://www.repcal.com>

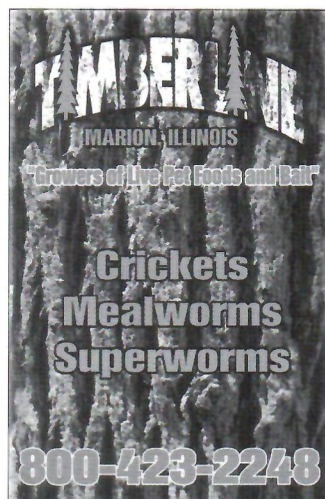


LIVE FOODS ONLINE

Timberline, live pet food growers, has announced they have joined the cyber market. With the introduction of their new web page, information about Timberline products is now available 24 hours a day. Email links are also available for all staff members. As an added convenience, all products can be obtained by ONLINE ORDERING, or by calling 800-423-2248. Timberline grows Crickets, Mealworms, Giant Mealworms, Superworms, Wax Worms, Night Crawlers, and other live pet foods and also sells related accessories.

Check them out at <http://www.timberlinefisheries.com>

email at:
livefood@timberlinefisheries.com



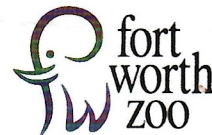
Send Materials to:
The Vivarium
P.O. Box 300067
Escondido, CA 92030-0067

IGUANAS OF THE WEST INDIES POSTER

The Fort Worth Zoo announces the publication of a beautiful new poster highlighting the conservation of **Iguanas of the West Indies**. Featuring rare and exceptional color photographs of 14 of the 18 Cyclura and Iguana. This high quality poster measures 20 x 26 in. and is printed on a heavy-duty paper stock suitable for framing. Produced to assist the IUCN/S.C. West Indian Iguana Specialist Group in promoting the preservation of these endangered lizards. All proceeds from the sale of this poster will help to fund critical iguana research and conservation projects throughout the Caribbean. Posters can be obtained in the U.S. for \$13.00 including postage and mailing tube; international orders are \$16.00. Checks or money orders (in U.S. currency) should be payable to the **Fort Worth Zoo**. Mail requests to:



Rick Hudson
Fort Worth Zoo
1989 Colonial Parkway
Fort Worth, TX 76110

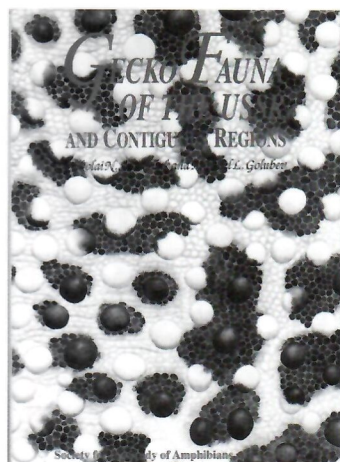


ENERGY SAVERS UNLIMITED, INC.

New from ESU Reptile the **Cool Pet Misting Wand** is an ideal way to keep reptiles, birds, dogs and other animals cool. Made of durable high density PVC plastic with a brass and stainless steel nozzle, the Misting Wand creates a superfine mist that can lower temperatures by up to 30° F. Attached securely to standard garden hose, the Misting Wand uses only half a gallon of water per hour while preventing animal overheating.

For additional information contact **Energy Savers Unlimited**, 910 E. Sandhill Ave., Carson, CA 90746.





Gecko Fauna of the USSR and Contiguous Regions

Nikolai N. Szczerbak and Michael L. Golubev

233 pages, 24 color photographs, numerous b/w photos and figures

ISBN 0-916984-39-7

\$48.00

Available from: Booksellers such as The Bean Farm, (206)-861-7964

This remarkable work translated from Russian covers a vast area that includes Mongolia, Pakistan and Afghanistan. The introductory information on taxonomy will enlighten anyone with an interest in geckos and provides information on the meticulous work performed by herpetologists. This book also reveals the many species of geckos present in these regions. It includes invaluable information on the taxonomy, systematics and natural history of several popular species such as leopard geckos (*Eublepharis macularius*) and frog-eyed geckos (*Teratoscincus* spp), as well as poorly known eublepharids and a large number of other geckos generally unknown to the hobbyist community. Highly recommended to anyone with a serious interest in geckos.

Amphibians and Reptiles of the Paraguayan Chaco

David R. Norman

Photographs by Lawrence Naylor

281 pages, 64 color photographs, 17 figures

ISBN 997-12-109-5

\$20.00 in the U.S.

Available from: David Norman, Interlink 155, Post Office 526770, Miami, Florida.

This is a bilingual book with both Spanish and English text that covers the amphibian and reptile species inhabiting the Paraguayan portion of the expansive South American alluvial plain known as the "Gran Chaco." Herpetoculturists will find it a useful illustrated reference. The book covers a number of herps of great interest to hobbyists, such as the Chacoan horned frog (*Ceratophrys cranwelli*), the Chacoan monkey frog (*Phyllomedusa sauvagii*), the red-spotted burrowing frog (*Leptodactylus laticeps*—probably the most beautiful member of the genus) as well as many reptiles such as the hognose snakes of the genus *Lystrophis*, tegus and others. The author also provides an extensive bibliography on the Chacoan herpetofauna.

ANFIBIOS Y REPTILES DEL CHACO PARAGUAYO TOMO I

AMPHIBIANS AND REPTILES OF THE PARAGUAYAN CHACO VOLUME I



DAVID R. NORMAN
Fotografías / photographs
LAWRENCE NAYLOR

Lizards Volumes 1 and 2

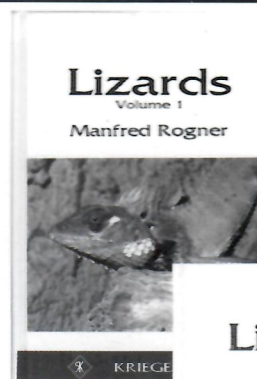
Manfred Rogner

Volume 1: 328 pages, \$59.50 hard cover; ISBN 0-89464-9396

Volume 2: 318 pages, \$54.50 hard cover; ISBN 0-89464-968X

ISBN set: 0-89464-9728

Available from: Krieger Publishing Co., PO Box 9542, Melbourne, FL 32902-9542. 407-724-9542.



This two-volume set is a translation of the German two-volume *Echsen*. Krieger Publishing has played a key role in making available the works of German herpetoculturists for those who read only English. Krieger's previous effort in this area was *Geckoes* by world renowned gecko herpetoculturist Wilhelm Henkel. These appealing books make us aware of the wealth of herpetocultural knowledge of Europeans and bring to our attention many species that are uncommon in U.S. collections. The information-packed volumes are illustrated with numerous high quality color photographs and cover most lizards kept by herpetoculturists plus other species as well. The volumes contain essential herpetocultural references and are highly recommended.

Tortues continentales de Guyane française

Continental Turtles of the French Guiana



Sebastien Metrailler
Georges Le Gratiet

Continental Turtles of the French Guiana

Sebastien Metrailler and George Le Gratiet

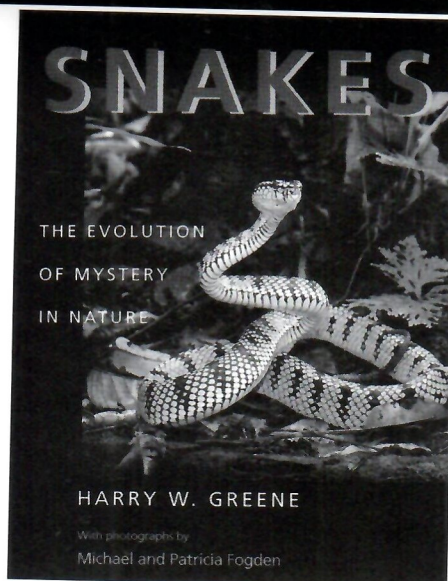
128 pages, 44 color photographs, numerous b/w photos, maps and figures.

ISBN 2-9700124-0-5

\$45.00

Distributed by: P.M.S., CP 82, 1967 Bramois, Switzerland.

This nifty, highly illustrated book is written in French with summaries in English. A wealth of information is provided on description, systematics, distribution, sexual dimorphism, ecology, growth, reproduction and rearing of these turtles in captivity. Many popular species are included such as red-footed tortoises, yellow-footed tortoises, mata-matas, various side-necks turtles and the South American wood turtle, *Rhinoclemmys punctularia*. This book is a must for anyone with an interest in turtles from this neotropical region. For the herpetoculturist, the many useful tidbits on habitat, climate, husbandry and reproduction will prove invaluable.



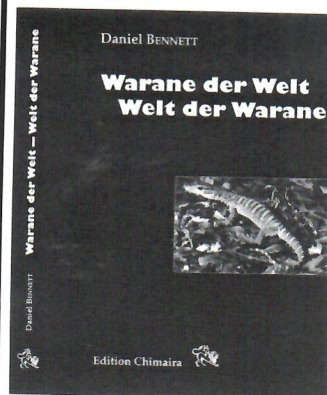
Snakes: The Evolution of Mystery In Nature

Harry W. Greene
The University of California Press
352 pages, 215 color photographs
ISBN 0-520-20014-4
\$45.00 cloth.

Available from: Bookstores or
order at 1-800-882-6657.

We were fortunate to be given a set of color page proofs of this beautiful and informative book prior to its June release. Let us simply say that it is one of the best books on snakes to have come out in years. It covers a wide range of topics including life-styles, diversity and a section with a synthesis on evolution, biogeography, ethnoherpetology and the future of snakes. Harry Green, a herpetologist and professor of biology at U.C. Berkeley has written a book rich with substantial information and insights. This is one of the finest overviews of snakes written to date and is accompanied by the outstanding photographs of world renown wildlife photographers Michael and Patricia Fogden. A must for snake aficionados and anyone wanting to acquire a general knowledge on this group of reptiles. This fine book represents a big step in elucidating the mystery implied in its title. It is bound to be one of the more exciting herpetological releases of 1997.

SUBSCRIBE TO
THE VIVARIUM
CALL: 800-982-9410
OPEN 24 HOURS



WARANE DER WELT WELT DER WARANE

The most complete and comprehensive book on monitor lizards (including the largest bibliography) ever published. Written by an author who shows both his enormous knowledge concerning the subject and his love and respect for these creatures.

Warane der Welt—Welt der Warane is a revised version of Daniel Bennett's book, *The Little Book of Monitor Lizards* with an expanded bibliography. Hardcover, with dustjacket, 384 pp., 193 color photos, Several b/w illustrations, maps, & photographs. \$79.80 (DM 128.-)
Available from:

Edition Chimaira
Friedberger Anlage 14
60316 Frankfurt, Germany
Fax: +49-69-497826
e-mail: Frogbook@aol.com

Bibliomania!
195 West 200 North
Logan, Utah 84321-3905 USA
Phone/fax: 801-752-0297
e-mail: Herpbooks@sisna.com

Wholesale orders welcome



NEW
RELEASE

IF YOU HAVE AN IGUANA, if you ever thought about owning one, or even if you simply like the idea of reading about these exotic, prehistoric-looking lizards, **Green Iguana—The Ultimate Owner's Manual** is for you. This book, the culmination of 5 years of research, reads like a novel—fun, interesting, exciting—but with the accuracy and impact of a scientific journal.

GREEN IGUANA

The Ultimate Owner's Manual

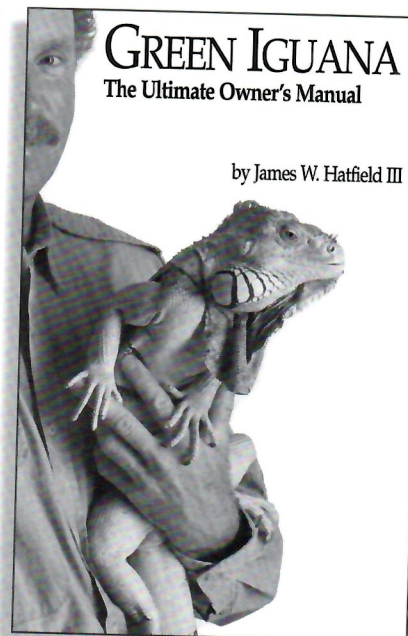
tells you how to raise a healthy and happy iguana, including

- Choosing the right iguana
- Food your iguana needs—and those to avoid
- Necessary habitat requirements
- Avoiding the most common pitfalls in raising an iguana
- What to do if your pet gets sick or injured
- Why the commitment of owning an iguana may *not* be right for you
- **SPECIAL** section on taming and training—the first of its kind in an iguana pet care book
- and much, much more

This 6"x9" book has more than 600 pages of text, 10 appendixes, a comprehensive index, 16 pages of color photographs, 16 black-and-white photos, and 35 illustrations and charts. Weighing in at nearly 2½ pounds, the book covers just about everything from birth to death of an iguana.

The author has gathered information from the world's top iguana scientists and research institutions, hundreds of iguana owners throughout North America and Europe, veterinarians, people in the pet trade—and from his own field research in the jungles of Mexico and Central America. Plus the real-life experience of raising his own iguana, Za (pictured on the front and back covers).

Green Iguana—The Ultimate Owner's Manual is available at the retail price of \$32.50 + \$4.00 S&H for U.S. and \$5.00 for Canada; international orders, call for shipping price. (Note: the limited publisher's introductory price has expired.) Make your check or money order payable to **Dunthorpe Press** and mail it to us at: P.O. Box 80385, Dept H, Portland, OR 97280 U.S.A. Remember this book — it's the **ULTIMATE!**

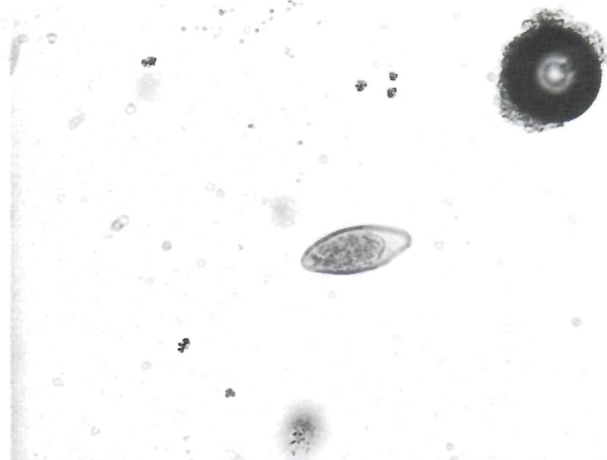


As a special bonus, all books ordered directly from Dunthorpe Press are autographed by the author, so let us know when ordering the book how you want your autograph to read.

(503) 635-8222

FAX (503) 635-8405

<http://www.tierraverde.com>



Pinworm ova (x100). Red-tailed rat snake.

Pinworms: Friend or Foe?

by Roger Klingenberg, DVM
All photos by the author.

Oxyurids, more commonly known as pinworms, are small nematode parasites encountered frequently in reptiles. Over the years this author has been a staunch advocate of eliminating any and all parasites found in reptiles. About five years ago Dr. Kevin Wright wrote an excellent article based on the controversy surrounding the use of anthelmintics (dewormers) in captive herbivorous reptiles (Wright, 1992). I strongly suggest reviewing Dr. Wright's article. Since that time, the debate has continued, with most assumptions made based on mammals as a model for comparison. Let's look at some actual reptilian examples and then make up our minds.

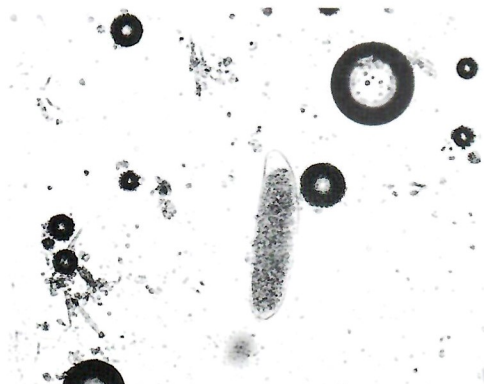
Why would we not want to treat these parasites? It has been proposed that certain nematode parasites, particularly pinworms, are essential for normal gastrointestinal (GI) function in herbivorous reptiles. The dense populations of nema-

Pinworm ova (x100). Green Iguana.

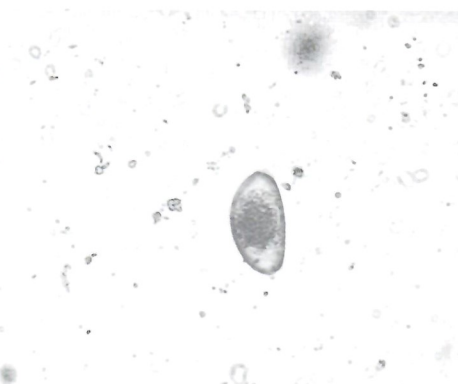
todes in the large intestine and cecum of wild green iguanas (*Iguana iguana*) have been thought to be essential for churning ingesta. The movement and rotation of this material increases the surface area of digested materials for the protozoal and bacterial flora of the gut, thereby increasing the foods' digestibility. It has also been suggested that pinworms may prevent constipation in reptiles by breaking up fecal matter. Other proposed pinworm benefits include digestion of cellulose, production of vitamins and micronutrients, and stimulation of peristalsis (normal intestinal motility). Maybe pinworms aren't so bad? Was I too hasty in my elimination of ten of thousands of the little vermin? A resounding NO! I currently feel more strongly than ever that pinworms should be eliminated whenever possible.

The only good things I can say about pinworms are that they are very host specific and have distinctive ova that are easily recognized on fecal examination. Due to the fact that pinworms have a high host specificity, they are not spread easily to other reptiles. In other words, an iguana's pinworms are different from a boa's which are different from those in a tortoise. The ova are relatively large and are easily found during routine fecal examinations (see Figures 1-5).

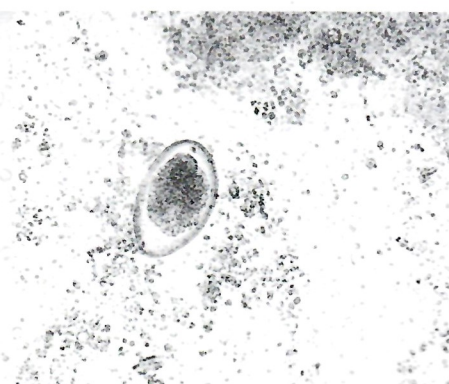
Perhaps the worst thing about pinworms is that they have a direct life cycle, which means they can reproduce and re-infect the original host without involving any other intermediate hosts. This leads to a condition known as *super-infection* in which the captive host is overwhelmed by parasite numbers. It is my opinion that all



Pinworm ova (x100). Sawu python.



Pinworm ova (x100). Blue-tongue skink.



Pinworm ova (x100). Greek tortoise.

parasites with direct life cycles diagnosed in captive reptiles should be eliminated. The term *captive reptile* is important in this sweeping statement, as super-infections would seldom occur in free-ranging reptiles.

Okay, enough theoretical discussion. Let's see some evidence of pinworms causing harm. It is my contention that rectal prolapses are much more common in green iguanas, box turtles, tortoises, and even snakes when pinworms are present. In mammals, pinworms are capable of causing tremendous colonic and rectal inflammation leading to itching, rubbing, and straining. This appears to happen in some reptiles too. Rectal prolapses can have dire consequences if the affected tissue dries and or becomes secondarily infected. Discomfort is one thing, the loss of extensive rectal tissue is another. Prolapses should be treated as medical emergencies. Holding a moistened washcloth gently over the prolapse will protect it from the rear feet of the reptile and help to prevent dehydration on the way to see your reptile vet.

At the risk of going out on a limb (which has never stopped me before), I would suggest also that pinworms are a cause of pica (ingesting inanimate objects) in green iguanas. In my ex-

perience, iguanas presented for GI foreign bodies have uniformly been infected by pinworms too. Certainly one could argue that pinworms aren't the only cause of pica, which is poorly understood in captive reptiles. It could be further argued that because most green iguanas have pinworms, it only makes sense that those presenting for foreign bodies would have them as well. These are valid arguments, but a parasite capable of causing GI discomfort and irritation can certainly cause pica.

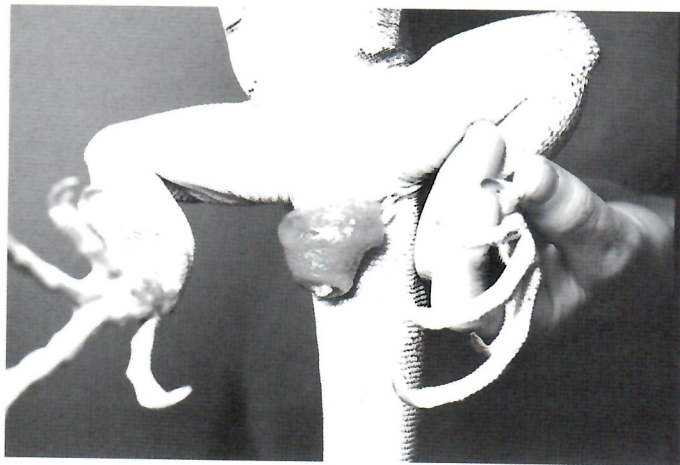
Each reptile owner will have to make their own decision regarding the treatment for pinworms in their pet. In all medical decisions, risk versus benefits are an important consideration. As there have been no proven advantages to harboring pinworms and treatment can be accomplished with extremely safe anthelmintics, it seems the prudent thing to do.

Literature Cited

Wright, K. 1992. The use of anthelmintics (dewormers) in captive herbivorous reptiles. *The Vivarium*, Vol. 3, No. 6. pp. 23 and 25. 



Rectal prolapse in a green iguana. Biopsies of prolapsed tissue revealed mild inflammation secondary to heavy pinworm loads.



This green iguana with a rectal prolapse attempted to rub the irritated tissue with its foot and would continue to self-mutilate if not restrained.



This green iguana died from a ruptured intestinal tract secondary to its having consumed a multitude of small rocks from its habitat. Could this pica have been stimulated by the large pinworm population present?



Rectal prolapse in a boa constrictor. A thorough examination revealed no inciting causes other than large pinworm populations. The owner had observed the snake chronically rubbing the underside of its tail and straining, despite having had normal bowel movements.

COMMITMENT TO EXCELLENCE **THROUGH RESEARCH & DEVELOPMENT**

*from Kingsnakes to
Cobras*

*from Iguanas to
Monitors*

*from Red-Eared Sliders
to Sulcata Tortoises*

*T-Rex has the family of nutritional products
made especially for your reptile.*

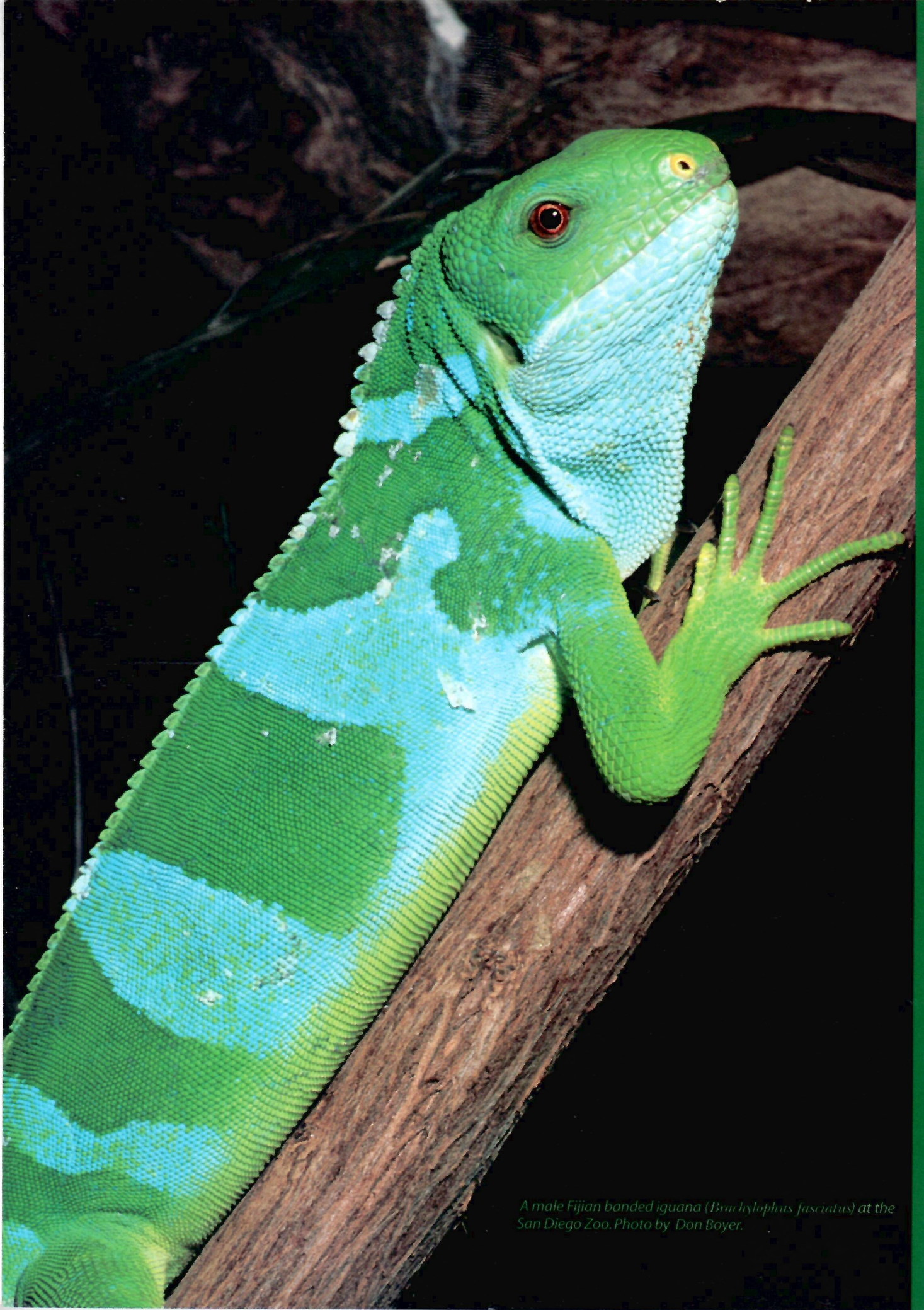


T-REX advanced reptile research products are available to the general public through pet retailers worldwide. Some of the nutritional products now available are the same Snake Steak Sausages used to save the world's most endangered snake (the Antigua Racer) on breeding project at the Jersey Wildlife Preservation Trust, in England. Also try our Solar Drops, Iguana Dry Formula, and our new Folifore Dry Formula, the same combination used to bred the rarest iguanas in the world, (Iguana, Iguana Delicatisima). There's our world famous Tortoise Dry Formula, used by zoos and breeders from San Diego to Moscow. We sponsor many captive breeding projects including the largest breeder of Leopard Geckos in the world, all being fed T-REX Gecko Grub. And coming soon, Cricket Maker and Mouse Maker, nature identical odor manipulants helpful in encouraging feeding responses and broadening the range of foods eaten by most captive kept reptiles.

Advanced Research Reptile Products™ from T-REX

T-REX Products Inc.:
1124 Bay Blvd. Chula Vista, CA 91911
Ph#(619)424-1050 Fax#(619)424-1051 (800)911 T-REX

European Distribution Centre: Underworld Products
Units 1 & 2 Belton Road West Loughborough, Leicestershire England LE11 0TR
Tel:(1509)610310 Fax(1509)610304



A male Fijian banded iguana (*Brachylophus fasciatus*) at the San Diego Zoo. Photo by Don Boyer.

CAPTIVE BREEDING OF THE



Green Banded Iguana

AT THE SAN DIEGO ZOO

BY JOHN KINKAID



Previous page:
Photo of
B. fasciatus
hatching. Photo
by John Kinkaid.

Left: Female
Brachylophus
fasciatus at the
San Diego Zoo.
Photo by Don
Boyer.

Below: A Fijian
iguana breeding
cage. Photo by
Don Boyer.



One of the most spectacular lizard species in the world today, the Fijian banded iguana, *Brachylophus fasciatus*, is seen rarely in the wild or in zoos. First described by Brongniart in 1800, these iguanas lived in relative obscurity until Gibbons and Watkins' landmark study (1982). Little was known about the captive management of these animals, and breedings were scarce outside of Fiji. Due to recent advances in herpetoculture, a self-sustaining population is now being managed at the San Diego Zoo.

One of only a few species of iguanids found outside the New World, Fijian iguanas are suspected to have rafted across the Pacific from South America (Cogger, 1974). Declining steadily for the past century, their population is now less than 10,000 individuals in 29 sub-populations (Captive Breeding Specialist Group, 1994). The main causes for the iguana's decline are predation by introduced mongooses and feral cats, and, to a lesser extent, habitat destruction for farming. Scattered throughout small islands from Fiji to Tonga, all of the populations should be considered at risk, due to their insular status and the ability of their predators to colonize. As endangered species, all Fijian iguanas are protected fully under international law and hold 'illegal to export' status from the Fijian government.

Banded iguanas inhabit mostly coastal and lowland forests, but are found in all types of undisturbed habitats up to and including cloud forests on Vanua Levu. The lizards are equipped with sharp claws and long tails and perhaps climb down from trees only to nest and move from one tree to another.

Adult iguanas weigh about eight ounces (227 g) and measure about six to eight inches (15-20 cm) snout-vent length (SVL) and up to 24 inches (61 cm) total length (TL). Sexually dimorphic, males have a green background with two pale blue or white vertical bands on the body and spots on the neck, while females are generally solid green with occasional spotting and partial bands. Some pattern variation between islands has been suggested, but not well described.

The San Diego Zoo has displayed banded iguanas since 1965, starting with a gift of six animals from HRH Prince Tungi of Tonga. The first captive birth came in 1981, which started a series of incubation trials that led to today's successes.

Our banded iguanas are housed in 3 ft wide x 3 ft long x 6 ft high (91 cm w x 91 cm l x 183 cm h) galvanized steel enclosures. These enclosures are open on all



sides and the roof to allow heat to escape and UV light to enter. The large size of these habitats is necessary because the males are highly territorial and can be aggressive toward their cagemate females in smaller enclosures. The cages are furnished with large horizontal branches for perching and sleeping. Lodgepole landscape timbers are an appropriate diameter and easy to clean. Non-toxic plants such as pothos (*Scindapsus* spp), nephthytis (*Syngonium podophyllum*), *Ficus benjamina* and *Aglaonema* spp provide a sense of security, hide spots for females, and a source of browse. Sphagnum moss on cage bottoms raises humidity and aids shedding. Cages are misted three times weekly with tepid water so that iguanas may drink from leaves and branches. Although iguanas receive most of their hydration in this way, a clean bowl of water is provided at all times. Due to the amount of water used, ample enclosure drainage and air circulation is necessary to prevent bacterial skin infections. Throughout the year, the iguanas are kept at 82-88° F (28-31°C) and provided a photoperiod of 12:12 hr of light:dark.

Natural sunlight is most critical in the care of banded iguanas. No combination

of commercial lighting is an adequate source of ultraviolet light for the long-term maintenance of Fijian banded iguanas. Thus all of the enclosures are moved — either by cage rollers or, for smaller cages housing juveniles, carried by hand — to an enclosed patio where the animals bask in natural sunlight. Display animals that don't have access to natural sunlight are rotated off exhibit every few months, and are given artificial lighting, which consists of Westinghouse™ FS20 sunlamps over a 0.635 cm thick UV-T filter (Rohm and Haas Co., Philadelphia, PA). The UV filter blocks deleterious wavelengths. However, the lights are no substitute for natural sunlight. Adequate basking time for juveniles appears to be three or four hours a day, several times a week. Adults require slightly less basking time. Perches, plantings and visual barriers provide shaded areas for behavioral thermoregulation.

Fijian banded iguanas are omnivorous and fed a large variety of foods. A mixed salad of fruits and vegetables supplemented with fresh browse and flowers is offered three times weekly. Waxworms, crickets, kingworms, and silkworms are some of the insects that are offered on

days when salads aren't fed. All food items are dusted with a mixture of vitamins and calcium carbonate and are offered ad libitum. Males have a tendency towards obesity in captivity, so they are fed less of the high-fat items, such as waxworms, and put on weight-reducing diets, if needed.

Banded iguanas are highly territorial (Carpenter and Murphy, 1978), so males are never housed together, and visual barriers, such as shade cloth, are used on the enclosures to keep males from viewing one another. However, closely monitored, brief viewings are allowed between males to stimulate breeding. Female iguanas can also be territorial, so they are housed alone or with a single male. Separations, whether due to medical or behavioral problems, are kept to a minimum, as even previously amicable pairs can become aggressive toward one another during reintroduction. Some biting may occur during reintroductions and courtship, but if the pair is watched, serious injuries are usually avoided. Animals are paired at early ages (four to six months if a suitable mate is available) and spend all of their time together. Some pairs never become compatible, however, and are split up, even though genetically they may

Male *Brachylophus fasciatus* in display color. Photo by Don Boyer.

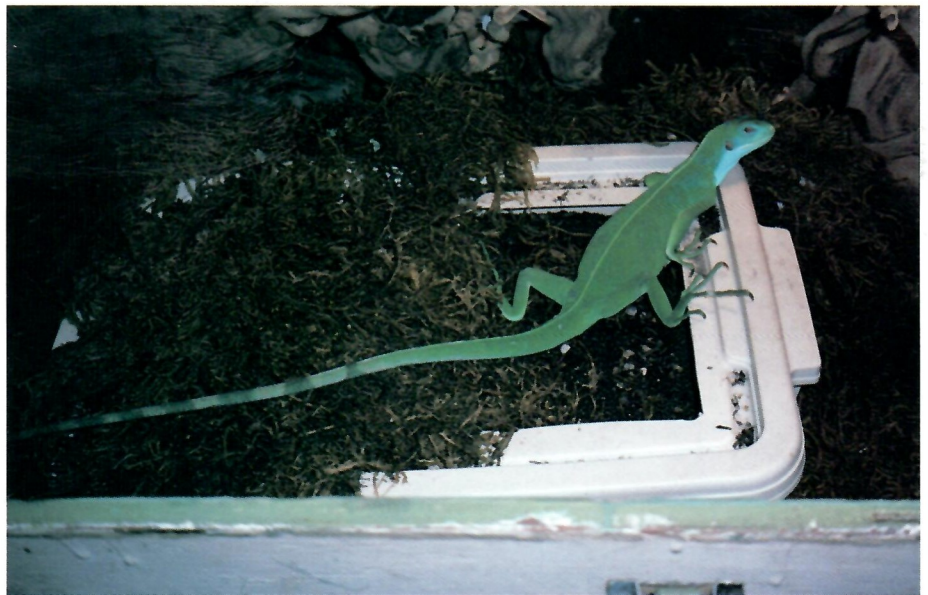


seem to be an ideal pairing.

Courtship is similar to behavior observed in green iguanas (*Iguana iguana*), with head bobbing and licking of the neck and forelimbs. Copulation lasts about 15 minutes and is repeated three or four times in a day. Courtship and breeding may last for a week and occur numerous times. Oviposition occurs usually about two months after the last breeding. Animals reach sexual maturity at about two years of age, but fertility of the first clutches is often low.

For nest boxes, covered plastic containers (such as Tupperware™) measuring 18 inches long x 18 inches wide x 9 inches high (45 cm l x 45 cm w x 23 cm h) and filled to the top with moistened, packed planting mix are placed in a quiet corner of the enclosure. A hole about 4 inch x 4 inch (10 cm x 10 cm) is cut in the lid of the box to give the female access and a sense of security. Nests are dug downward, diagonally away from the entrance, to the bottom of the box where three to seven oblong eggs are laid. The female then fills the nest, tamps down the soil with her head, and may defend the nest for a short period after oviposition.

The eggs are removed for artificial incubation. Fijian banded iguana eggs weigh about one-half ounce (from nine to 12 grams) at oviposition, are 1 inch x 1.5 inches (2.5 cm x 4 cm), and will double in size before hatching. The eggs are incubated at 82° F (28°C) in a covered Tupperware™ container half filled with a 1:1 (by weight) mixture of vermiculite and water. Incubation temperatures of 82° F have resulted in the best hatchabil-



Female Fijian banded iguana in nest box. Photo by A. Lieberman.

ity and an almost 1:1 ratio of males to females. The box and vermiculite mixture are changed every two weeks, at which time the eggs are reweighed and checked for signs of fertility and fungus. Incubation length has ranged from 121 to over 200 days. In San Diego, most clutches are laid between April and July, but clutches have come in every month of the year. Single clutches are the norm, but occasionally females double or even triple clutch in one year. To help females recover from the stress of laying, the iguanas are fed some of their favored foods and given calcium gluconate or nursing pink mice as supplements.

Hatchling iguanas are first housed sin-

gly in 20-gallon (76 l) screened terraria set up in the same manner as the adult enclosures. Mostly insectivorous for the first month, hatchlings are monitored closely and assisted in feeding, if necessary. Juveniles grow rapidly, and within six months iguanas can be paired and placed into adult enclosures.

The current U.S. population of Fijian banded iguanas stands at 40 males and 24 females, maintained in 9 institutions: San Diego, Chaffee, Denver, Audubon Park, St. Louis, Cincinnati, Toledo, Houston, and San Antonio Zoos. All of the animals remain the property of the Fijian government with the responsibility for management placed at the San Diego Zoo. Over

Brachylophus fasciatus eggs. Photo by D. Boyer.



Cage setup for neonate Brachylophus fasciatus. Photo by D. Boyer.

70 hatchlings have been produced in San Diego and third generation captive breedings have been accomplished in San Diego, San Antonio and Dallas. A Species Survival Program has been planned but not yet implemented for this species, and a regional studbook has been compiled but not yet published. Though the desire by private individuals to keep these animals is strong, the iguanas are a national treasure of Fiji and, because they are an endangered species, there is little chance of these animals legally being held outside of zoos. With the large population of young animals on loan to other zoos, the captive population should continue to grow well into the future and give everyone the opportunity to view this fascinating lizard.

About the author: John Kinkaid has worked at the San Diego Zoo for nine years and is lead keeper in reptiles. He is in charge of the Fijian banded iguana breeding program and studbook.

Literature Cited

Captive Breeding Specialist Group. 1993. *Brachylophus* taxon report from CBSG lizard CAMP workshop.

Carpenter, C. C. and Murphy, J. B. 1978. Aggressive behavior in the Fiji Island lizard *Brachylophus fasciatus* (Reptilia, Lacertilia, Iguanidae). *J. Herpetol.* 12:215-252.

Cogger, H.G. 1974. Voyage of the banded iguana. *Australian Nat. Hist.* 18(4):144-149.

Gibbons, J. R. H. and Watkins I. F. 1982. Behavior, ecology, and conservation of South Pacific banded iguanas, *Brachylophus*, including a newly discovered species. In: Burghart, G.M. and Rand, A. S. (eds.), *Iguanas of the World*. pp. 418-441.



Designed to meet the specific needs of most Herps and Amphibians, our Lizard Lounge® may be configured to satisfy virtually any temperature, humidity or lighting requirement.

- * 11 sizes from 32 gallon up to 110 gallon!
- * Secure "cam locks" prevent unauthorized animal adventures and escapes!
- * Exclusive ventilation design utilizes natural heat convections for superior air exchange.

Now available from an independent retail pet store near you. For more info, call us at (214) 320 - 6050.

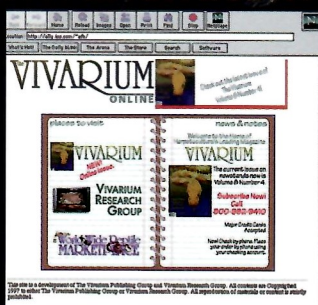
OCEANIC
SYSTEMS, INC.

Model 32 Lizard Lounge® in Light Granite Finish on Light Granite Cabinet Stand*



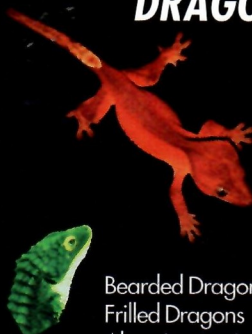
* Lighting and stand sold separately.

www.vivarium.com



Home of The Vivarium Online

DRAGON'S DEN HERPETOCULTURE



Bearded Dragons
Frisled Dragons
Abronia graminea



The finest in
captive produced lizards



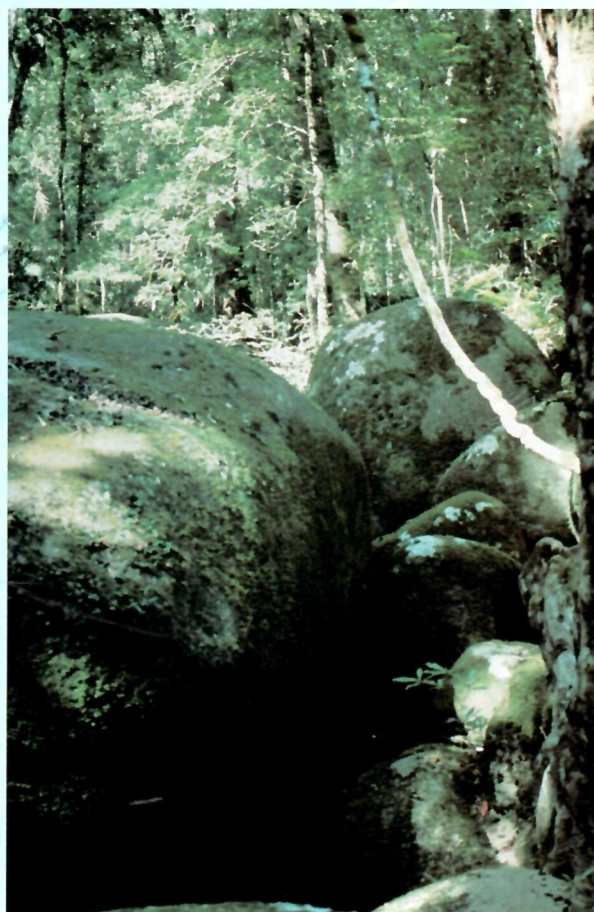
Rhacodactylus
Goniurosaurus
Nephurus

For prices: SASE or Email dden@gte.net
PO Box 1116 Santa Barbara, Ca. 93116 805.692.9946 <http://www.spydercide.com/lizards/lizards.htm>

The



Leaf-tailed Beckos of Australia



Saltuarius and *Phyllurus*, Natural History and Taxonomy

Part One: *Saltuarius*

by **Robert Porter**

Far Left: Rainforest *S. swaini*, Mt. Tamborine, south-east Queensland. (Photo Robert Porter) Above: Boulder stream habitat of *S. occultus*, McIlraith Ranges, far north Queensland. (Photo M. Anthony).

Introduction: Australia is well blessed with representatives of the lizard family Gekkonidae. At the time of writing, the total number of described species stands at around a hundred and this will undoubtedly increase as new species and taxonomic revisions continue. Two sub-families occur in Australia, the Gekkoninae and the Diplodactylinae. The latter is further divided into tribes, of which both the Diplodactylini and the Carphodactylini are present.

The Carphodactylini are characterized by the presence of a patch of pre-anal pores (Kluge, 1967). However, in three members of the tribe, including the Australian genera *Phyllurus* and *Nephruroides*, these appear to have been secondarily

digits are long and strongly clawed as an adaptation for an arboreal or saxicolous life style.

Cogger (1992) recognised four species of Australian leaf-tailed gecko, all in the genus *Phyllurus*, namely *P. caudiannulatus*, *P. cornutus*, *P. platurus* and *P. salebrosus*. Couper et al. (1993) reviewed the genus, dividing it into two distinct genera and describing four new species, three in *Phyllurus* and one in the new genus *Saltuarius*. The two genera are distinguished on the basis of internal and external characters, as well as karyotypic differences (see Table).

Saltuarius

The genus *Saltuarius* currently contains

groups. One is confined to the Granite Belt region of southern Queensland and northern New South Wales, the other is found in the forests of coastal south-eastern Queensland and adjacent New South Wales as far south as Newcastle. Apart from some color differences, they appear to be morphologically indistinguishable (P. Couper, personal communication). Electrophoretic analysis, however, indicates the two populations are very distinct, possibly more so than other members of the genus and it is likely that they will be split at a later date (C. Schneider, pers. comm.).

The Granite Belt population occurs in spectacular country characterized by huge rock outcrops and lichen encrusted boulders beneath dry, open *Eucalyptus* forest. Geckos can occasionally be found during the day sheltering beneath granite exfoliations, although the majority of specimens probably shelter deep among the cracks and crevices of the outcrops during daylight. Activity begins shortly after dusk, when the animals move slowly up onto the vertical rock faces where they remain, motionless, for long periods awaiting potential prey.

The granite rock insulates against the freezing winter temperatures experienced by this high altitude region, which may drop as low as 18° F (-8°C). In warmer months, the rock retains the sun's warmth well into the night, allowing the geckos to maintain body temperatures higher than the ambient air temperature by absorbing sufficient heat through direct contact with the rock surface. These lizards are thus able to remain active in ambient air temperatures as low as 51° F (10.5°C) (personal observation).

These observations are considerably lower than the minimum ambient temperatures at which the more southern *P. platurus* has been found active (Greer 1989).

The granite must also provide another advantage to these lizards in the form of a stable humid microclimate, despite the dry appearance of the region generally. Evidence for this humidity requirement can be seen when the animals are kept in captivity. Specimens rapidly develop skin shedding problems unless their enclosures are misted daily. This same humidity requirement is also essential for the

modified (Bauer, 1990). Also included in this tribe are the New Zealand geckos, *Naultinus* and *Hoplodactylus*, and the New Caledonian genus *Rhacodactylus*.

The Australian leaf-tailed geckos are an endemic group restricted to humid coastal areas of eastern Australia. They are characterized by a dorsally depressed body, elaborate decorations of spines and tubercles and, in most species, some form of leaf-like tail, which only has one cleavage point at its base. Regrown tails are almost invariably plainly marked and lack the spiny nature of the original. The

four species, distributed from northern New South Wales to northern Queensland. They include Australia's largest gecko and all are adorned with spines and tubercles.

Saltuarius swaini - Originally this species was combined with the leaf-tailed geckos from northern Queensland under the name *Phyllurus cornutus*. Couper et al. (1993) recognised the south-eastern Queensland and northern New South Wales population as a distinct species in their new genus, giving it the name *S. swaini*. The species contains two separate



Granite Belt *S. swaini* from Giraween National Park, southern Queensland. (Photo R. Porter).



Habitat of Granite Belt *S. swaini*, Giraween National Park, southern Queensland. (Photo R. Porter).

eggs of this species which dehydrate within only a few hours if environmental moisture levels are not suitable (pers. obs.). This reliance may dictate the distribution of the species, which is not found in any other rock habitats outside of the Granite Belt, whereas other saxicolous species of gecko, for example *Oedura tryoni*, are quite widely distributed in numerous rocky habitats in the vicinity.

During a visit to the Granite Belt in October 1993, a total of nine specimens were located between 1930-2320 hours. Of these, eight were males and all but two, including the single female, possessed regenerated tails. A second visit in March 1994 produced three males and one female, of which two males had regenerated tails. It is likely that the males establish and maintain individual territories, possibly explaining their predominance on the rock faces. Of the 13 specimens observed, none of the males were found within 33 feet (10 m) of each other, however, one adult pair was located 12 inches (30 cm) apart on the same vertical rock face during the October visit. In captivity, males are very aggressive toward each other, while males and females live together amicably.

The territorial nature of the species may also explain the high incidence of regenerated tails. Loss of tails may occur by increased exposure to predation pressure and by intraspecific aggression, which has been found to initiate tail loss in captive animals (pers. obs.). More research is required to assess the importance of these two factors on leaf-tailed gecko populations.

Analysis of a small number of fecal samples from Granite Belt geckos produced a range of insect groups, including moths, cockroaches and beetle parts, plus a small number of items from other arthropods such as centipedes.

Vocalization in this species has been observed only during agonistic interactions with other specimens or while being handled. A brief raspy squeak is produced commonly, lasting about one second, but it may be extended over several seconds, often fluctuating in intensity relative to the apparent degree of threat. This behavior is accompanied often by intimidation behavior such as arching of the body and tail toward the threat, opening the mouth and waving the tail from side to side.

The forest-inhabiting populations of *S. swaini* occur in mature rainforest or wet sclerophyll forest. Here the most commonly utilized home ranges are the complex, buttress root systems of large fig trees (*Ficus* sp.), and in particular the Strangler Fig (*F. watkinsiana*). The seeds of this

A specimen of rainforest S. swaini in situ on a buttress exhibiting superb camouflage and typical head down orientation. (Photo R. Porter).

tree germinate on the bark of other established trees high up in the forest canopy. A series of roots are sent down to the ground, where they thicken and eventually envelop the host tree, which then dies. The end result is a cylinder of intertwined roots providing a secure, humid retreat.

When encountered at night, most forest *S. swaini* are positioned on tree trunks in a vertical position with the head pointing towards the ground, a behavior also noted in other species (see *S. salebrosus* below). Relying upon excellent camouflage, these geckos are reluctant to move unless disturbed. Two types of escape behavior have been observed — an extremely slow crawl to a suitable retreat and a more abrupt drop to the ground and run for the nearest available cover. Specimens are rarely found more than six to ten feet (2–3 m) above the ground, although there is one record at 30 feet (9 m) (Darlington, P. J. in Loveridge, 1934).

Little is known of the reproductive habits of the species. Ehmann (1992) reports that the eggs of forest *S. swaini* are laid in excavations in the soil which are then covered with soil and litter by the female. The same author also relates an instance





Saltuarius occultus, McIlraith Ranges, far north Queensland. Note the extremely elongate neck. (Photo M. Anthony).

of communal nesting in northern New South Wales, where two groups of ten and 14 eggs, respectively, were located under flat wood. However, it was unsure if this was the result of several females laying communally, or one female repeatedly using the same oviposition site.

Saltuarius cornutus - Following taxonomic revision of the Australian leaf-tailed geckos (Couper et. al., 1993), *S. cornutus* is now believed to occur only in far north-eastern Queensland. It is commonly found at night on exposed vertical faces of tree trunks, particularly large buttress trunks, although it has also been found on rock outcrops.

This species is distinguished by the tubercles of the lower flanks which are hooked with associated basal spines and by the presence of pre-anal pores, as opposed to the straight, solitary spines of *S. swaini*, which also lacks pre-anal pores. This is Australia's longest recorded gecko species, reaching a maximum snout-vent (S-V) length of 5.75 inches (146 mm) and a weight of about 1.8 oz (50 gm) (Couper and Gregson, 1994).

Little is known of the natural history of *S. cornutus* and references to this species in past literature may actually refer to *S. swaini*. The only non-captive record of reproduction relates the finding of two eggs beneath the fallen bark of a dead tree among the buttress roots of another tree (Anthony, 1993). Deposited in a mixture of decaying vegetation and sand below the level of the leaf litter, the eggs mea-

sured 1.1 inches (28 mm) x 0.7 inches (18 mm) and were positioned 1.2 inches (30 mm) apart. Successful artificial incubation of these eggs produced hatchlings measuring 1.9 inches (47 mm) S-V length and a total length of 3.0 inches (75 mm). Couper et. al. (1993) recorded an incubation time of 100 days for this species at 75° F (24°C). The hatchlings measured 2.0 inches (50.6 mm) and 2.1 inches (51.4 mm) S-V length.

Saltuarius salebrosus - Challenging *S. cornutus* as Australia's longest gecko, *S. salebrosus*, or the rough-throated leaf-tailed gecko, has a maximum S-V length of 5.6 inches (143 mm) (Bauer, 1990). It is an impressive animal in both size and body form, possessing ample spines and tubercles on its body and distinctive broad, fleshy tail. It is easily distinguished from other leaf-tailed gecko species by the presence of tubercles on the throat. Cogger (1992) reported that the elongated tip of the original tail is distinctly longer than that of *S. cornutus*, although examination of numerous specimens and photographs of both species by the author has not supported this fact.

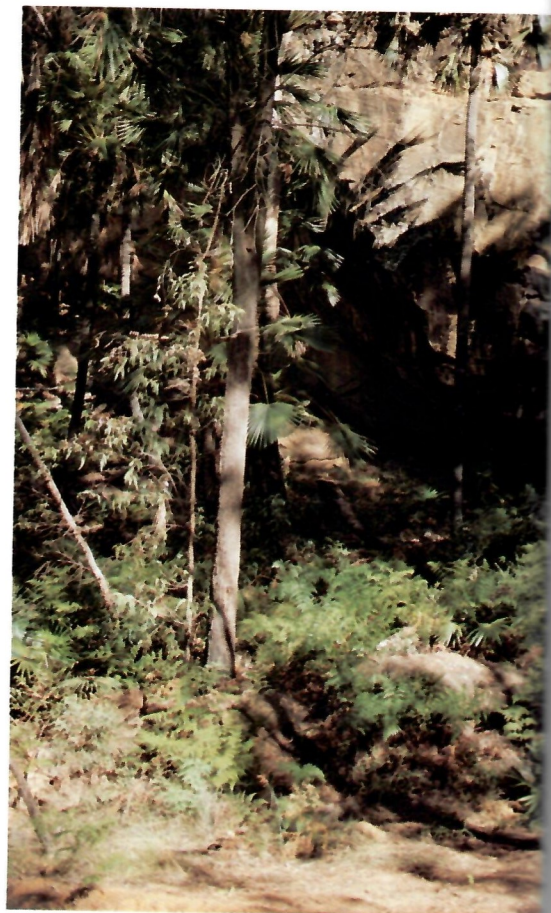
This gecko's distribution range covers a small area of central Queensland, where it is an inhabitant of rocky habitats, particularly sandstone outcrops.

Fig tree (Ficus sp.) buttress, a typical microhabitat for rainforest S. swaini. (Photo R. Porter).

It is also known to occur in a limited number of rainforest sites, one of which is also home to the smaller leaf-tailed gecko species *Phyllurus caudiannulatus*.

The author has observed this species at Blackdown Tableland west of Rockhampton, Queensland on two occasions (March 1993 and March 1995) and has found it to be very abundant on the sandstone cliffs and boulders at night, with over 40 animals located during some 20 hours search time. Specimens were also located foraging on the trunks of the Blackdown Stringybark (*Eucalyptus sphaerocarpa*), but these were always within ten to 13 feet (3-4 m) of rock cover. The majority of geckos located on both rocks and trees were found within 6.5 feet (2 m) of the ground.

All specimens located were oriented vertically with the head pointing down. The adaptive significance of this behavior is uncertain, but perhaps it indicates that a major portion of the diet comprises ground-dwelling invertebrates which may migrate up the rock faces and vegetation at night. The only reports of gut contents of this species relates to preserved museum specimens, one of which contained a large cockroach and a pygmy grasshop-



per, while a second animal held fragments of a spider (Couper et. al., 1993).

Approximately two-thirds of the rough-throated leaf-tailed geckos at Blackdown Tableland had regenerated tails, although it is uncertain if this is an indication of predation pressures (from nocturnal birds such as owls and frogmouths) or from intra-specific aggression, as noted by Wilson and Knowles (1988). The regenerated tails appear to be thicker and fleshier than the originals and may be of greater use for storage of fat, which is utilized during periods of hardship or cold weather inactivity.

Little published material is available concerning the rough-throated leaf-tailed gecko. Couper et. al. (1993) reported measuring a juvenile in mid-May at 2.1 inches (52.8 mm) S-V length and suggested that the specimen was probably a recent hatchling from that year, for example in February.

Saltuarius occultus - The most recently described species in the genus, *S. occultus* is also the most restricted in range and the least known. It was described following the collection of four specimens in the McIlraith Ranges of Cape York Peninsula, northern Queensland in 1979 (Couper et. al., 1993). This distinctive gecko was distinguished from other leaf-tailed gecko species by its elongated, slender neck and flat, angular head. They further differed from the nearby *S. cornutus* by possessing straight flank tubercles without surrounding spines, and from *S. swaini* by having pre-anal pores.

Its habitat is upland vine forest. Lethbridge et. al. (1994) found specimens occurring on granite boulders in a creek bed. These rocks were covered with mosses and lichens on the upper side, while the geckos were located on the bare lower side. Many specimens of ring-tailed gecko (*Cyrtodactylus lousiadensis*) were also located here. They appear to be exceptionally large in this area, reportedly exceeding 11.8 inches (300 mm) in total length (M. Anthony, pers. comm.).

Part II: *Phyllurus*, will follow in *The Vivarium*, Volume 8, Number 6.

Acknowledgements - I would like to express my thanks to the following people, all of whom provided generous assistance of varying forms, enabling me to produce this manuscript: Kieran Aland, Michael

Figure 1. Distribution of the leaf-tailed gecko genus *Saltuarius* in Australia.

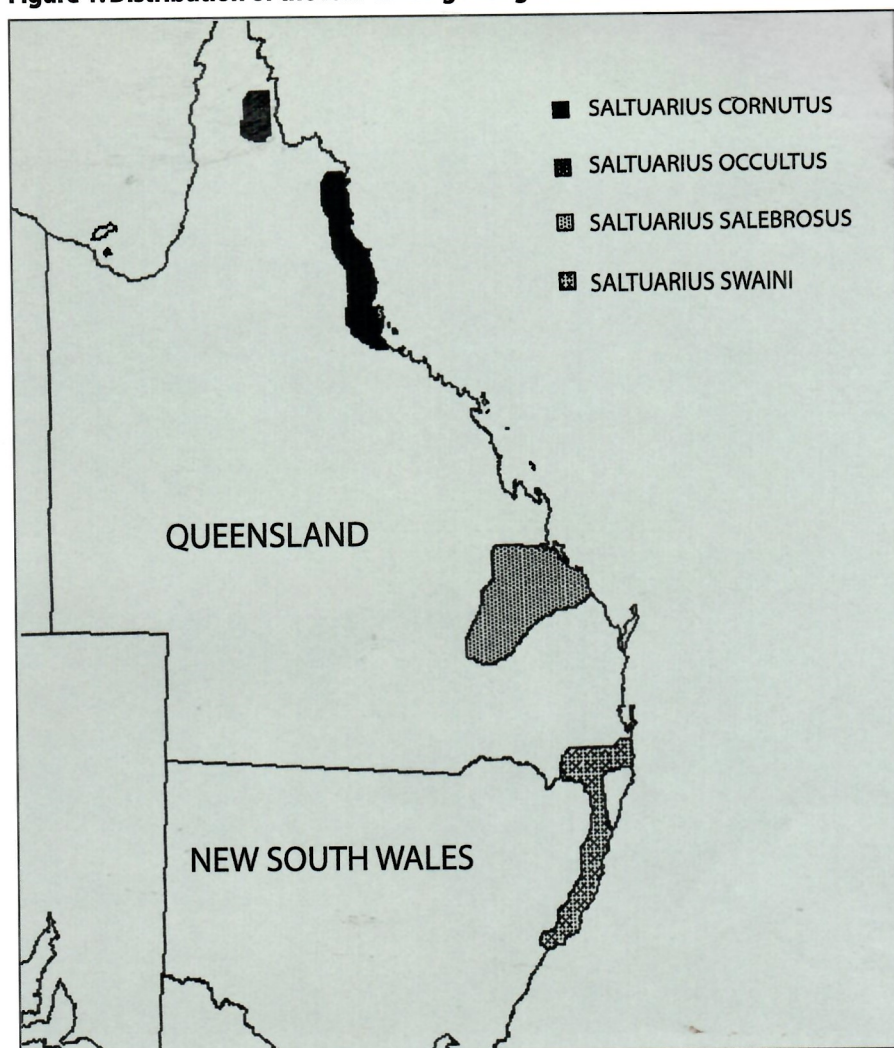


Table: Characteristics of *Saltuarius* and *Phyllurus*.

CHARACTER	SALTUARIUS	PHYLLURUS
SIZE	Large	Small
NOSTRIL	In contact with rostral scale.	Not in contact with rostral scale.
AXILLA	Not or shallowly invaginated.	Always, sometimes deeply invaginated.
PRE-ANAL PORES	Present (except <i>S. swaini</i>).	Absent.
ORIGINAL TAIL	Strongly flared with elaborate outer fringe.	Simply flared or cylindrical, no elaborate outer fringe.
REGENERATED TAIL	Strongly flared with short tip.	Simply flared or cylindrical, with long tip.
ROSTRAL SCALE	Completely divided.	Partially divided (except <i>P. caudiannulatus</i>).

Continued on page 69

Keeping and Breeding the Amazing Chacoan Monkey Frog



*A Photo Essay by Philippe de Vosjoli, Robert Mailloux
and David Travis*

All photos by David Travis unless otherwise indicated

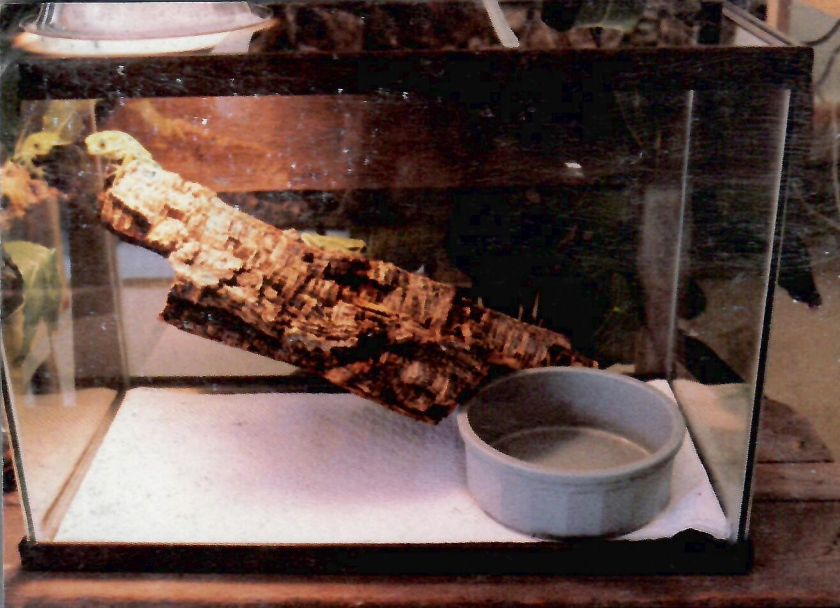


Left: Adult Chacoan monkey frog. The Chacoan monkey frog is the most arid-adapted of the phyllomedusine treefrogs and has many interesting characteristics not found in most other frogs. As for other phyllomedusine treefrogs but unlike other frogs, *P. sauvagii* has distinctive vertical pupils. Like some phyllomedusines, the fingers of this treefrog are not webbed but free. The toes are free, too, except for small webbing at the base. The toe pads are very reduced. Unlike most frogs this species tends to walk rather than jump, using opposable first fingers and toes (thumbs) for gripping branches. Phyllomedusines with this ability are generally referred to as monkey frogs. The most amazing features of *P. sauvagii*, however, are its adaptations for conserving water. Evaporative losses are reduced by waxy esters produced by lipid secreting glands and distributed over the skin. At least two other phyllomedusines perform this behavior, *P. hydrochondrialis* and *P. iheringii*. *Phyllomedusa sauvagii* however is the only frog known to drink, tilting its head upward during rainfall and taking in water by mouth through pumping motions of its throat. The Chacoan monkey frog also thermoregulates by a process analogous to sweating, allowing water droplets to form on its skin if the temperature gets above 104° F (40°C). To further reduce water loss, *P. sauvagii*, unlike most amphibians, is uricotelic, excreting uric acid in semi-solid form and reabsorbing water through the walls of its bladder. As a result of this adaptation, evaporative water loss in *P. sauvagii* is only 10% of other anurans, comparable to that of desert lizards. The skin of *P. sauvagii* also secretes a variety of polypeptides with pharmacological effects. This amazing species continues to be a fascinating subject of scientific research.

Right: An area of the dry Chaco, with characteristic scrubby vegetation, photographed near Filadelfia, Paraguay. The Chacoan monkey frog has a wide distribution in the area of South America known as the Gran Chaco, a vast alluvial plain formed by sedimentary deposits from the Andes. The Gran Chaco has been divided into two life zones — a Warm Temperate Dry Forest and a Warm Temperate Moist Forest (Holdridge, 1969). *Phyllomedusa sauvagii* is found primarily in the dry Chaco with a distribution ranging from southeast Bolivia, northwest Argentina and a wide portion of Paraguay. In the past, most specimens of *P. sauvagii* were imported from Argentina until that country closed animal exports. Recently, specimens were imported from Paraguay and these are the source of captive-bred froglets currently offered in the herpetocultural market. Photo by Vaughan Shoemaker.



Left: The Chacoan monkey frog can be difficult to sex outside of the breeding season. Females grow larger than males, reaching a length of 3.25 inches (8.2 cm); males reach a maximum length of 2.8 inches (7.1 cm). During breeding season, one may identify males by their dark brown nuptial pads on the outer surfaces of the thumbs and by their calling and other breeding behaviors.



Left: Chacoan monkey frogs can be kept in simply designed enclosures. A basic setup for adults may consist of a 20 gallon (76 l) vivarium with screen top, newsprint substrate, branches and cork bark sections for perching and an incandescent light fixture with a 75 watt bulb. The temperature at basking sites should reach 90–95° F (32–35° C). A full-spectrum reptile bulb should be provided for four hours daily, although requirement for UV light needs to be determined. A shallow water dish with clean aged water should be available at all times. These frogs will readily feed on commercial crickets offered two to three times a week (three or four per frog, per feeding). The crickets should be fed a nutritious diet and coated lightly once a week with a powdered vitamin/mineral mix consisting of one part powdered calcium carbonate and two parts reptile vitamin/mineral supplement. For a naturalistic display, snakeplants, Chinese evergreen and spineless bromeliads such as *Neoregelia* spp may be introduced in pots, out of direct exposure to the spotlight. Pea gravel or sandy soil can be used as substrate in naturalistic vivaria. Lights should be on timers and the photoperiod adjusted to a temperate cycle, e.g. 14 hours of light during the summer and ten hours of light during the winter. Photo by Bob Mailloux

Right: To breed this species, a large rain chamber measuring 72" long x 42" wide x 72" high (183 cm x 107 cm x 183 cm) was constructed. Water was pumped up from the bottom plastic pool through PVC pipe which had been drilled with many small holes to create a sprinkler effect. The pump was turned on manually between 6 pm and midnight daily, for periods ranging from 0.5 to eight hours. As few as four pairs and as many as twenty pairs of frogs that appeared healthy and had good weight were introduced at one time into the chamber, for stays of up to two weeks. After one or more days of simulated rain, several pairs would be in amplexus and would often remain in amplexus for several days. Eventually, successful breeding occurred. Whether prolonged amplexus is a necessary prerequisite to breeding was not determined but appears probable. In one case we observed breeding on a night when the water pump remained off. After their removal from the rain chamber, frogs were returned to vivaria and fed well for three or more weeks. Depending on their health and weight as well as weather conditions, such as drops in barometric pressure and the advent of rainy weather, the frogs were reintroduced to the chamber.



Egg-laying tended to occur at night after the rain period, when the pump was turned off. Intermittent rain cycles may be important for breeding this species. As suggested by the breeding schedule, the breeding season for *P. sauvagii* is extended but breeding probability appears to decrease as one nears what would correspond to the Paraguayan winter. To precondition specimens for repeated breeding, we plan to keep them in air conditioned rooms for two to three months at 60–75° F (15–24° C) during summer or fall. Photo by Bob Mailloux

Left: Tadpoles are best raised in large containers such as children's wading pools. Photo by Bob Mailloux.



Left: On the morning following a successful breeding, leaves were found folded in a funnel around an egg mass containing from 200 to 700 eggs. After six to eight days several hundred tadpoles hatched from each egg mass which was kept at temperatures ranging between upper seventies (F) (mid-twenties, C) at night to lower eighties (F) (upper twenties, C) during the day. When ready to hatch, tadpoles wriggled out of the egg and dropped from the funnel into a water container placed beneath the egg mass.

Right: Developing eggs.



Right: Metamorphosing tadpoles. If kept between 76° F (24° C) and 86° F (30° C), the tadpoles start to metamorphose into froglets between four and six weeks following hatching. At that time it is critical to have areas that allow froglets to emerge from the water. We use water hyacinth and aquatic primrose to keep the water clean and provide emergence areas. In some pools we had high mortality in metamorphosing froglets as well as deformities and missing limbs and eyes. These symptoms only became apparent at the time of metamorphosis. We suspect a fungal or bacterial infection was the probable cause.



Left: Tadpoles of the Chacoan monkey frog are raised easily on tropical fish flake food. We started small tadpoles on Sera® Micron powder and Tetramin®. Larger tadpoles were fed primarily Tetramin® Staple Flakes and Tetra Spirulina Flakes. Tadpoles should be offered as much as they will eat at a feeding, two to three times a day. Sprinkle small amounts on the water surface until all food is consumed, then repeat until the tadpoles stop feeding. Excess food accumulates on the bottom, leading to spoilage and poor water quality, increasing the risk of disease. To prevent tadpole die-offs, excess food should be carefully siphoned from the aquarium or pool.



Above: Larger froglets. Unless exposed to disease, the froglets of this species are hardy and grow rapidly. Color changes include shifts from bright green to blue to, at night, a dark lavender. We suspect that sexual maturity may be reached by one year of age. The future of this great frog in herpetoculture will depend on diligent efforts by herpetoculturists to solve the problems of multigenerational breeding and long term husbandry. The word is that the future availability of imports is questionable

Right: Froglets should be kept like adults except that smaller diameter perching branches should be provided. They should be fed commercially-raised crickets with a length equivalent to the length of the frog's head (a good general guideline for selecting the right prey size for frogs). Initially froglets were fed two week old crickets, two to three times a week and supplemented lightly with a powdered vitamin/mineral twice a week. We lost a number of froglets which had been housed with imported *P. hypochondrialis* that developed symptoms of red leg disease (*Aeromonas* infection).



Acknowledgments: The authors wish to thank Dr. R. Ruibal and Dr. V. Shoemaker of U.C. Riverside for sharing with us their research experiences and for their help in providing us with information and copies of their various papers and articles.

Source Materials

Cei, J. M. 1980. Amphibians of Argentina. *Monitore Zoologico Italiano*, N.S. Monogr. 2.

Holdridge, L. R. 1969. Estudio ecologico de los bosques de la region oriental del Paraguay. Proyecto de desarrollo forestal y de industrias forestales. Asuncion: Food and Agricultural Organization of the United States.

Norman, D. R. with Naylor, L. (photographer). 1994. *Amphibians and Reptiles of the Paraguayan Chaco*.

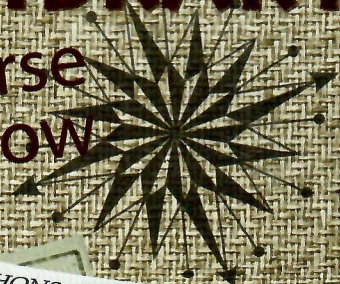
Ready, M. and Fenolio, D. 1994. Phyllomedusine Frogs of Latin America. *The Vivarium*. Vol. 5 No.6, pp 26-29, 36-37.



Breeding Date	Number of Eggs
1/14/97	600-700
1/28/97	about 370
1/28/97	about 645
1/29/97	500+
2/12/97	no count attempted
3/1/97	no count attempted
4/11/97	no count attempted
5/21/97	200

HERPETOCULTURAL LIBRARY SERIES®

We set the course
that others follow



"No writer has been more influential than Philippe de Vosjoli, author of the **Herpetocultural Library Series**, a collection of inexpensive booklets on the care and breeding of popular groups or species... They should go out with every new animal you sell to a herp hobbyist."

-Dr. Robert J. Goldstein
Pet Age Magazine

BEST SELLERS BY

Philippe de Vosjoli
David & Tracy Barker
Michael Balsai
Roger Klingenberg
& Other Reptile Experts

**ADVANCED
VIVARIUM
SYSTEMS, INC.**

10728 PROSPECT AVE. SUITE G
SANTEE, CA 92071-4558 USA
(619) 258-2629 : FAX (619) 258-7262

Mice in the Attic, Snakes in the Basement:

A Visit with Steve Hammack

by Randall L. Gray

It had been a long night and a short sleep. Matt Moyle and I stayed up until 3 AM talking about reptiles and reptile people, but now I must pay for those long discussions because we have a full day ahead of us.

Matt is in town for a conference and came by to view my lizard collection and share herper stories. Unlike me, Matt keeps snakes. So, I promised him a tour of Steve Hammack's collection in Ft. Worth, Texas as well as a trip to a premier reptile collection at the Ft. Worth Zoo.

I had known of Steve Hammack for years but only met him when I moved to Texas in 1992. Steve is best known as the proprietor of his business — the Herpetological Institute for Scientific Study (HISS... get it?). He has been marketing captive-born snakes through a widely distributed price list for the last ten years.

Steve is 37 years old and was born and raised in Ft. Worth. However, he does not have that Texan drawl that I have become acclimated to since moving to the Lone Star state. Although Steve may not sound like a Texan, he sure does sound like a herpetoculturist. Whenever I call and ask how it's going he says "It's crazy!" and then quickly relates the daily activities associated with a large snake collection. While we are on the phone I always hear the repeated clicks of call-waiting that indicate other herpers wait to talk with Steve.

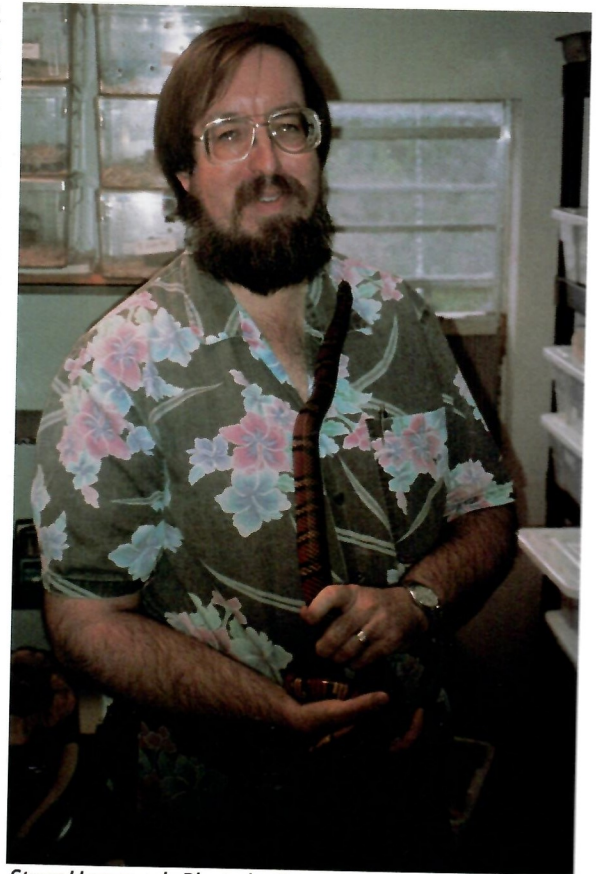
Steve's productive collection — 650 hatchlings — helps pay the bills so his wife Susan can stay home and care for their four year old son, Kevin. In addition to being a full-time private snake breeder, Steve is a herpetarium supervisor at the Ft. Worth Zoo. Between his private collection and the Zoo's, he puts in most of his waking hours dealing with herps.

As if being a full-time animal caretaker wasn't enough, Steve is also involved in research at Texas Christian University. Under the guidance of Dr. Gary Ferguson, Steve is carrying out a long-term study on the effects of moisture on snake egg incubation and is assisting with nutritional studies on panther chameleons, *Chamaeleo pardalis*. Over the last 16 years Steve has assisted Dr. Ferguson on five other research projects.

Steve has written several scientific papers and popular articles on reptiles. He is also a good public speaker, which I observed on a local television station when he gave an informative presentation on chameleons. Steve is often an invited speaker to regional herpetological society meetings. Regrettably, his busy schedule and family needs dictate that he decline most invitations.

Steve is active in herpetological societies. He was the founder of the North Texas Herpetological Society in 1982 and president for five terms. Also, he served on the board of the Society for the Study of Amphibians and Reptiles and was their regional herpetological society liaison.

Although his time is limited and tasks are many, Steve is always tackling new projects. He is a member of the American Zoo and Aquarium Association's Lizard Advisory Group and is in charge of coordinating the Taxon Management Accounts. This series is a guide to keeping lizards in captivity that will help zoos and private herpetoculturists better care



Steve Hammack. Photo by Randall Gray.

for their animals.

Before taking a position with the Ft. Worth Zoo five years ago, Steve worked at the Dallas Zoo as a reptile keeper for almost five years. In addition, Steve has been a live-animal biologist for the Ft. Worth Museum of Science and History, importer of reptiles and small mammals, and pet store employee. During this time he pursued a degree in biology at Texas Christian University, but has not yet graduated.

The collection - When Matt and I arrive at Steve's two story home near TCU, I

repeat to myself a catchy little jingle that starts out "Zippercorn Steve, Zippercorn Steve, he breeds motley mutants and sells them to..." It was composed by Dave Blody, curator of reptiles and amphibians at the Ft. Worth Zoo, and refers to Steve's inordinate fondness for albinos and other abnormal color variations.

Steve answers the door in a colorful flower print shirt which contradicts his somewhat reserved personality. After visiting for an hour in his dining room, which is lined with hundreds of herpetology books, he takes us to his son's room to show off a newly acquired leucistic leopard gecko (*Eublepharis macularius*). Steve explains that the leopard geckos and bearded dragons (*Pogona vitticeps*) residing in the bedroom are for his son's breeding project. Sure! I used that same excuse twelve years earlier when half of my son's room was filled with lizard cages because there was no where else to put them.

After admiring the lizards, which he began acquiring due to my positive influence, we move into a converted porch on the second story that is full of plastic shoe and sweater boxes housing colubrid snakes. Many of the snakes are albino, melanistic, striped, or some other unusual color variation. There is even an albino red-eared slider turtle (*Trachemys scripta elegans*) in a ten-gallon (38 l) tank.

One end of the porch is separate and used as a cool-room to maintain montane forms such as a variety of *Lampropeltis* spp: black milk snakes, Ruthven's milk snakes, Durango Mountain kingsnakes, and Andean milk snakes. The most notable species is the Andean milk snake, *Lampropeltis triangulum andesiana*. This large and attractive species was first bred in 1987 at the Dallas Zoo through the efforts of Steve. He was also the first private breeder to produce this species. Breeding success was ensured when he discovered that year-round cooler temperatures were what this species needed.

Before returning downstairs, I encourage Steve to show Matt his rodent colony. Steve reaches up to the ceiling and pulls down a ladder. We ascend into the attic where a productive rodent colony is tucked away. Steve breeds rats, mice and even deer mice. Susan is responsible for maintaining this group of animals and it is obvious that she is doing the job well.

We move on to the basement where Steve's boa and python collection is kept.



An anerythristic Kenyan sand boa (*Eryx colubrinus loveridgei*), one of many color mutants bred by Steve Hammack. Photo by Rick Reed.

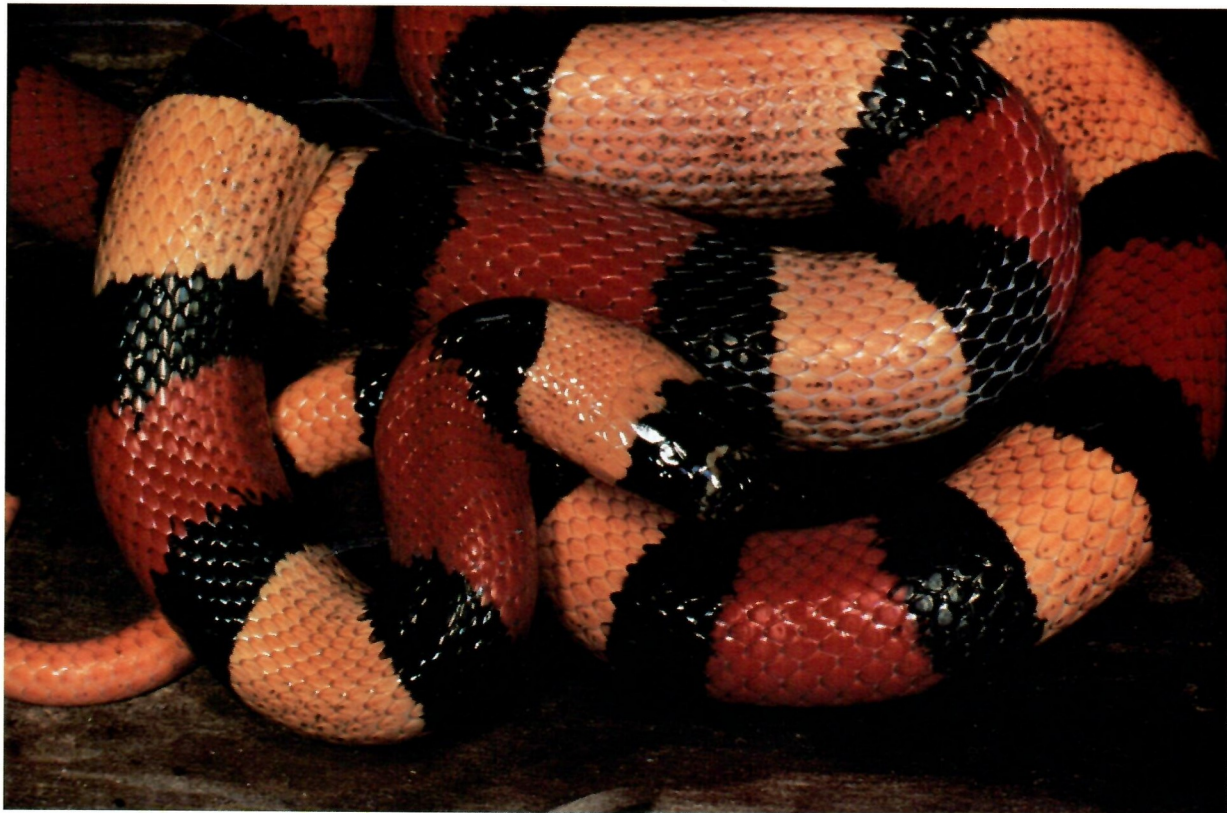
The myriad of larger, wood and glass cages hold blood pythons (*Python curtus*), Burmese pythons of various color phases, sand boas (*Eryx* spp.), jungle carpets (*Morelia* spp.), Brazilian rainbow boas (*Epicrates cenchria*) and Dumeril's boas (*Boa dumerilii*). As we wander between the cages, many of the snakes are alerted to our presence and become active, perhaps

hoping that our trip to the attic will bring them their dinner.

I ask Steve what the future will bring for him. He is excited about the science of herpetology and feels there will be major strides in our knowledge about herpetofauna. However he is not as positive about the business side of herpetoc-



"Tangerine" Andean milksnake, *Lampropeltis triangulum andesiana*. This new color phase was originally selectively-bred by Stephen Hammack. Photo by Rick Reed.



Apricot Pueblan milksnake, *Lampropeltis triangulum campbelli*. Another color phase of milksnakes started by Stephen Hammack. Photo by Rick Reed.



Steve's attic serves as a productive rodent farm. Photo by Steve Hammack.

ulture. Steve indicates that the reptile market is dynamic and he is unsure what he will be doing in a few years. The large number of reptile expos has changed the market for private breeders selling their animals through price lists. He and others are concerned about declining prices and sales. He points to the rapid increase in reptile enthusiasts in the last few years, which appeared promising. However, most are beginners and interested only in common, inexpensive species. Whether these novices will eventually mature into serious collectors wanting more expensive species, is unknown.

At the zoo - After saying good-bye to Steve, Matt and I head for the Ft. Worth Zoo, where Steve has arranged a behind-the-scenes tour of the reptile collection. Rick Reed and Ken Morgan graciously show us the Zoo's excellent collection.



Albino Mexican hognose snake, *Heterodon nasicus kennerlyi*. Photo by Rick Reed.

am always eager to implement. I also think of Steve and other herpetoculturists I have written about, whose passion for herpetology allows them to accomplish so much in so few hours. This reminds me of a quote (whoever said it is long gone from my memory): "Nothing great was ever achieved without enthusiasm." Steve does not lack enthusiasm. 



A photo of Steve's boa and python room.



Natural History and Captive Husbandry of the Mexican Milk Snake, *Lampropeltis triangulum annulata*



Close-up of a Mexican milk snake. Notice the bullet-shaped head and lack of a well-defined neck. Both are adaptations to a burrowing life-style.

by **Thurgess Cranston**

Photos by author unless otherwise indicated.

STOP, stop, stop, stop, stop! BACK, back, back, back....HERE!!" my friend exclaimed with a machine gun repetitiveness from across the road. In fact, that was the most animated my frequent herping buddy had been for the last four days. I knew by his excitement that he had seen something of immense interest. I ran across the deserted highway as fast as my tired legs could carry me.

"There!" my friend exclaimed. In the light I saw an intensely fluorescent, 34 inch (86 cm) long, Mexican milk snake, *Lampropeltis triangulum annulata*.

The snake froze in the light. I then ran

down the embankment and picked up the prize. Observing him in the beam of our flashlight, the animal was quite calm, unlike the demeanor of many subspecies of milk snakes, and did not seem to resent handling at all. As we walked back to our parked Nissan truck on this small, isolated road in south Texas, we saw nothing more than a freshly tailless Great Plains skink, *Eumeces obsoletus*. A few days later, our newly captured milk snake defecated lizard scales in the snake bag, which we surmised may have been that hapless lizard's tail!

We had spent the last four days in an inexpensive south Texas motel room. The key to comfort was a powerful air conditioner that worked marvelously to maintain cool temperatures during the day while we slept, so that we could spend the

evening looking for snakes. During the nights, we saw many snakes crossing the road and, as we walked along the road on any given night, up to 20 snakes were observed. These included the western diamondback rattlesnake (*Crotalus atrox*), Texas long-nosed snake (*Rhinocheilus lecontei tessellatus*), Mexican hook-nosed snake (*Ficimia streckeri*), bull snake (*Pituophis melanoleucus sayi*), glossy snake (*Arizona elegans*), and checkered garter snake (*Thamnophis marcianus*). Infrequent sightings included the diamondback water snake (*Nerodia rhombifera*), desert kingsnake (*Lampropeltis getula splendida*) and great plains rat snake (*Elaphe guttata emoryi*). All of these reptiles were welcome sightings, but not were what we were after.

Other non-herp animals of interest



Mexican milk snake (*Lampropeltis triangulum annulata*) from the town of Freer, S. Texas. Notice the bright orange banding (instead of the yellow banding found in snakes from other localities). Populations in this area are often noted for having the orange color.

were both types of vultures (black and turkey), Caracara, scissor-tailed flycatchers, armadillos, and bobcats.

The nights were virtually alive with fauna (and the occasional game warden who would stop us and look at our out-of-state hunting licenses). All of this made for an interesting trip, but, being a typical herper, not a successful one. I had yet to capture a live North American milk snake, although my wife and I found several dead-on-roads — a Mexican milk snake in Texas and two scarlet kingsnakes (*L. t. elapsoides*) in Florida — on our honeymoon. My luck changed that fateful evening on that isolated Texas road at 10:20 p.m. The night had been like the previous four, although the area where we had captured the milk snake had received slight rainfall earlier in the afternoon. The moon was waxing rapidly towards the first quarter, and was quite bright. After that night, we spent three more uneventful evenings in that region with no luck, although we saw many more of the common denizens of the region.

Lampropeltis triangulum annulata occurs from south Texas into Tamaulipas, Mexico (Williams, 1988; Conant, 1991; Mara, 1994). Conant (1991) listed the habitat as ranging from sand dunes to cultivated fields. We have found Mexican milk snakes in thornscrub habitat in southern Texas.

Mexican milk snakes make a welcome addition to any snake collection. They can be remarkably beautiful and are usually quite docile. Tennant (1984) stated that many people keep these snakes as living gems. The snake mentioned earlier has thrived in captiv-

ity, producing over a hundred offspring (thanks, in part, to breeding loans from other people).

In addition to their beauty, Mexican milk snakes are easy to propagate in captivity. Several friends have had them triple-clutch in a season. The babies are easy to start on pink mice. They grow rapidly, often achieving breeding size in 18 months.

The purpose of this article is to discuss how my wife, Eunice, and I maintain our collection of Mexican milk snakes.

Care in Captivity

Cages - Our animals are in one of two types of cages. The first is the Herpatat®

Sandmar® display enclosure utilized by one of our breeder males. The female is housed in the sweater box below the male's enclosure. During the breeding season, the male is allowed access to the female through the 2.25 inch (5.7 cm) PVC fixture. At all other times of the year, the animals are housed separately.



modular cage (Merker and Mackin, 1988). This cage offers a satisfactory subterranean-type microhabitat that these snakes seem to enjoy. Unfortunately my initial adult breeder, now almost 39 inches (one m) long and weighing more than three-quarters of a pound (370 grams), is far too large for the Herpatat® cage. Instead, I keep him in a large display setup manufactured by Sandmar Enterprises. This cage offers large space, 22" x 17" x 22" (about 56 cm x 43 cm x 56 cm), a fluorescent light fixture, and a drawer-type subterranean area, with a Sterilite sweater box as the drawer. Both the Herpatat® cage and the Sandmar® enclosure are heated using a heat tape at one end of each cage. This provides a temperature gradient from which the snakes can select their preferred body temperature. Mexican milk snakes do not need as much warmth as some other colubrids. Therefore, our animals are never allowed access to temperatures in excess of 80° F (27°C) during the spring, summer, and fall, even when they are directly over the heat tape region of the cage.

Substrate - We have used as cage substrate paper towelling, pine shavings, and most recently, CareFresh® substrate. The latter is benign and the snakes thrive on it with very little of the mucus buildup in their mouths that we have observed using other substrates. With some of the pine shavings we have utilized over the years, the snakes developed a condition resembling mouth rot. We believe this was the result of inhaling pine dust on a continual basis. The new CareFresh® is a short fiber

wood pulp with minimal dust. It is almost odorless and has tremendous absorbing power. The downsides of this product are unattractive appearance and expense (about \$18 for a 50 quart (47 l) bag, retail). However, if your snakes suffer chronic colds, mouth rot, or bacterial infections, and if you are using a high-dust pine shaving product, try changing your substrate.

Diet - Feeding adult Mexican milk snakes is seldom a problem. In the wild, they feed on virtually any appropriately-sized vertebrate, including other snakes, birds, lizards, and rodents (Tennant, 1984). As captives, they feed readily on mice of appropriate size. *Lampropeltis t. annulata* have fairly small mouths and are not able to ingest huge 'retiring' breeder mice. We feed ours on a weekly basis — they receive one or two small, recently weaned mice per meal. On this regimen, several of our animals have bulked up.

During the breeding season, we feed females one or two small mice on a bi-weekly basis. The only problem occasionally encountered in feeding *L. t. annulata* is with the occasional neonate. Most neonates accept meals, especially if they are not fed for about two weeks, before being offered a lizard-scented pink mouse. Often, this does the trick with the occasionally stubborn neonate.

Caution should be exercised when housing Mexican milk snakes together. Although we have never had a problem with this species, we have had several mishaps with snakes not usually thought to feed on other snakes in the wild, for example, gray rat snakes (*Elaphe obsoleta spiloides*). The potential for *L. t. annulata* to feed on each other is a definite possibility. With this in mind, we separate our neonate milk snakes into individual enclosures.

Breeding - Mexican milk snakes are among the easiest tricolored kingsnakes to breed under captive conditions. Our animals are cooled during the latter half of November through mid-February. Prior to the cooling period, it is imperative to fast the snakes for a two week period while maintaining the animals at their summer/fall temperature. This allows for the proper digestion and expulsion of any food left over in their gastrointestinal tract. Failure to do this results in food remaining in the gut under suboptimal temperatures, setting up a potentially lethal situation.



Thornscrub habitat prevalent throughout much of south Texas. This is prime area for the Mexican milk snake.

Table 1. Breeding data for the Mexican milk snake (*Lampropeltis triangulum annulata*) from 1987 to 1994. Incubation temperatures were approximately 77° F (25°C) for 1984–1992 and 81° F (27°C) for 1993 and 1994. Brumation began during the middle of November and ended by 14 February in all years.

Year	N	Breeding Dates	Oviposit Dates	Clutch Size %	N	Fertility	Incubate Time (days)	Hatch %
1987	3	3/25–4/5	4/25–5/23	5.7	4	100	61–64	94
1988	2	3/11–3/25	4/25–5/5	5.5	2	82	60–65	100
1989	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	3	3/19–4/7	4/25–5/16	9.0	3	100	61–63	96
1993	2	3/12–3/26	5/10–5/14	9.0	2	94	54–56	100
1994	3	3/16–4/24	5/17–6/9	9.3	3	75	54–57	80
1995	3	3/15–4/20	5/16–6/5	7.0	3	90	54–57	85
1996	2	3/26–5/17	5/14–5/27	8.0	2	75	53–58	100

N = sample size.

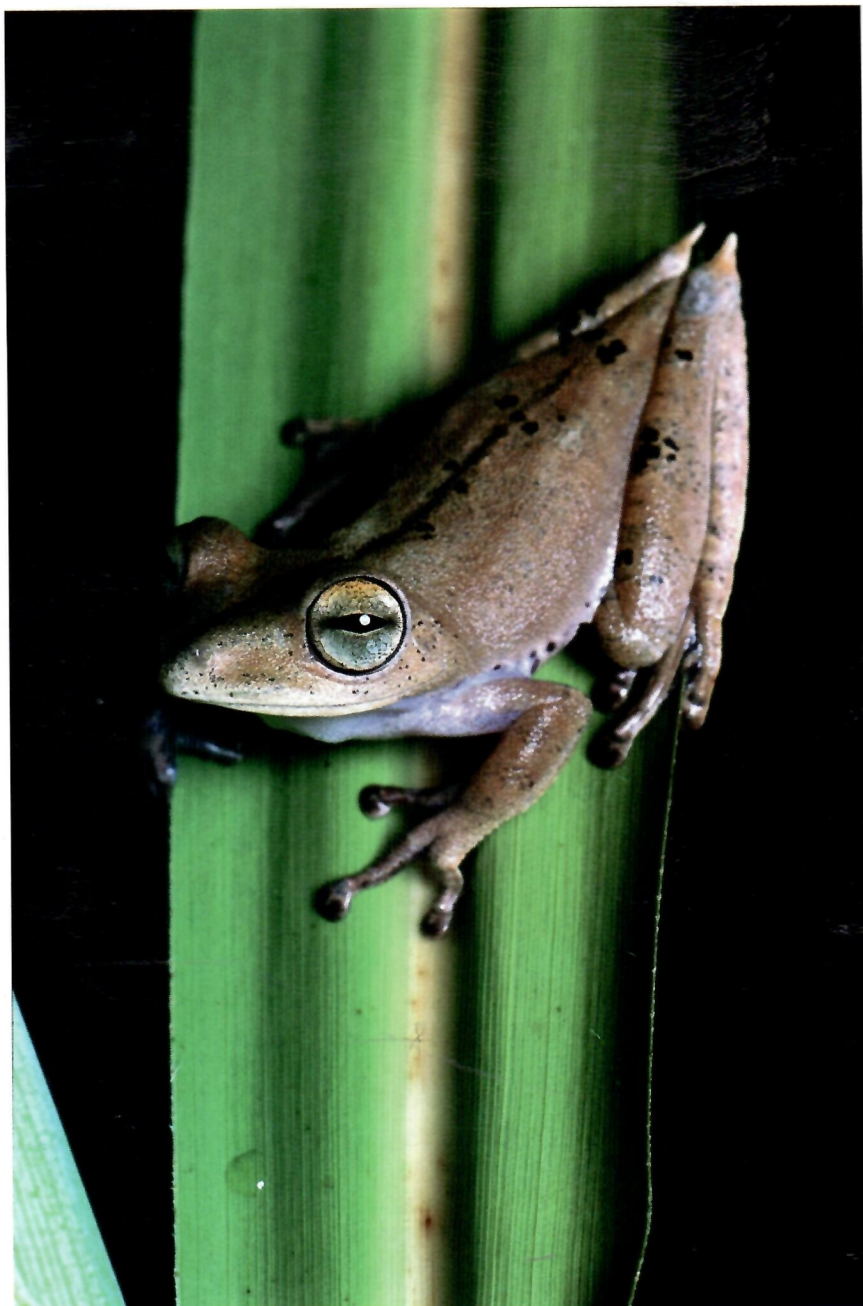
Once the fasting period is over, then and only then do we cool the snakes down. The heat tape is turned off, letting ambient temperatures decrease to room temperature, usually from 50–57° F (10–14°C). Snakes do not undergo a true 'hibernation.' Indeed, ours usually behave the same as during the summer and fall; they move about and drink water, albeit at a slower pace.

On or about Valentine's Day, the heat tapes are turned on again. Complete activity of the snakes is restored. The Mexican milk snakes resume feeding within one or two days and are especially eager to eat at this time. This is when we feed all of our animals heavily, particularly the females. It is easy to make these milk snakes look like a tricolored rosy boa (*Lichanura trivirgata*), if one is not careful!

Sometime in late March or early April, breeding begins. The latest we have observed breeding in our colony has been in the middle of May.

Most other times of the year we house the sexes separately. The breeding sequence begins shortly after the female is placed in the cage with the male. The male inspects the female within three minutes of her placement in the cage. Soon after, the male rubs spasmodically the back of the female along her entire length. If the female is ready to breed, she lifts up her tail and the male places one of his hemipenes into her vent. Sometimes this is accompanied by a copulatory grasp; the male bites the female on her neck and remains in this position until copulation is over. We have also observed this behavior in Taylor's milk snake

Continued on page 68



Troschel's Treefrog (*Hyla calcarata*). Only one strobe was used. The lighting is rather poor and there are dark shadows.

Camera Mounted Flash Photography

by Jim Bridges. All photos by the author

While camera mounted flash photography is the answer to many photoherpetological problems, the lighting this type of setup produces is limited to "snap shot" quality. It might seem that automatic strobes are the best way to go. Nothing could be farther from the truth.

Automatic flash units have an *electronic*

eye that reads the light bouncing off a subject and shuts off the strobe when enough light is bounced back to the eye. Through-the-lens (TTL) systems use an electronic eye built into the camera's body to do the same thing. While the TTL systems compensate for light lost through lens extension, neither exposure system is accurate enough for slide films nor herp photography.

Automatix - Automatic strobes cause noticeable color shifts in the response of films. This is because automatic flashes do not actually get brighter or dimmer. Instead, the light burst gets longer or shorter. An automatic flash can fire as fast

as one twenty-thousandth of a second. While this short burst of light can "freeze" almost any movement, your film cannot record properly at such extreme speeds. Each photograph taken at a different distance with an automatic strobe will have a dissimilar duration of light and a contrary color balance. If you were shooting print film, the person working the computer printing your pictures could correct these color changes. (That is, providing he or she knew the correct color of your subject, and cared). Slide film frames cannot be corrected individually, and we're shooting slide film (see *The Vivarium*, Vol. 8 No. 3, *Herp Photography: An Introduction*).

In addition, automatic units are fooled easily. The classic failure situation of one small subject on a lone stick, a few feet from any background, is a common one in herp photography. The relatively small size of our subject in relationship to the farther away background will fool the *automatix* into overexposure of our subject. By moving the subject and background closer we diminish the exposure difference between the foreground and background. However, in doing so, any living herptile will probably be turning away from our camera and trying to get into the background. A better solution is to leave the scene alone and turn off the *automatix*.

Lighting - A single flash unit mounted on our camera can be used to illuminate any herptile for the purpose of photography. However, unless this strobe is very large and diffused (such as an umbrella or a *softbox*, see *The Vivarium*, Vol. 8 No. 3, *Herp Photography: An Introduction*) the resulting image will have an impenetrable hard edged black void for a shadow.

Shadows are necessary to reveal form in shapes. They should not be solid black areas, however, devoid of all detail. For this reason it is better to use two strobe units mounted via a bracket to a camera. These flash units are placed above the lens axis so that they have to be aimed down at the subject and are directed criss-cross over the area of the subject when it



Troschel's Treefrog (Hyla calcarata). Properly exposed subject photographed using two strobes set manually.



Subject photographed using automatic exposure and two strobes.

is in focus. By placing the strobes above the lens axis, we produce a more natural "light from above" look. This lighting is much more appealing than that created by ringlights or other strobes mounted on the lens axis. Each flash is aimed so that one unit fills in the shadow created by the other unit.

A second flash can be *slaved* to the unit connected to the camera. (A *slave* is a small electronic device that can plug into a strobe unit, enabling any unit to synchronize with every flash that fires, *even if it's not yours!* Keep this in mind when you go photographing with other photographers.) These units do not have to be the same power. If your second flash is one-half or even one-quarter the power of your primary unit, the combined effect will produce a visible, yet detailed shadow. Many flash units can be set manually at different powers to enable a lighting ra-

tio to be worked out. Masking out areas of strobes' output can also cut down on the power of a unit.

Manual operation is not difficult. Light increases or decreases in proportion to the distance it travels. By picking a few reference marks on our lens barrel and photographing at those distances, we can make our photographic lives a lot easier. Some ideal reference points for us are the four magnification marks scribed on most macro lenses. When the flash units are mounted to the camera, every time you turn your lens to one of those selected marks, the magnification and flash-to-subject distance will be the same when you bring your subject into focus.

Once you determine your flash exposure for that distance, that exposure will *theoretically* always be the same for that film. (Experience has shown me, this is

not always the best exposure. Electric yellow juvenile green tree pythons, for instance, photograph better one-half f stop under exposed, and jet black subjects photograph better a half-stop over exposed. This is one reason why you must be a thinking photographer not an automatix photographer.) Once you adapt to this system of photography, neither the size of your subject nor the distance in front of the background will matter. The amount of light hitting your subject will always be a known constant. The only adjustments to be made will be those discretionary exposure adjustments all professional photographers make without *bracketing*.

To determine this exposure you must know the output of your flash for the film you will be using. Your flash instruction booklet may have a list or chart showing *guide numbers*, or set the ISO number on

the calculating scale of your flash. Multiply the f stop given at ten feet by ten. This is your guide number or power output for your flash at that ISO rating. By dividing the flash-to-subject distance into your guide number, you are able to figure your f-stop for that distance. (Some of the f-stops may be a little odd. An $f27.7$ would be between $f22$ and $f32$, closer to $f32$). Because of variables too numerous to cover in the space allotted, this f-stop is only an approximate exposure, a starting point for figuring your exposure.

You must now expose a test roll of film. Bracket your exposure, in one-half f-stop increments for at least two f-stops above and below your approximate f-stop. (A half stop is in-between the f-stop numbers; *yes it will work in between*). If you are using two flashes, use the guide number of the strongest unit or, if they are the same power, bracket three f-stops above. A two or three stop range is a sloppy approximation, but this range should cover all the possible variables for the lenses used today.

You may find your strobes are too powerful. Either use a lower ISO film or cut the power of your flashes. Placing something in front of your flash to diffuse the light can help. (I will warn you ahead of time, there are not many substances that are neutral in color. Finding material that will not impart unwanted color into your image can be very difficult).

Working outdoors - If you plan to use this setup outside, your test should be done outdoors. (It is amazing how much light bouncing off the walls can affect the exposure). Make an exposure test at every reference mark you've selected with and without the life size adaptor. Don't forget, one f-stop of light is lost when using a life size adaptor. Be sure your lens is not shadowing your subject. Also, re-aim your flash units for each distance. Failure to re-aim your flash after a change in magnification is a major oversight, but a common mistake. Marking the adjustments on your flash bracket with different color indelible markers can make changing magnifications a lot easier in the field.



This may sound like a lot of trouble, but you must perform all of the above tests when setting up automatic strobes for the first time, too. The advantage to this system is, once you've worked it out, you will be able to concentrate on photographing, safe in the knowledge that each exposure will be correct, regardless of the circumstances. 🐸

Above: Troschel's Treefrog (*Hyla calcarata*) photographed using two strobes. The lighting is much better than on the first page image. There are few shadows.

Left: Argentine Horned frog (*Ceratophrys ornata*) Strobe "fall-off" was caused by poorly aimed strobes.



Popular Arizona Natives in Herpetoculture, Part 1: Rosy Boas

by Petra Spiess

For many, the word **Arizona** conjures up images of expansive, barren sand dunes and monuments of sun-bleached rock. Yet Arizona is a state of incredible diversity, both in ecozones and wildlife. Climatic zones range from the hot and dry Sonoran desert to the alpine meadows atop Humphry's Peak, Arizona's highest mountain. Those who have never been to Arizona and seen its splendor may believe that the desert zones are devoid of life, when in fact, the opposite is true. In the harsh climate of the Sonoran desert, life is subtle but abundant, and can be seen on display if one is patient and observant.

Corresponding with the incredible diversity of Arizona's ecozones is an amazing number of popular reptile species, commonly kept and bred in herpetoculture. Among the most popular is the rosy boa, *Lichanura trivirgata*.

Rosy Boas

Snakes of this species are small, rarely exceeding 36 inches (91 cm). They are hardy, beautiful, and relatively easy to breed. Their ground color ranges from tan to silver. Dorsal markings or stripes range from deep chocolate to orange.

Rosy boas range over much of the southwestern half of the state. (Stebbins, 1985). Snakes from some localities have extensive speckling. Also, juveniles from some localities have chocolate stripes, while adults in the same habitat, have orange stripes.

Rosy boa taxonomy is still being refined. Many sources list two subspecies of the rosy boa for Arizona, *Lichanura trivirgata trivirgata*, the Mexican rosy boa, which has a restricted range in extreme southwestern Arizona, and *Lichanura trivirgata gracia*, the desert rosy boa, which is found across the rest of the state. In a review of the genus by Spiteri (1993), however, *Lichanura trivirgata gracia* is grouped with *Lichanura trivirgata myriolepis*, the mid-Baja rosy boa. Spiteri also proposed that a new subspecies, *Lichanura trivirgata arizonae*, the Arizona rosy boa, exists in west-central Arizona.



Wow, an arboreal rosy boa! Rosy boas are typically terrestrial, but this individual has decided to give the juniper tree a try anyway. Photo by the author.

Rosy boas in Arizona often inhabit desert scrub containing prominent and abundant boulder piles. These are utilized for hiding, estivation, and hibernation. Rosy boas are also found in rodent holes, which may serve as hiding areas as well as sources of prey. Although macrohabitats of rosy boas are low in relative humidity (about 15–30%), they are often two to three times more humid than the surrounding area.

Rosy boas are infrequently seen during

daylight hours in Arizona. Normal periods of extended inactivity are responsible for this assumption. Rosy boas spend a significant amount of time inactive in hiding areas, and venture out only when looking for a mate or food, or when thermoregulating.

Most rosy boa activity occurs in the spring and summer months. In the spring, rosy boas are mainly crepuscular, but as the temperature rises during the summer months, they become almost ex-

clusively nocturnal. Rosy boas have been observed moving across roads when the ambient temperature was as low as 68° F (20°C). Thus, the best time to find rosy boas is in the early morning or evening hours of late spring when the relative humidity is moderate to high (50–80%). An ideal day for rosy boa activity includes a sunny morning, a brief afternoon shower to raise the humidity, and an overcast afternoon and evening. If searching for rosy boas during the summer months, look after sunset when there is little or no moonlight.

Interesting habits - Rosy boas, which the author has observed, both during the day and at night, move with a peculiar jerking motion to their head. As the snake progresses, its head moves forwards and backwards. This aids to break up the animal's body outline, as birds of prey (hawks and owls) often prey on these snakes.

When molested, a rosy boa will roll up in a ball with its head in the center and its blunt tail sticking out. As a result of this behavior, many wild rosy boas are missing a significant portion of the tip of their tails, as predators attack the tail.

Wild rosy boas are docile and rarely bite. However, the author has been bitten by more captive-born rosy boas than by other, more aggressive species. Captive-born rosy boas may best be described as feisty as they often associate people with food.

Captive care - Wild-caught rosy boas may have a difficult time acclimating to captivity. They may refuse to feed for months. Witwer (1996) suggests that providing a naturalistic environment may help wild rosy boas better acclimate. Captive-born rosy boas typically have little problem acclimating, and are generally superior to wild-caught animals in all respects as pets.

Wild-caught rosy boas must be deparasitized, for these snakes may carry internal parasites. After the snake has been set up in a quarantined enclosure, collect a fresh stool sample for immediate examination by a qualified reptile veterinarian. Fecal exams determine which parasitic organisms are present, and treatment can be adjusted to produce the best results.

Rosy boas are hardy captives if provided with the proper conditions. I house my adults in enclosures 3 x 2 x 2 feet (1 x 0.66

x 0.66 m) (1 x w x h). Enclosures should be large enough to provide a proper thermal gradient. A thermal gradient from 70–75° F (21–24°C) to 85–88° F (29–31°C) is ideal. Gravid females however, should have a warm spot of 88–92° F (31–33.3°C) available during gestation. Avoid humidity in excess of 60% for extended periods.

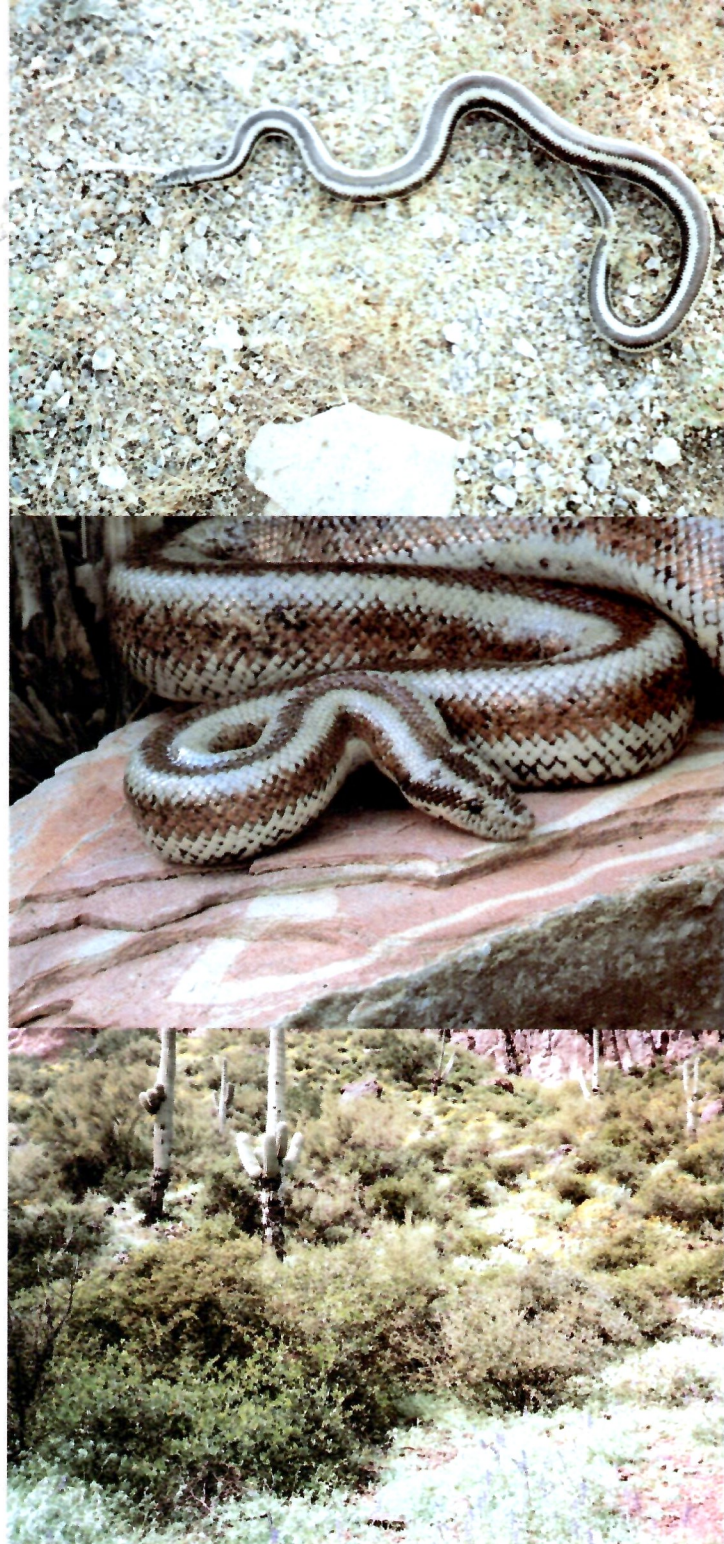
Suitable substrates include newspaper, smooth dry pea gravel, or materials collected from rosy boa habitat. No matter which substrate is utilized, always provide rosy boas with areas suitable for hiding at both ends of the thermal gradient. The snake must be able to fit its entire body into the hiding spot. Rosy boas are secretive and may become stressed if not provided with an appropriate place to hide.

Captive-born rosy boas are generally very good rodent feeders and can be started on pinkies. However, wild-caughts may have some difficulty adjusting to a diet of domestic mice. Domestic bred deer mice can be used.

Breeding - The rosy boa is a relatively easy snake to breed. Generally, rosy boas are sexually mature at three years of age.

Male rosy boas possess observable spurs on each side of the vent. For females, spurs are very small or absent. Probing, however, ascertains sex definitively. Males probe to a depth

Continued on page 69



Top: This juvenile Arizona rosy boa was found in the exact same habitat as the adult climbing the tree. Rosy boas in this area change color as they mature. Photo by the author

Center: A nice captive specimen of Arizona rosy boa. All of the rosy boas are becoming increasingly popular in the pet trade and are now captive-bred in large numbers. Photo by Gerold Merker

Bottom: Typical Arizona habitat of the rosy boa. Photo by the author.

How to place a classified Ad in The Vivarium

Type or clearly hand write your ad in 30 words or less for a total of \$15.00. Any ad over 30 words costs \$0.50 per additional word. Payment must be made in advance and must include the correct amount in order to be placed in the next issue. Classifieds that run for one year (6 times) paid in advance, qualify for a 5% discount. For additional information, call (760) 747-4948 or fax (760) 747-5224.

Send your classified to: **The Vivarium Classifieds**, P.O. Box 300067, Escondido, CA 92030-0067.

Issue	Deadline
Volume 8.6	July 25, 1997
Volume 9.1	September 10, 1997

NEW! Photo-Classified Ads! Starting with this issue, we offer classified advertisers the opportunity to include a color photo for an additional \$60.00 -or- black and white photo for an additional \$35.00 with their classified ad. For color, send a print or duplicate slide. For black and white, simply send a black and white or color print photo (no slides) along with your ad copy.

ANIMALS



CHACOAN MONKEY FROGS (*Phyllomedusa savayana*) captive-bred, 75.00 and up. See article this issue. Sandfire Dragon Ranch P.O. Box 3152, Vista, CA, 92085. Tel: 760.726.4878 Fax: 760.726.9980



ALL CAPTIVE-BORN - CURRENTLY AVAILABLE: Boas - Amazon basin emeralds, Dumeril's, Argentinians. Pythons - green trees well started from high yellow or turquoise blue w/black highlighted adults. LATER IN '97: Boas *Sanzinia*, emeralds, Peruvian redtails, Brazilians. Pythons-Aru and other locality green trees, ball, Malaysian bloods. Guaranteed feeding. Quantity discounts call Mark (215) 453-7026.



STORES WANTED! One of the largest selection of amphibians and reptiles available wholesale to stores only. Find out why so many businesses have selected us as their primary wholesale source. **REPTILE HAVEN** 2205 E. Valley Pkwy, Escondido, CA 92027 Tel: 760.741.0127 Fax: 760.489.6778



AGAMA INTERNATIONAL Captive-bred Australian water dragons (*Physignathus lesueurii*), Lacertas, Argentine black and white tegus and more. 10514 Chilton Rd. 73, Montevallo, AL 35115. Tel: 205.665.2192



REPTILE SPECIALTIES. The largest selection of arrow frogs in the U.S.A. John Uhern Tel: 818.352.1796 Fax: 818.353.73



Large pythons and albino ball pythons are our specialty! **BOB CLARK CAPTIVE-BRED REPTILES** 12316 Val Verde Drive, Oklahoma City, OK 73142. Tel: 405.722.5017 Fax: 405.749.0798



PROFESSIONAL BREEDERS™ - Specializing in the development and refinement of **EXTREME QUALITY** color and pattern versions of the following available offspring: Reticulated Gila Monsters, Albino & heterozygous Coastal Rosy Boas (new pure coastal Temecula Valley strain), San Gabriel Mountain Rosy Boas, 50-50 Desert California Kingsnakes with 70-85% white, Golden-Yellow California Kingsnakes, Hypomelanistic Florida-brooksi Kingsnakes, Tarahumara Mountain Kingsnakes (*L.p. knoblochi* - Types I, II, and III), Arizona Mountain Kingsnakes, Santa Cruz Mountain Kingsnakes (*L. z. multifasciata*), Peach phase 'leonis' thayeri, Albino Queretaro Kingsnakes (*L. ruthveni* - 3 color phases), Albino & heterozygous Blair's x Queretaro Kingsnakes (light phase *L. alterna* x *ruthveni*), Albino & heterozygous peach thayeri's Queretaro Kingsnakes, Albino & heterozygous Arizona Mountain x Queretaro Kingsnakes, Albino Honduran Milk Snakes and outbred tangerine phase heterozygous albinos, 'Super Hypo Extreme Tangerine' Honduran Milk Snakes, Albino & heterozygous Nelson's Milk Snakes. Additional highly sought-after varieties are available. Package pricing combinations are offered. International orders welcome with all CITES permits available. Our attention to all of the details including providing husbandry and rearing guidelines specific to each variety ensures first class customer service and satisfaction for each order. VISA, MC, AMEX, & Discover accepted. To receive an annually updated descriptive catalog and 2 full-color poster reprints (11 inches x 25 inches each) depicting multiple color and pattern morphs, send a one-time fee of \$4.00 to: **PROFESSIONAL BREEDERS**, Steve and Karen Osborne, 22 Snowshoe Flats, Whitefish, MT 59937 USA; phone or fax (800) 487-9658 or (406) 862-9220. E-mail: probdrmt@netrix.net. Visit our web site at <http://www.herp.com/probrd/>



VPI PYTHONS. SPECIALIZING IN PYTHONS, BOAS, SANDBOAS, AND KINGSNAKES. DAVE AND TRACY BARKER, OWNERS. PHONE/FAX (210) 537-5000. We would like to do business with you - we offer quality animals combined with excellent information, support and service to our customers. We currently maintain the largest and most diverse collection of pythons in the world; in the past five years we have captive-bred 29 species and subspecies of pythons. We are documenting our work with pythons in our *Pythons of the World* series - the first volume on Australian pythons published, the second volume on the pythons of Indonesia and Papua New Guinea is in progress. We also produce an assortment of captive-bred boas, sandboas and kingsnakes, and we are working on

many projects to produce uncommon species and unusual mutations. 1997 production should include boa constrictors (albino and hypomelanistic), ball pythons (albino, axanthic, and melanistic), dwarf pythons, blood pythons (albino, het-albino, red and yellow), black-headed pythons, womas, short-tailed pythons (spectacular Borneos and Sumatrans), olive pythons, carpet pythons (jungle, New Guinea and coastal), Lesser Sunda pythons, Savu pythons, black white-lipped pythons; several varieties of scrub pythons, reticulated pythons (yellow-headed, tiger, super-tiger, black-eyed and calico), flame-race sandboas, brown sandboas, East African sandboas, black milk snakes, gray-banded kings, Chihuahua mt. kings, Greer's kings and lots more. Our hatchlings are all individually caged and fed. Nothing is shipped until feeding well. WE PAY SHIPPING ON U.S. ORDERS OF \$500 OR MORE. To regularly receive our availability-and-price list (4 or 5 mailings per year) send \$2 to: VPI, P.O. Box 300, Boerne, TX 78006.



MONITORS! Captive-bred *similis*, hatchling black-roughnecks, large Malayan water monitors and more. Reptile Haven, 2201 E. Valley Pkwy, Escondido, CA 92027. Tel: 760.741.0127 Fax: 760.489.6778.



CHINESE LEOPARD GECKOS (*Goniurosaurus lichtenfelderi*) captive-bred \$250.00 ea. Sandfire Dragon Ranch, P.O. Box 3152, Vista, CA, 92085. Tel: 760.726-4878.

QUALITY REPTILES at affordable prices. Snakes, lizards, turtles, tarantulas, frogs and a complete line of dry goods and frozen feed. For free monthly price list call or send SASE to Special Care 5, W. Prospect Ave. Pittsburgh, PA 15205. (412) 928-9433. Fax (412) 279-2913.

GREEN TREE PYTHONS: Our blue female has produced exceptionally large clutches. All offspring are captive born, well started and come with complete feed records, and individual histories. A comprehensive owners manual is included with each purchase to maximize your success with the animals we provide. Buy from a source that provides quality and service not just massive quantity! Contact Rico at (423) 886-7872 or write SIGNAL HERPETOCULTURE, PO Box 204, Signal Mtn. Tennessee 37377. Look for us on the World Wide Web at <http://www.starbase21.com/sigherp/>

ALBINO BOA CONSTRICTORS and possible heterozygous boa constrictors due early August. My collection is small but maintained very well with over 20 years breeding experience. Please call Gary Lum, (301) 972-6314.

QUALITY captive produced snakes, Boas: Hogg Island, Surinam red tails, Bolivian *amarali* red tails, Dumeril's. Pythons: Womas, diamond pythons, yellow and black jungle pythons. Our bloodlines were CAREFULLY selected and guaranteed to be exceptional. Top quality is the nature of our business. For more information PLEASE contact Tim Belknap, P.O. Box 574 Canoga Park, CA 91307, (818) 999-1436.

LEOPARD GECKOS (quality wholesale prices) also designer & leucistic available. Womas, Dumeril's, rainbow boas, Albino red-eared sliders, many others. Send SASE for free list. Don Hamper, 1215 Fishinger Rd, Columbus, Ohio 43221, (614) 457-4433 (7-9 PM est) (614) 459-4261 Fax.

HAWAII JACKSON'S CHAMELEON CONNECTION. Your reliable source for top quality Jacksons. Quantity discounts available. Pet shops, wholesalers and brokers only. (808) 242-7418.

ARABESQUE BOAS. Spectacular new boa constrictor mutation. This will be the second litter ever produced! Limited numbers available. Also expecting rainbows, Dumeril's, red tails, carpets, bloods, and more. SASE for 96-97 list to: EXCEPTIONAL EXOTICS, P.O. Box 19227, Louisville, KY 40259, ph (502) 955-8705.

MIDWEST REPTILE FARM. Beautiful, captive born babies! Bearded dragons, many unique color morphs, \$35-60; veiled chameleons, \$35-60; panther chameleons, \$60-75; leopard geckos, \$20-30; Northern blue tongue skinks, call for price; Also expecting frilled lizard babies! Call for prices as well as other available herps! Conveniently located in Chicagoland area. We ship nationwide. Call (708) 539-7025.

DAVID BLAIR'S CRITTER CORNER: RHINOCEROS, CUBAN AND CAYMAN ISLAND ROCK IGUANAS from the largest and most experienced Federally licensed breeder in the nation! All animals are certified captive bred and hatched at our own facility in California. We produce the finest *Cyclura* iguanas in the world and offer them at the lowest prices. Quantity discounts available. Call David Blair at (760) 746-5422. Permit #PRT-728168.

JUNGLE CARPET PYTHONS (some of the brightest and pure jungles in the country). Large quantities & wholesale prices available on other quality reptiles such as albinos & normal colors of Burmese, pythons, cornsnakes, Sonoran gophers, California kings, and western diamondback rattlesnakes. Also available: Dumeril's, ground boas, Bay of L.A. rosys, coastal rosys, Baja rosys, gray banded kings, Arizona mt. kings, Nelson's milks, Sinaloa milks, Pueblan milks, tangerine Honduran milks, banana kings, desert kings, Mexican black kings, Taiwan beauty snakes, black pines, Western hognose, leopard geckos & red phase (outcrossed) bearded dragons. For info or price list contact Brad, Megan, or Alan at BRAD'S WORLD REPTILES, 6700 NW Hwy. 99 W. Corvallis, Oregon, 97330. ph. (541) 745-7626, fx. (541) 745-2073.

PURE-BRED CUBAN IGUANAS! Captive-bred *Cyclura cornuta*, 8 bloodlines, F1 + F2 + F3 breeding pairs, adults, subadults, worlds largest private breeder, highest quality animals at best prices to good homes. We will beat any price. Robert (305) 872-9811.

CAPTIVE-BRED PANTHER CHAMELEONS Ambanja blue, Nose Be blue, and Diego Suarez color phases. 3 Months old. Call John (602) 893-3931.

(Expected 97, deposits accepted) **PYTHONS**-black-heads, womas, jungle carpets, rings, bloods (red and

black), and Childrens. **BOAS**-emeralds, Hogg Islands, Madagascan tree (*Sanzinia*), Bolivian redtails, Brazilian redtails, Brazilian rainbow, Dumeril's, and sand boas. **TORTOISES** - Aldabras (3"-36"), Hermann's, marginateds, red foots, leopards, and others. For price list send a one time fee of \$3.00 which includes a '97 list (and all future lists) and color photos. **DICK GOERGEN**, PO Box 225, Alden, NY, 14004, (716) 681-4518.

FREE PRICE LIST of exceptional captive-bred snakes. Many uncommon varieties such as axanthic Trans-Pecos rats, albino *ruthveni*, black milks, undescribed "Nuevo Leon" milks, New Mexico milks, Tamaulipan rats, Baja rats, locality leopard rats, super-orange Cape gophers, Louisiana pines, boas, pythons and many others. Call, write or fax **JIM KANE**, HCR 1, Box 1537-B, Tucson, AZ 85736. (520) 822-1954; e-mail: jkb@AZStartNet.com. Web site: <http://www.vivanet.com/~kanej>

R&M HERPETOCULTURE: Specializing in high quality captive bred **PYTHONS:** D'Albert's, diamond cross, Children's, spotted, jungle Macklots, Borneo blood. **BOAS:** Brazilian rainbow, Dumeril's, Peruvian, rosy and sand. **COLUBRIDS:** Milk snakes, kingsnakes, beauty, ratsnakes - Trans Pecos and geckos. To receive a price list call (408) 374-9407, or write R & M Herpetoculture, 1435 Marsan Ct, Campbell, CA 95008.

EXPECTING IN 1997: Albino boas, possible het and normal boas, albino, green, albino-green and normal Burmese. Call or write Bob Hammond, PO Box 5418, Cleveland, TN, 37320, (423) 478-2020.

BRAZILIAN RAINBOW BOAS. Babies from gorgeous orange parents, Retail/wholesale (quantity discounts ... inquire). Specializing in Brazilian rainbows exclusively. Send stamp for additional information and photographs. Scott Schuett 1820 Bigelow, Toledo, OH 43613. (419) 473-0518. Web site: www.nlogix.com/~hanley/scott/ Or email: Scott.Schuett@to2tbb.com

C.B. BLACK BLOOD PYTHON hatchlings (*P. c. curtus*), beautiful and gentle, \$250. Expecting soon: Ball, Borneo short-tailed, Brazilian rainbow, Burmese (normal), Colombian boa constrictor, Indian, spotted and Sri Lankan pythons. Catalog available. **PARTS IS PARTS**, PO Box 1352, Broadheads ville, PA 18322-1352. ph/fax (717) 992-9043.

MOTLEY COLOMBIAN BOAS, blood boas, blue phase b/w tegus pictured in The Vivarium 8.2. Call to get on the waiting list. Also red & Argentine b/w tegus, Cape monitors, rhino iguanas, Rankins dragons plus much more all domestically captive bred for 1997. Call Ron St. Pierre ph/fax (305) 685-3725.

NEW CALEDONIAN GIANT GECKOS - Two adult male "Grande Terre" form *Rhacodactylus leachianus* 3 years old captive-bred and raised from animals collected by Frank Fast near Yate, New Caledonia. This is the giant form that grows much larger than the insular forms imported in recent years - \$1,500 ea. One adult male insular form *Rhacodactylus leachianus henkeli*: outstanding color and pattern - \$1,200. Two hatchling insular form *leachianus* at \$750 ea. Accepting reservations for 1997 hatchlings and for crested geckos, *R. ciliatus* at \$175 ea. Specimens are from legally collected adults. AVS, Inc. ph (619) 258-2629 fax (619) 258-7262.

GECKO RANCH features 39 species and subspecies of geckos (23 *Phelsuma*)! '97 cb offspring will include *P. klemmeri*, *Oedura castelnaui* (amels too), *O. monilis*, *Paroedura androyensis*, *Nephruroides levis levis* and many more! We also feature Snakewear embroidered apparel. Check us out at <http://www.geckoranch.com> or send a SASE to Gecko Ranch, PO Box 318, Davis, CA 95617-0318, phone/fax (916) 759-8158.

NOW AVAILABLE TOP QUALITY BREEDING STOCK: Red/gold dragons \$65-\$120; norm. bearded

Classifieds

\$30-\$300. Leopard geckos \$18-\$60. For price list send a SASE to ATOMIC LIZARD RANCH, PO Box 5644, Bisbee, AZ 85603, or call (520) 432-9161, fax (520) 432-2352.

ANERYTHRISTIC NEW MEXICO MILKS (*L. t. celsaeops*). Black and white with lavender saddles. Parents collected in Hobbs, NM. Only a few animals have been produced to date. Great opportunity for serious investors. No deposit required for waiting list. Photos \$1, free price list - send SASE. The Leather Egg Shop, PO Box 2763, Danbury, CT 06813. (203) 743-1810, Jim.

AUSTRALIAN FRILLED DRAGONS captive-bred, bearded dragons, veiled chameleons, plus panther chameleons. Discounts for quantities call for info: Frank Kauzlarich (510) 562-8118.

KEVIN JOHNSON REPTILES. Albino boa constrictors and heterozygous boas expected mid June. Multiple bloodlines available. This will be my second year producing these gorgeous animals. For more information contact KEVIN at (516) 736-9362.

ONLY CAPTIVE BORN - CURRENTLY AVAILABLE BOAS - Brazilian Rainbow, Dumeril's, Emeralds & Argentines. **PYTHONS** - Green Trees (All Localities), Childrens & Ball (various morphs). **LATER IN '97:** BOAS - Amazon Basin & Northern Emeralds, Peruvian, Surinam & Guyanan Redtails, Solomon Island Tree. **PYTHONS** - Aru & Biak Green Trees, Jungle & Queensland Carpets, Bloods and unusual Balls. All are CB, well started, guaranteed feeders. Quantity discounts. Call MARK @ (215) 453-7026.

BALL PYTHONS (All CB) Striped, Ghost, Axanthic, Clown, Jungle, Melanistic, Chocolates, Caramel Albino, Black and Gold. Also CB *Rhacodactylus* species. Tom (706) 369-6838.

PETER KAHL REPTILES: If you are interested in **ALBINO BOA CONSTRICTORS** look no further. We are the first and largest producers of albino boas, snow boas, striped albino boas, double heterozygous (albino x anerythritic), and double heterozygous (albino x striped). All of our bloodlines are 100% compatible. Breeding projects include: BOAS- albino, snow, striped albino, double heterozygous (albino x anerythritic), double heterozygous (albino x striped), double heterozygous (albino x arabesque), double heterozygous (anerythritic x hypomelanistic), heterozygous (albino x argentine), heterozygous (albino x Surinam/Peruvian), hypomelanistic, jungle (new pattern mutation), and Brazilian rainbow. **PYTHONS** - albino reticulated (this albino is pure white, yellow and orange with red eyes. Completely amelanistic), lavender phase albino reticulated (off white, yellow, and lavender with normal eyes), piebald ball, heterozygous for piebald ball, albino ball, heterozygous for albino ball, and green tree. Visit our NEW WEB SITE AT www.pkreptiles.com. Or send your name and address plus \$1 to: Peter Kahl Reptiles, P.O. Box 150, Long Green, MD 21092 for a NEW COLOR PHOTO PRICE LIST for 1997. You will see when it comes to albino boas and other boas color/pattern mutations we have the best. We accept Visa, Mastercard, American Express, and Discover.

GREAT VALLEY SERPENTARIUM. Wide selection of captive bred colubrids (rear-fanged also), boids, lizards, miscellaneous. Open to the public. Send SASE for price list to G.V.S., 2379 Maggio Circle #C, Lodi, CA 95240, (209) 369-7737, Fax (209) 369-3907.

CAPTIVE BRED LIZARDS. *Pogona vitticeps* \$50-90, *Chamaeleo calyptratus* \$40-60, *Paroedura pictus* \$35, *Uromastyx acanthinurus* \$275, Australian frilled lizards. Care sheets included with all reptiles. Call Griff Logan at (716) 584-3209.

TIGER AND SUPER TIGER reticulated pythons. Very limited numbers are available now! These will go fast,

so contact E.S.P. Reptiles now for best availability on these and other boids. Phone (602) 561-1677, Email, reptiles@texas.net

LIZARDS CAPTIVE BRED. Blue tongue skinks (various), panther chameleons, *quadricornis*, red/gold bearded dragons, frilled dragons, Mali *Uromastyx*, plumed basilisk, leopard geckos, New Caledonian giant geckos (*R. leachianus*) AVAILABLE NOW. (561) 288-4524.

MANDARIN RAT SNAKES. Captive born F1 and F2, unrelated bloodlines, care sheet. Guaranteed healthy, feeding, sexed. Now accepting reservations. \$700 each, \$1300 pair or \$1200 pair if paid in full in advance. Great Valley Serpentarium, Bill Gillingham, 2379 Maggio Circle C, Lodi, CA 95240, (209) 369-7737, Fax (209) 369-3907, wbgill@inreach.com

THE BOA BASEMENT: Double het (ghost), hypomelanistic, het for hypo, N.W. Peruvian, Surinam, Colombian, Argentine and Hogg Isle Boas, Brazilian and Colombian Rainbows, Queensland, Coastal and Brisbane Carpet Pythons, more. For FREE 1997 color photo price list, send SASE to Douglas Matuszak 2171 Delaware Dr., Cleveland Hgts, OH 44106 or call (216) 229-8336.

CAPTIVE BRED EXCELLENCE. Selectively bred colubrids. Good prices, committed customer support, unconditional guarantee. For price list send S.A.S.E. to P.O. Box 35396, L.V., NV 89133-5396 or (702) 655-8582.

LEUCISTIC, HET. FOR LEUCISTIC, DESIGNER AND NORMAL LEOPARD GECKOS. Peach and Normal fat-tailed geckos. Send S.A.S.E., Ray and Denise, 225 Moana Wy., #B, Pacifica, CA 94044 for Price List, (415) 738-9063.

SANU PYTHONS 2.2 Long term captives \$650.00 PR. C.B. Geckos *Coleonyx mitratus* \$35.00 ea. *Paroedura pictus* light & dark banded & striped phases \$20.00-\$30.00 ea. *Paroedura* new species 2XL \$125.00 ea. Leopard geckos \$25.00 ea., etc. Damien Victor G. (718) 277-8658.

ARGUS MONITORS (*Varanus panoptes*) F2 captive bred hatchlings \$275.00 ea. 2 or more \$250.00 ea. Irian Jaya Blue-tongued Skinks captive born and raised adult breeders \$375.00 pr. Call (503) 631-3319.

3.3 BREEDING GROUP OF HAITIAN BOAS (FEMALES GRAVID), \$950; Nelson's milksnakes (probably het. for albino) juv: \$250, adult: \$500. Surplus male breeder kingsnakes/ratsnakes, \$75-\$100; boa constrictors, juv-adult, \$75-\$125. Send for '97 list of quality tricolors, rat snakes and more. Flora & Fauna - West, 5143 Allison St., Arvada, CO 80002 or call (303) 467-2897 (leave message).

For Sale: SAVE THIS AD and use it for a 10% discount on any snake purchase from THE CARPET OUTLET: 6 Bloodlines of Jungle Carpet Pythons and Diamond x Carpet Pythons. All are already priced to sell. Call John at (908) 526-8304 and leave a message.

ALBINO ROSY BOAS. The ultimate Rosy. Beautiful orange stripes on white background. Stock originated from Whitewater Canyon near Palm Springs, California. Taking orders now for 1997 offspring. Send \$2.00 for set of four photos or send SASE for free price list. RANDY WRIGHT, 10519 Hillside Road, Alta Loma, CA 91737. Phone/Fax (909) 989-4017.

CAPTIVE-PRODUCED MANDARIN RATSNAKES SINCE 1990. Hundred Flower, Cave Dwelling, and Leopard Ratsnakes; Striped Gray-Bands; Mexican, Baja, Sierra, and San Diego Mt. Kings; many other captive produced snakes. Send legal SASE for free price list to: Prairieland Herpetoculture, P.O. Box 267, Sidney, IL 61877. Or fax: (217) 688-3009; email: weller@students.uiuc.edu

WHYTE ARK REPTILE: Offers the largest, most diverse instock selection of ARACHNIDS and EXOTIC FROGS in the west. Also many lizards, turtles and snakes of the Highest Quality. Email: Whyteark@pacbell.net, or ph/fax: 408.379.1670 for info.

ALBINO TRICOLORS: AVAIL: 1.0 het/alb *nelsoni* proven breeder; '96 hatch: 1.0 albino *ruthveni*; 1.0 het/albino *hondurensis*; 1.0 possible double het (het/alb plus 50% chance het/anerythritic) *hondurensis*; 1.0 het/anerythritic *hondurensis*. **TAKING ORDERS** for '97 and '98 albino and het *nelsoni*, *hondurensis* and *ruthveni*, hypo and het *hondurensis*, and double het *hondurensis* of several kinds. **WANTED:** 0.2 '96 or older anerythritic *hondurensis*. Terry Dunham, Albino Tricolors, 813-824-0705 before 10 pm EST please.

CAPTIVE BRED, Anacondas-\$150, Sri Lanka pythons -\$300, Diamond pythons, the best blood line of Jungle Carpet pythons in the country - \$450, Green Tree pythons - \$600, Dumeril's boas, Andean Milk snakes, Spotted & Children's pythons. Call Jim Gregg @ (425) 776-3755 or visit my web site @ HTTP://www.seanet.com/~jgregg.

ANERYTHRISTIC KENYAN Sand Boas For Sale. 1.0 anerythritic and 1.3 het for anerythritic '96' c.b. offspring. \$500 for the group. Please e-mail us if interested: lepgecko@earthlink.net

CAPE YORK SPOTTED PYTHONS \$175, leucistic Texas ratsnake \$80, tangerine Hondurans (Dammis) \$100 and up and Western Hognose \$30. Send SASE for photos. Jon Yuhasz P.O. Box 81425 Cleveland OH 44191-0425 216/631-4104

CAPTIVE-BRED CROTAPHYTUS. High contrast Collared Lizards. Beautiful aquaflame and spotted varieties. Ideal desert vivarium subjects. Will breed in one year. Robust juveniles and subadults, easily sexed: 40 - 75.00. If you like Collared Lizards but have been turned off by skinny wild-caught specimens, you need to call me at (760) 738-3256. Thomas A. Jones. MD, Escondido, CA.

CAPTIVE BRED AUSTRALIAN FRILLED DRAGONS from Red and Orange colored adults. Captive-Bred Panther chameleons also Available. Please call Frank at 510-562-8118

GAINES REPTILES, INC. - SOUTH AMERICAN TRICOLOR HOGNOSE (*Lystrophis semicinctus*). First offering in the U.S. of captive bred offspring. Only a limited number will be sold this year at \$1000 each. Albino, 66% Heterozygous & Anerythritic Colombian Boa Constrictors available in June-July. Albino Ball Pythons expected later in the year. Call Bill Gaines at 317-878-4042 or Email bgaines@icnet.com.

GECKOS CB NEW CALEDONIAN GARGOYLE (*Rhacodactylus auriculatus*) **NEW CALEDONIAN CRESTED** (*Rhacodactylus ciliatus*) Chinese Tiger (*goniuosaurus* .1. *hainanensis*) Ocellated Velvet (*Oedura monilis*) and more Sawu Pythons long term captives to Sell or Trade Damien Victor .G. (718) 277-8658

SPECIALIZING IN GECKOS Producing some of Canada's finest *Phelsuma*, *Eublepharis*, & *Pachydactylus*. Now taking orders for *Rhacodactylus auriculatus* & *Uroplatus* sp. All captive bred!! Boas & pythons also avail. Contact Global Aquatics #25 Frederick St., Kitchener Ont., Canada. ph.. 519-579 3116 Fax (0481) <http://www.olbinc.com/Reptiles>

1997 HATCHLINGS: Trans Pecos Ratsnakes, Mexican Hognose, Red Milksnakes 35.00 each, Baird's Ratsnakes, Prairie Kingsnakes, California Kingsnakes 25.00 each, Mexican Milksnakes, Pueblans, Albino Speckled Kingsnakes 50.00 each. *ruthveni* 75.00 each, *thayeri*, Graybands, Durango Mountain Kings 100.00 each, Arizona Mountain Kings 125.00 each. Steve

Mitchener, Oklahoma City, OK 405-748-6566 after 6:00 pm CST

HERE THEY ARE! Albino baby boas, double het for snow, double het for ghost, albino hets. Also available, breeder rainbows, Dumeril's, diamond x carpets, carpets, roseys. Ask for Richard 202-581-1809.

FREE PRICE LIST of exceptional captive-bred snakes. Many uncommon varieties, such as axanthic Trans-Pecos rats; albino *ruthveni*; Black milks; undescribed milks; locality New Mexico milks; Blair's kings; high-grade, highly speckled locality Outer Banks kings; Tamaulipan rats; Baja rats; locality Leopard rats; 'butter' corns; super-orange Cape gophers; Louisiana pines; boas; pythons and many others. Call, write or fax JIM KANE, P.O. Box 85538, Tucson, AZ 85754; (520) 822-1954; e-mail: reptiles@jkb.com Web site: http://jkb.com

LEUCISTIC LEOPARD GECKOS! Leucistic and Hets available now! Call Pek or Mike (562) 697-7110

ALBINO NELSON'S AND HETEROZYGOUS NELSONI, Tarahumara Mtn. Kingsnakes (*L.p. knoblochi*), Bay of L.A. Rosy Boas, Jungle Carpets, Rainbow Boas and more. Send SASE to Mike Haynes, P.O. Box 460751, Aurora, CA 80046-0751. Or call Mike at (303) 699-7023 or Scott at (303) 841-3047.

CAPTIVE BORN RANKIN'S DRAGONS (*Pogona brevis*) Veiled Chameleons 2"-3". Quantity Discounts Available. Call Jason at (305) 654-4448.

ALBINO BOAS AND HETS, for best prices call me last, N.W. Peru blacktail boas, (very rare), Peruvian redtails, hog isle boas, super black & yellow carpets, Brazilian rainbows, Dumeril's boas, (exceptional parents) Joel Rosen, box #875, Baldwin, New York 11510-0597, 516-223-3172 (d) 516-541-0977 (h)

ROSY BOAS: 2.2 "Whitewater," 1.1 "Poway" - proven breeders, should be gravid at time of purchase, \$300/pair. '96 BAJA MOUNTAIN KINGSNAKES: 1.3 - \$150 each or \$500 for all. (714) 998-4388.

ROUGH-SCALED SAND BOAS - *Eryx conicus* and **DESERT SAND BOAS** - *Eryx miliaris*. Newborns due June through September. Young from different litters will be available. My breeding colony is represented by many different bloodlines. Contact Kelly Haller, 4236 SE 25th, Topeka, KS 66605. 913-234-3358.

NO PIKERS AT STRIKERS in 97: Look for Ghost and Snow Bulls, Cape Gophers, Outerbanks Kings, Brooks Kings, Ghost Corns, my Super-Okeetee Corns, and more. Some surplus adults also available including Carpets, Bulls, and *knoblochi*. Free price list: Howie, P.O. Box 3535, VABeach, VA 23454, (757) 426-7260

PUBLICATIONS

INTERNATIONAL HERPETOLOGICAL SYMPOSIUM video tapes available. Cutting edge information from this annual symposium. 51 tapes available from 1990 to 1995. Send SASE for flyer. Mark Silver Productions, P.O. Box 15731, Seattle, WA 98115-0231.

HERP CLASSIFIED. Monthly classified publication for reptiles, amphibians, food items, supplies, literature, more. Excellent information source, world-wide circulation. Subscription \$14.00. Free sample. G.V.S. 2379 Maggio Circle #C. Lodi, CA 95240. (209) 369-7737 MC/Visa.

HERP HYPE CLASSIFIED NEWSLETTER is published monthly. Looking to sell or buy a reptile or related item? Interested in placing an ad or event date? Subscriptions \$15.00 per year. For information, contact Herp Hype, P.O. Box 88, Campbell, Texas 75422 (903) 862-2291.

HERP BOOKS AND MAGAZINES. Huge selection

at excellent prices with great service. Call or write for a current stocklist. Pet shops may request a wholesale catalog. Zoo Book Sales, P.O. Box 405, Lanesboro, MN 55949 Phone: (507) 467-8734.

COLLARED LIZARDS make great pets. This book tells where to catch them, how to handle them and all other needed information. *Collared Lizards as Pets*, by John Seginski. \$11.95 postpaid. TJE Publications, Box 50141, Reno NV 89513.

NEW 1997 International Herp Importer's Guide. Start importing your own herps worldwide at below wholesale prices. This international directory includes exporter contacts in Madagascar, Peru, Indonesia, Thailand, Surinam, Guyana, Nicaragua, Zimbabwe, Germany, South Africa and many others! Import Boas, Pythons, Lizards, Turtles, Tortoises, Frogs and spiders directly from these exporter/breeders. Buy hard to find species, start your own business, improve and diversify your bloodlines and increase your collection. Fantastic information, and guaranteed the ultimate sourcebook. Not available from any other source. For your copy send \$40.00 (includes S&H) to: Crown Jewel Publishing Co., 3646 E. Ray Road, #B16-29, Phoenix, AZ 85044. Guaranteed delivery.

CANADIAN REPTILE MAGAZINE! "The OphidioFile", first and only publication of it's kind from Canada. Covers herpetology and herpetoculture. *Full Colour*, six issues per volume, \$23.75/vol., U.S. funds only from U.S., add \$10.00 all other foreign. \$7.00/sample copy. 100, 1039 - 17th Ave. SW. Suite 214, Calgary, Alberta, Canada, T2T OB2 or call (403) 229-0586.

SUPPLIES

FREE! DAVID BLAIR'S CRITTER CORNER CATALOG of the world's largest selection of quality reptile and amphibian supplies! Why order from a "Large Fruit", a "Shrub" or a "Legume Ranch" when you can deal directly with David Blair, a name you can trust. Choose from thousands of lighting, heating, housing, nutritional, disinfecting, books and medical products. Give us a try! You will be delighted with our friendly, courteous and knowledgeable sales staff. For free catalog, or to place an order, call toll free Monday-Friday, 9 am. to 5 pm. (800) 437-7688 or (760) 746-5422. MC/Visa/Discover accepted. David Blair's Critter Corner, 3410 De Lago Blvd., Suite A334, Escondido, CA 92029.

HELP your reptiles keep their red coloring by feeding Canthaxanthin. \$22.00/ 2oz. A little bit goes a long way. Call 1-800-942-3438 or write Avi-Sci., Inc. 4477 S. Williams Rd, St. Johns, MI 48879.

"BED-A-BEAST" NEW ENVIRONMENTALLY FRIENDLY REPTILE BEDDING. Ideal for chameleons, snakes, lizards, iguanas, amphibians, turtles and tarantulas. Ideal for egg incubation. Zoo tested and Approved. Made from All Natural Coconut Fiber. Sterile, pH neutral, safe if ingested, non abrasive to skin & eyes. Comes in highly compressed bricks. Soak each brick in 4 quarts hot water to yield 7-8 liter volume. Introductory offer, \$2.50/brick (fob). Cases of 8 or 24, discounts for larger volumes. Contact: Josh Nelson for more information. (401) 782-8747 tel/fax, email: RIWiggler@aol.com POB 94, W. Kingston, RI 02892.

EVENTS

MARK YOUR CALENDAR! The 1997 National Reptile Breeders' Expo is coming. The world's largest reptile and amphibian show will be held at the Radisson Twin Towers Hotel in Orlando, Florida on Saturday August 16th and Sunday August 17th. Come early and attend the Special benefit for the International Gecko Society on Friday night August 15th. The night will feature a series of talks on a variety of Gecko topics and all the proceeds of this event will benefit the IGS. Gecko night speakers will include; Wilhelm

Henkel, Yuri Kazeridn, Eddy Postma, Tim Tytle, Ron Tremper, and Bill Brant. There will also be a variety of lectures on various other species Saturday evening, the 16th of August. For more information please contact Wayne Hill at (941) 294-2235 or write The National Reptile Breeders Expo, PO Box 3277, Winter Haven, FL 33885.

PET MANIA! PET AND REPTILE EXPO. September 13th - 14th. Benton-Franklin Fairgrounds, Kennewick, Washington. Info and booth reservations call Larry Bright Phone/Fax: 509-375-0435 or 509-546-1311.

13TH ANNUAL MIDWESTERN HERPETOLOGICAL SYMPOSIUM, Oct. 17-19, 1997, hosted by the Minnesota Herpetological Society, Best Western Canterbury Inn, Shakopee, MN. Friday-vendor night, display of rare books and reptile oriented antiques, Saturday-lectures, Keynote speaker: Dr. Peter Pritchard, banquet and auction, Sunday - Veterinary workshop. Free shuttles for airport, Mall of America. Early registration \$48.00 until Sept. 1, 1997. Contact: The Minnesota Herpetological Society, Bell Museum of Natural History, 10 Church St. SE, Minneapolis, MN. 55455-0104. Voice Mail: (612) 624-7065

RODENTS, ETC.

THE GOURMET RODENT: Rats and mice-pinkies, fuzzies and adults. For info, contact: Bill Brant, 6115 S.W. 137th Ave., Archer, FL 32618. Phone (352) 495-9024. We now accept Visa and Mastercard.

SCALES & TAILS INTL. MICE, 30 per 1000, Rats sm: .75, lg 1.35. The best prices on reptiles, birds, mammals. (904) 253-6165, fax (904) 441-1857. 24 hour answering service. 1-800-955-8102.

HUMANELY KILLED, QUALITY FEEDER RODENTS- 100% SATISFACTION GUARANTEED! We feed high-quality diets and do not sell retired experimental animals. Vacuum-packing available. Competitive prices, quantity discounts. Visa/MC/Discover. **SOUTHWEST RODENTS**, 3144 East President St., Tucson, AZ 85714, (800) 366-8794, e-mail: swrodents@silkpence.com, WWW: http://silkpence.com/swrodents/. \$75 minimum order.

BAYOU RODENTS: Excellent quality feeder mice & rats for sale. Every size available. Pinks starting at \$20.00/ 100. Orders are shipped by overnight service Monday thru Thursday. We accept Visa, Mastercard, and Discover. For more info, contact Rhonda or Peggy at 1-800-722-6102.

INDIVIDUALLY PACKAGED MICE-CICLES™ & RAT-CICLES™ CRYOVAC® Vacuum Packs give you 1. No Refrigerator odors, the fresh smell is locked in. Even the fussiest snake will eat them. 2. Zero Chance of Freezer Burn and 3. An Incredible 2-3 year shelf life, compared to 2-3 months with Zip Lock Bags. ARF!, ARF!, ARF! If your mice & rats start barking at you, ask the breeder what they are feeding them. We start with Lab Chow base, guarantying 28 minerals, & add whole grain Oats, Corn, Milo & Sunflower Seeds. We deliver superior quality mice & rats at a very low price. Why risk Ticks, Mites, & Tape Worms, by feeding live. "Freezing kills all blood sucking parasites dead." "Deader is Better." Quantity Discounts, Pinks as low as 19 cents. Minimum 100 mice, 50 rats. Overnight delivery, same rate 48 states. Public Welcome. Ask about Monthly Budget Plan. Visa, Master Card, M.O., or Check by Fax/Phone. **FREE PRICE LIST.** "How to raise your own mice & rats" \$12.00. **CALL NOW.** Joe Brant 1-800-GET-RATS (800-438-7287) **MICE ON ICE™ ZOOLOGICAL PET FOODS, INC.**

THE MOUSE FACTORY, Superior quality frozen feeder mice for sale. We are now in our eighth year of production and supply of frozen feeder mice. Our

mice are frozen separately and vacuum-packed to greatly extend freezer life by reducing freezer burning and preserving vitamin and nutrient content. We feed our colony a nutritional balanced diet of mouse chow and four types of natural, whole grains and seeds. Prices: pinkies \$25.00/100, fuzzies \$30.00/100, weaned \$35.00/100. Quantity discounts available. Contact Ray Queen, P.O. Box 85, Alpine, TX 79831. (915) 837-7100.

SOUTH COAST FARMS. Live or frozen. MICE: Pinks \$.20/ Fuzzies \$.25/ Weaned \$.30/ Sm. Adults \$.35/ Lg. Adults \$.42. Farm direct, shipped to your door. Lab quality diet. \$100 minimum order. Visa/MC accepted. **SOUTH COAST FARMS** 2025 Harbison Cyn Rd., El Cajon, CA 92019 (619) 659-0428.

CRICKETS! CRICKETS! Size pinhead, 1/8, 1/4, 1/2, 3/4 adults. Live delivery price 9.00 M. up. Mealworms cupped, or bulk, buy direct from cricket farm. 1-800-654-3506.

Frozen Rats, Mice, Chicks & Guinea Pigs - from \$25.00 per 100. **LIVE CRICKETS** \$16.50 per thousand. MC, VISA, AMX & DISC. FOB: Perfect Pets, Inc., 23180 Sherwood, Belleville, MI 48111: Phone (313) 461-1362, Fax (313) 461-2858.

CHAMELEONS AND BIG BUGS. 4-horned, \$75; *C. montium*, \$35. Qty. Discounts - excellent quality. Alternate food source - Brazilian roach: can't climb glass, clean nutritious, eats grain and fruit. Start colony and maintain food source for years - economic. \$1/Adults, min. qty. 50; Great for breeding Dragons, Monitors, Chameleons and other large lizards. J&R Reptiles (425) 867-5503

HIGH QUALITY FROZEN FEEDERS - Over a decade of production and supply. Seven sizes of mice available. Prices start at \$25.00 per 100. All feeders separate, not frozen together. Raised on high quality diets, not dog food. Free price list. Kelly Haller, 4236 SE 25th, Topeka, KS 66605. 913-234-3358. Evenings and weekends.

HELP WANTED

EXOTIC OPPORTUNITY Associate wanted for progressive small animal hospital in Eastern Pennsylvania. This nine doctor, client oriented group offers an excellent opportunity for a veterinarian with general surgical and medical abilities who has a desire to develop a field of expertise. Experience in reptiles, birds and pocket pets preferred. Our hospital facilities include a clinical laboratory, ultrasound, endoscopes, Ellman surgery unit, operating microscope and more. Salary and bonuses commensurate with experience. Full benefits including 401K. Call (610) 865-2611 during the day (2-5 PM preferred). Ask for Dr. Geoffrey Wright or Dr. Robert Stewart or send resume to Wright Veterinary Medical Center, 3247 Wimmer Road, Bethlehem, PA 18017. Position available in 1998.

INTERESTED IN GAINING HANDS-ON EXPERIENCE helping a threatened species? Join our research and conservation project involving the loggerhead sea turtles! Assist biologists in collecting data on adult females, eggs and hatchlings on Wassaw National Wildlife Refuge, a series of pristine barrier islands off the coast of Georgia! Contact the Savannah Science Museum for more information. Caretta Research Project, 4405 Paulsen Street, Savannah, GA 31405

MISCELLANEOUS

ROGERS FREEZE-DRI TAXIDERMY. We specialize in reptiles, amphibians and invertebrates. Don't throw away your investment if fatality strikes. "Be Wise, Immortalize". (209) 754-3454. P.O. Box 606 Mountain Ranch, CA 95246 for information.

CANADIAN REPTILE & AMPHIBIAN STORE - in the Toronto area. 4,000 square feet of reptiles and supplies, including customized display habitats. Knowledgeable staff ready to answer your questions. Reptilia, 91 Fernstaff Ct. #8, Concord, Ontario, Canada, L4K 3L9 (905) 761-6223 or 1-888-REPTILIA (737-8154).

WANTED

DECEASED HERPS to be freeze-dried for biological study. Must be frozen and in excellent condition. \$Will pay\$. Call Sean (212) 343-1114.

WANTED: CALIFORNIA TIGER SALAMANDERS (*Ambystoma t. californiense*); legally held or acquired specimens - TOP DOLLAR PAID. Also wanted: *Aneides*, *Dicamptodon*, *Necturus*, *alabamensis* & *punctatus*, *Cryptobranchus*, *Bolitoglossa*, *Pseudoeurycea*. Erik Keyster (309) 925-3769.

BOOKS WANTED: *Keeping Reptiles and Amphibians as Pets*, by Chris Banks (1980) and *Encyclopedia of Australian Animals: Reptiles*, by Harold Ehman (1992). Terry Gentry 121 Westminster Dr., Mt. Laurel, NJ 08054 (609) 234-4918.

BUSINESS OPPORTUNITIES

MAKE YOUR HOBBY PAY: From the expert. "How to really raise mice and rats". Cages, feeding & watering. Sources of breeding stock and supplies. Sexing & colony management. Send \$12.00 to Joe Brant, Mice on Ice™, 2000 S.E. 43rd Terrace, Gainesville, FL 32641, or Visa/Master Card, 1-800-GET-RATS (1-800-438-7287)

BUSINESS OPPORTUNITY.... I can't attend every reptile show so here's a way for both you & I to make money. Sell **JURASSIC REPTILE SAND** for me. I supply the product (wholesale) and booth graphics, and you do the selling. Call Jerry at Salix Corporation (801) 531-8600.

ORGANIZATIONS

NATIONAL TURTLE & TORTOISE SOCIETY. The NTTS is dedicated to education, research, conservation, and captive propagation of turtles and tortoises. Our members are interested in captive breeding of many different species, including: Sulcates, Leopards, Reeves, Red-eared sliders, various box turtles, wood turtles, spotted, softshells, pancakes, Russians, and Egyptians—just to name a few of the species our members care for. The Carapace is our bi-monthly newsletter in which information about our organization and meetings is listed. Annual membership is \$18.00 for an individual, or \$20.00 for a family (U.S. Only). Foreign Memberships: Individual - \$28 U.S. annually, Family - \$30 U.S. annually. For more information write, National Turtle & Tortoise Society, P.O. Box 66935, Phoenix, AZ 85082-6935. Phone (602) 275-6887.

THE AMERICAN DENDROBATID GROUP. Interested in poison frogs (dendrobatids), mantellas, or Ateloid toads. Consider the ADG. Bi-monthly newsletter for \$15.00/calendar year. Back issues available 1992 -\$5; for 1993 and 1994 - \$10 per year, 1995 - \$12.50. Write Charles Powell, II, 2932 Sunburst Dr., San Jose, CA 95111-2264. Tel. (408) 363-0926.

THE INTERNATIONAL HYLID SOCIETY. A non-profit organization comprised of institutions and individuals from around the world who keep and study TREE FROGS. Members receive quarterly bulletins filled with articles, classified ads and full color photography. Membership fees: \$15.00 per year. Make checks to International Hylid Society and payable in US dollars. Send to: International Hylid Society 2607 Thomas Rd., Valparaiso, IN 46383. Phone: (219) 464-1922.

KENTUCKY REPTILE ZOO/Captive Born Venoms. We at the Kentucky Reptile Zoo are in need of donations of any amount by private individuals or by businesses. Being a institutional non-profit organization we receive no government funding and receive all money through gate receipts and donations. The donations will be used to expand the current educational exhibit along with funding for field research across the U.S. and in South America. Contact us at: 1275 Natural Bridge Road, Slade, Kentucky 40376, ph (606) 663-9160, fax (606) 663-6917, or e-mail kyreptil@pop.mis.net.

LAS VEGAS! Moving to the area or just coming to gamble. Visit the **SOUTHERN NEVADA HERPETOLOGICAL SOCIETY.** Monthly meeting with guest speaker and giant raffles. Meetings are held the first Friday of every month at 7:30pm. Membership includes a subscription to the SNHS monthly newsletter *The Rattler*. Dues are \$15.00 individual, \$20.00 family, \$30.00 business. Business members receive a free business card size ad in each issue of *The Rattler*. For more information call (702) 647-1652 or write SNHS, PO Box 4753, Las Vegas, NV, 89127.

The **INTERNATIONAL VENOMOUS SNAKE SOCIETY** is a one-of-a-kind publication recognized worldwide on the subject of venomology and venomous snakes of the world. Membership rates: \$10 a year, \$17.50 for Mexico and Canada, \$35 for all Foreign memberships. Publications printed 3X/year. PO Box 4498 Apache Junction, AZ 85278-4498.

SOUTHWESTERN HERPETOLOGISTS SOCIETY founded 1954. Monthly meetings in Los Angeles and Santa Barbara, California areas. Monthly newsletter, journal herpetology. Knowledgeable speakers, books, publications discounts. Individual membership \$20, family membership \$25 — foreign add \$10. For more information contact: SWHS, PO Box 7469, Van Nuys, CA 91409.

The **EAST TEXAS REGIONAL HERPETOLOGICAL SOCIETY**, a learning environment for hobbyists, amateur, and professional herpetologists. Meeting the second Saturday of every month at the University of Texas at Tyler, Science Bldg. For information, call (903) 675-3244 or e-mail xpython@cleaf.com

CENTRAL ILLINOIS HERPETOLOGICAL SOCIETY, promoting the appreciation and conservation of reptiles and amphibians since 1960. Monthly meetings, field trips, bi-monthly newsletter, annual show. \$12.50 Ind., \$15 Fam. P.O. Box 6413, Peoria, IL 61601-6413.

WESTERN AUSTRALIAN SOCIETY OF AMATEUR HERPETOLOGISTS, INC. Fighting for equal rights for all herps! WASAH's objective is the legal keeping of herptiles in WA. Annual membership includes *Herpetofauna* and 4 issues of the *WASAH Newsletter*. Overseas membership \$20 U.S./year. 69 Egina Street, Mount Hawthorn 6016, Australia.

Live in Southern California? If you do **JOIN THE SOUTHERN CALIFORNIA HERPETOLOGY ASSOCIATION (SCHA)** at their monthly meetings held on the second Monday of each month at 7:00 pm in Houghton Park, Long Beach, CA. SCHA is a non-profit, education and recreation club for persons with an interest in reptiles and amphibians. SCHA is dedicated to conservation and education in the field of herpetology, and is actively involved in public education through its many free shows and exhibits. For more information about membership, shows, or *Reptiles* (the SCHA's monthly newsletter) write to the SCHA, P.O. Box 90083, Long Beach, CA 90809-0083 or call Steve at (562) 498-3211.

AMERICAN TORTOISE RESCUE is a nonprofit corporation that disseminates information on turtle and tortoise general care, adoption updates, legislative battles, and health tips in their quarterly newsletter.

"Sex, Turtles, and Rock & Roll". Don't miss a single issue, send your check or money order today for \$15.00 to American Tortoise Rescue, 5757 Wilshire Blvd, Suite 655, Los Angeles, CA 90036-3686

GEORGIA HERPETOLOGICAL SOCIETY: Founded in 1968, and dedicated to education and conservation. Membership is \$12.00 for individuals, \$15.00 for family and \$100.00 for individual lifetime. Send request to, Georgia Herpetological Society, P.O. Box 464778, Lawrenceville, GA. 30246 ph (404) 653-9966. '97 Expo info: (770) 505-0547.

THE WESTERN NEW YORK HERPETOLOGICAL SOCIETY, Inc. (WNYHS) is dedicated to the study and discussion of all herp-related topics. Meetings are 7:30 pm the third Wednesday of every month at Medaille College in Buffalo, NY. For more information, contact Monica Boniface at (716) 446-9727

BULLETIN BOARDS

HERPETOLOGY NETWORK invites AFH members to participate in its international communication system for the study, propagation/conservation of herpetozoa. Herp-Net exchanges information/ideas among herpetoculturists, veterinarians, zoos, and others. Supports >2,000 members. Discussions on husbandry, medicine, captive requirements, reproduction, laws, more. Information, programs and photos are available. Herpetoculturists post CB stock lists - no charge! Herp-Net 24 hours/day via ANY computer: 215-464-3562 (300-2400 bps), 215-698-1905 (9600-28.8k). Set communication: 8 bits, No parity, 1 Stop bit. Non-profit project supported by private contributions. Questions? Mark Miller, P.O. Box 52261, Philadelphia, PA 19115-7261; Email mmiller@mail.tju.edu



THE EXACT PRESCRIPTION FOR HEALTHIER REPTILES AND AMPHIBIANS

RAINBOW MEALWORMS contain 12 of the 16 elements that are found in living tissue and rich in Vitamins A and B. Natural vitamin A is essential to your herpiles nutrition and growth. Vitamin B is required to maintain the nervous system. Each and every worm is fresh and lively. WE guarantee 10% more overcount per measure.

CRICKETS - WE CARRY ALL SIZES FOR YOUR PET FEEDING REQUIREMENTS
KEEPING YOUR PETS HEALTHY AND HAPPY IS OUR GOAL! - CALL FOR PRICES

PROMPT SHIPMENT ALL YEAR AROUND.

We Guarantee 10% or more overcount per measure

MEALWORM COUNT (per doz. unit)

	Medium Size Only
50	7.32
100	10.44
500	30.24

BULK WHOLESALE PRICES

Bulk Sizes: Mini, Small, Medium, Large, & Mixed			
2,000	9.75	10,000	30.50
3,000	12.00	20,000	56.50
5,000	16.25	40,000	101.00

California residents please add 8.25% State Sales Tax
Freight FOB Compton - Packaging & Handling Charge on Mealworms

ORDERS:
800-777-9676

P.O. Box 4525 / 126 E. Spruce St., Compton, CA 90220

INQUIRIES:
(310) 635-1494




WANTED!!

REPTILE EXPORTERS & BREEDERS

ALSO
EQUIPMENT, ACCESSORIES AND REPTILE BOOKS

"GRIFFON" is one of the largest reptile dealers in Japan. We import a wide range of reptiles and amphibians (common to rare) worldwide. If you have any captive-bred or native animals, please fax or mail your current availability list with dealer prices. We may be your best business partner for the future!



JAPAN'S BEST DEALER
GRIFFON
WHOLESALE ONLY

■ 4-153-2 Tobe-cho, Nishi-ku, Yokohama-shi, Kanagawa-ken 220 Japan TEL 81-45-263-1907 (Japanese only)

Export & Import office
TEL 81-45-262-4018
FAX 81-45-243-4440
81-45-243-4463

Fax or Mail Today!

Countries of particular interest include:
Africa, U.S.A., Madagascar, Middle & South America, Europe, Egypt, Vietnam, etc...
Everywhere in the world!!

■ Top Priority: Rare Geckos and Lizards

TIMBERLINE

MARION, ILLINOIS
"Growers of live pet foods"

Nutritionally Complete Selection

- **CRICKETS** 8 standard sizes. Custom sizes available
- **SUPERWORMS** Sm., Md., Lg.
- **GIANT MEALWORMS**
- **STANDARD MEALWORMS** Mini, Sm., Md., Lg.
- **WAX WORMS**
- **OTHER WORMS & ACCESSORIES**

UnMatched!

CUSTOMER SERVICE • PRODUCT QUALITY • SELECTION

GUARANTEED LIVE DELIVERY

Extended Customer Service Hours!

800-423-2248 • Fax (618) 997-4692 • www.timberlinefisheries.com



VIRTUAL RAIN

Adjustable Reptile Watering System

Ideal for:

Chameleons
Geckos
Anoles
Tropical Herps



◀ Refillable Reservoir

◀ Drip Speed Control
Drips for Hours



\$8.95 + \$2.50 S/H
SALES TAX APPLICABLE

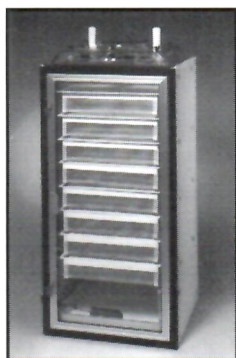
DEALER INQUIRIES
WELCOME

Distributed by:
Advanced Vivarium Systems, Inc.
10728 Prospect Avenue
Santee, CA 92071

For Information:
(619) 258-2629

LYON ELECTRIC COMPANY, INC.

WE ALSO CARRY A COMPLETE LINE OF REPTILE PRODUCTS INCLUDING SCALES, DIGITAL THERMOMETERS, CANDLERS, HEATING MATS, AND MUCH, MUCH MORE!



Profi-R

- ◆ Excellent For The Professional Herpetologist
- ◆ Easy To Clean ABS Walls
- ◆ Unobstructed View of Your Eggs
- ◆ Large Egg Capacity
- ◆ Backup Over Temperature Control



RL-1

- ◆ 40-45 Python Egg Capacity
- ◆ Visibility! Visibility! Visibility!
- ◆ Accurate Solid State Temperature Control
- ◆ Easy Access Sliding Incubator Trays
- ◆ Fan Forced Air Circulation
- ◆ Ideal Adjustable Air Intake System



TX-R

- ◆ Excellent Visibility
- ◆ Easy To Use Solid State Temperature
- ◆ Just add Water To Control Humidity
- ◆ Includes Easy To Read Lab Thermometer
- ◆ Ideal For Reptile Eggs Including Chameleons, Snakes, and Turtles
- ◆ Fan Forced Air Circulation
- ◆ Optional Vermiculite



Write or call us for a free Reptile Product Catalog or Bird Product Catalog!
2765 Main Street, Chula Vista, CA 91911, U.S.A. Telephone: (619) 585-9900
Email: lyonelect@aol.com Fax (619) 420-1426

New
Location!

MIDWEST CUSTOM PRODUCTS, INC.

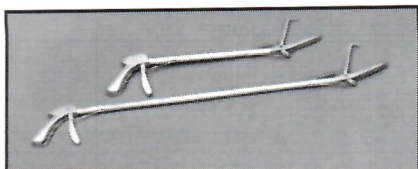
PROFESSIONAL ANIMAL HANDLING EQUIPMENT

14505 South Harris • Greenwood, MO 64034

Phone: (816) 537-4444 • Fax: (816) 537-4226

worldwide web: <http://www.tongs.com> • email: tongs@micro.comNow Open
Primate Breeding
Facility!

ALL NEW! NOW SELLING

Lighting, Thermostats, Vitamins, Books, Reptile-CD's, Video's and more products from
ZOO-MED/Energy Savers Unlimited/Rep-Cal/Advanced Vivarium Systems.

THE STANDARD TONG OUR MOST POPULAR SELLER

- Hand contoured, pistol grip • Elevated cast aluminum jaw

- Semi-internal stainless steel cable

Lifetime warranty on all tongs

AG-T	Animal Grabber 28" or 38"	\$80.00
SM-T	Cage 25" Tong	\$55.00
STD-T	Standard 40" Tong	\$55.00
XL-T 52	Extra Long Tong 52"	\$70.00
CL-T	Collapsible Tong	\$70.00
CL-HK	Collapsible Hook	\$38.00
HDCL-HK	Heavy Duty Collapsible Hook	\$45.00
STD-HK	Standard Hook	\$28.00
SM-HK	Small Hook 16"-24"	\$17.00
PY-HK	Python Hook	\$60.00

P-HK	Pocket Hook Size adj. 6"-25"	\$15.00
PS-6	Probe Set of 6, size range from .020-.187 (Carrying case & Lubricant included)	\$48.00
PS-3	Probe Set of 3, Sizes range from .020, .035, .062	\$38.00
PS-B-6	Ball Tipped Probes 6 Piece Set	\$48.00
P-P	Pinkie Press (Stainless steel precision feeding instrument) W/Extra Barrel	\$80.00
EX-K	"Extractor" Snake Bite Kit	\$15.00

TWEEZERS

TW-R-8	8" RUBBER COATED	\$15.00	HM-8	8" HEMOSTAT	\$12.00
TW-R-12	12" RUBBER COATED	\$20.00	HM-12	12" HEMOSTAT	\$18.00
TW-8	8" TWEEZER	\$10.00	HM-16	16" HEMOSTAT	\$22.00
TW-12	12" TWEEZER	\$16.00	HM-18	18" HEMOSTAT	\$28.00
TW-15	15" TWEEZER	\$20.00	HM-24	24" HEMOSTAT	\$35.00
TW-18	18" TWEEZER	\$25.00			
TW-24	24" TWEEZER	\$30.00			

HEMOSTATS

All of our products are manufactured of the highest quality materials and designed with the safety and security of both the handler and the specimen in mind.

CALL NOW!! Our products are in stock and ready to ship the day you order.

Phone: (816) 537-4444 • Fax: (816) 537-4226

Free Shipping with \$25 Minimum Order in The Continental United States
International Shipping Call For Price • Visa / MC Accepted US Only

YOU'RE AD COULD BE HERE!

To place an ad in The Vivarium call our
office at 760.747.4948



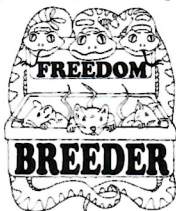
Freedom Breeder™

Mouse, Rat & New Reptile Breeding Racks

Racks are: Modular, Steel-Constructed - No Warping, Powder Coated, Interchangeable, with Easy-Glide, Self-Supporting, Durable Plastic Trays

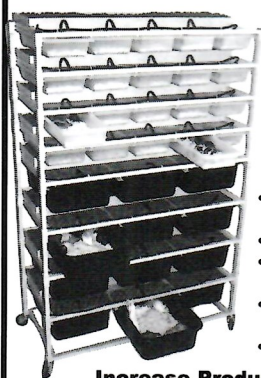
Rodent Features

- Automatic Water - No More Water Bottles to Fill!
- Large Food Hoppers
- Large Enough for 1M to 4F Rats or 1M to 6F Mice
- Fast Cleaning with Hands Free For Easy Access to Rodents
- NEW Drop Out Trays



Rodent Features

- GRATED TOP Means Total Air Circulation: No More Over-Heating, Condensation, or Respiratory Problems - Allows Ambient Temp. with Gradient
- Moveable Heat Panels
- Easy to Eliminate Mites!



Increase Production

38 Beta Ct. A-3, San Ramon CA 94583 • USA

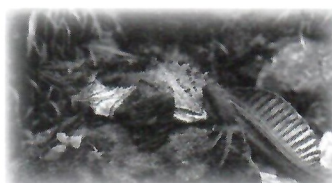
Time & Space Saver

Call / Write Now For Free Brochure Ph: (510) 838-2331 Fax: (510) 838-2524

BUSHMASTER REPTILES INC.

The finest Quality Imported and Captive Bred Reptiles

- Boelens Pythons • Timor Pythons • Turtles
- Irian Carpet Pythons • Chondros • Geckos
- Savu Pythons • Irian Blue Tongue Skinks
- Frilled Dragons • Tortoises • More!



Call or Fax for current Inventory.
Wholesale or Exotic Purchases Only Please.
Bushmaster Reptiles Inc. Is a Direct
Importer, Breeder and Broker of many High
Quality Rare and Hard to Find Reptiles.

Tel. (303) 530-2252 Fax (303) 530-2233

Bushmaster Reptiles Inc., P.O. Box 19096, Boulder, CO. 80308

We sell & buy the
largest selection of
reptiles & amphibians
in the WORLD !!!



We export
worldwide !!!
Call, write
or fax for
a current
pricelist.

GLADES HERP, INC

P.O. Box 50911
Fort Meyers, Florida
33905 U.S.A.
PHONE: 941-693-1077
FAX: 941-693-1901

M&S Reptilien



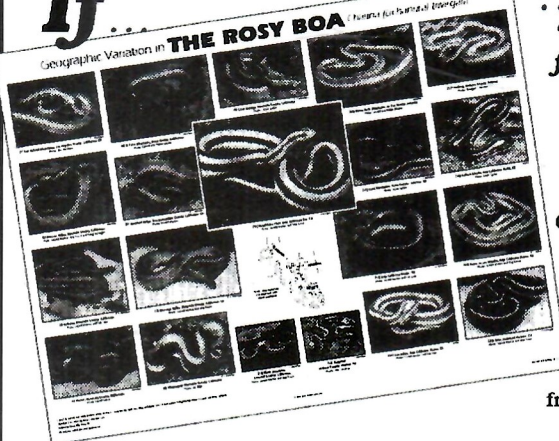
Reptiles *only captive born!*
Amphibians
Tarantulas - over 50 species
Food/Livefood
Supplies - all you need
Literature - over 150 titles
Your competent partner!
Import - Export

Vockenhauser Str. 16 - 18
78048 Villingen
Germany
Tel. (int) 49-7721/54046
Fax (int) 49-7721/54047

Public send \$6.00 for Catalogue
Dealer Inquiries Welcome

If...

Geographic Variation in THE ROSY BOA



... you don't know your
"San Gabriel" rosy boa
from your "Dome Rock"
rosy boa, Broda-Merker

Enterprises has just the
answer for you. We are
offering for sale a
new poster entitled
**Geographic Variation in
THE ROSY BOA.**

This poster represents the
first in our 200 series,
with a new and improved
format. Twenty different
forms of the rosy boa
from California, Arizona and
Mexico are represented.

This poster is \$12.95, postage paid. To
commemorate the release of this poster, a special
LIMITED edition has been printed for sale. The
LIMITED poster has been printed on a heavier
stock (suitable for framing) and has been signed
and numbered (a total of only 100 have been
printed). The cost of the **LIMITED** rosy boa poster
is \$25.95 postage-paid.

In addition, we are still offering for sale our
three other high-quality snake posters: **Snakes
of the Western United States** (second edition
with up-dated Latin names), **Milk Snakes of
North America** (second edition), and
**Geographic Variation in the Gray-banded
Kingsnake**. All three posters feature twenty
snakes in full color (many of which are rarely
photographed). These posters are \$9.95 each (or
any two for \$16.95) POSTAGE-PAID.

SPECIAL

All four posters (including the new rosy boa poster)
can be purchased for a one-time price of \$29.95 post-
age-paid. This does not include the **LIMITED** edi-
tion. For more information, please contact Broda-
Merker Enterprises, P.O. Box 51163, Pacific Grove,
California 93950. To purchase any of the posters
described herein, please send a check or money
order to:

Broda-Merker Enterprises
P.O. Box 51163
Pacific Grove, California 93950

If you are using a personal check, please allow five
to six weeks for delivery, to allow time for the check
to clear. Posters ordered via money orders will take
only three to five weeks for delivery. Those making
orders outside of the United States must make spe-
cial arrangements by correspondence to determine
shipping costs.



109 West Cherry Hill Road • Reisterstown, MD 21136

Phone: 410/ 526-4184

Fax: 410/ 526-8330

1000's of Discount Books and
Related Herp Supplies.

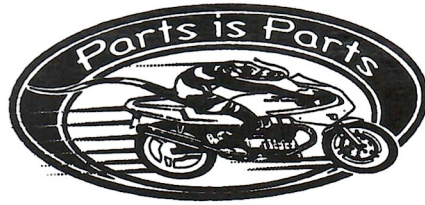
Send legal size S.A.S.E. for a Free catalog.
Dealer Inquires Welcome



<http://www.pythons.com/mrf/>



Captive Bred Baldies
From Bearded Dragons to Indian Pythons



PO Box 1352 Brodheadsville,
PA 18322-1352
717 992 9043 FAX 717 992 9247

9-5, Monday - Friday
Catalog Available

Sticky Tongue Farms™
Miner-All™

Calcium & Mineral Supplements For Reptiles and Amphibians
HAVE YOU TRIED THIS STUFF YET?

If not, ask someone who has!!



Ask Allen Repashy, world
class breeder of exotic lizards!

"The difference is amazing! Miner-All
is the only mineral supplement I use!"

Facts!

Why is Miner-All better?

- Miner-All I with vit. D-3 for indoor reptile and amphibian use.
- Miner-All O without vit. D-3 for outdoor reptiles and amphibians.
- *Is a phosphorous free, human-grade calcium supplement.
- *The only product scientifically balanced with over 50 vital minerals and trace-minerals found in skin, bones, and muscles of wild herps.
- *Formulated to stick better to insects than any other product!
- *NO oyster shell product containing pollutants or dangerous metals.
- *There are no vitamins in Miner-All (except D-3 in Miner-All I.) Minerals and vitamins, when combined, degrade each other.
- *Used and recommended by top breeders, Zoos, and Veterinarians!

Check your local pet store, or call

Ph.909-672-3876 Fax 909-301-1996 Dealer inquiries accepted!!

Developed out of necessity, tested on animals and in laboratories!

stckyfrm@pe.net or <http://www.biohaven.com/bus/stf>

26900 Newport Rd #121-141, Menifee CA, 92584

Ask Bob Mailloux, owner
of Sandfire Dragon Ranch!

"I have been using Miner-All on
my lizards and frogs for about
two years now, indoors and
outdoors with excellent results!"



PET-TECH
Products



**You will never have to
touch another cricket again!**

**BUBBLER
BOWL™**



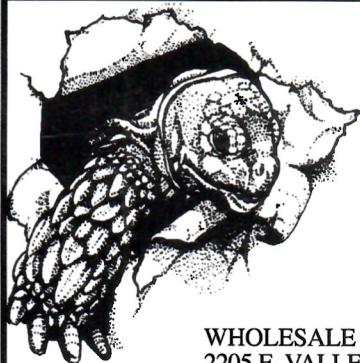
**Great for chameleons, geckos,
anoles, and other tropical or
forest dwelling lizards.**

Plus these great products;

- *Habi-Scape™ Rock Bowls
- *Habi-Scape™ Corner Bowls
- *Aquatic Landings™
- *Habi-Scape™ Tropical Plants
- *Pacific Driftwood
- *Reptile Drip Watering Systems
- *Mini Drippers

**Look for PET-TECH PRODUCTS at
a pet store near you.**

P.O. BOX 801671
SANTA CLARITA, CA 91380-1671
818-781-3892 *818-781-3926 FAX



REPTILE HAVEN

1,000's IN STOCK
Captive-bred & Imported:

- Boas & Pythons
- Turtles & Tortoises
- Lizards
- Frogs

WHOLESALE • RETAIL • BUY • SELL • TRADE
2205 E. VALLEY PKWY, ESCONDIDO, CA 92027
Send S.A.S.E. for Price List (Wholesale or Retail)

TEL# (760) 741-0127

FAX# (760) 489-6778

INTERNATIONAL REPTILE BREEDERS ASSOCIATION

Presents

THE LARGEST REPTILE SHOW ON THE WEST COAST

July 19-20, 1997

Plaza Hall,
San Diego Concourse
San Diego, CA 92101

August 2-3, 1997

Mesa Community and
Conference Center
Mesa, AZ 85211-1466

October 4-5, 1997

Plaza Hall,
San Diego Concourse
San Diego, CA 92101

November 22-23, 1997

Mesa Community and
Conference Center
Mesa, AZ 85211-1466

Admission:

\$7.50 Adults
(2 day pass \$12.00)
\$4.50 Under 10 yrs.
(2 day pass \$7.00)

MEET THE NATION'S TOP HERPETOCULTURISTS

- Hundreds of exhibitors
featuring 1,000's of captive bred
reptiles and amphibians
- Educational workshops
and lectures
- The latest in reptile
related products



<http://www.irba.com>

See us on the
World Wide Web

FOR BOOTH INFO CONTACT IRBA 1-800-497-3550

PO BOX 85152-279 S.D. CA 92186 FAX (619) 263-6898

Albino Boa Constrictors & Albino Ball Pythons

& other fine investment — quality reptiles
Over 25 years experience



P.O. Box 123, Catharpin, VA 22018

[703] 754 4624 phone/fax

(before 10pm EST)

REPTILE EXPO Texas

Comfort Inn	May	17-18
1601 E. Division	July	19-20
at Collins	Sat.	9-5
Arlington, TX	Sun.	10-5

**Nationally known breeders
and suppliers will be
represented.**

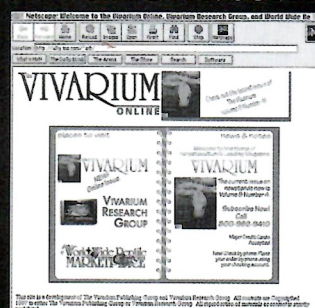
You won't want to miss this show
if you are looking for

**Quality
Captive Bred
Animals**

3450 SQ. FT. SHOW!

For additional information call
(903) 862-2291

www.vivarium.com



Home of The Vivarium Online

MADAGASCAR REPTILE & PHOTO SAFARI



NOV. 4 - 21 (or 28), 1997

*We'll take you on the most herp-intensive
& fun trip-of-a-lifetime imaginable!*



**Bill & Kathy
Love**

PO Box 643
Alva, Florida
33920 U.S.A.

Tel 941-728-2390 Fax 941-728-3276

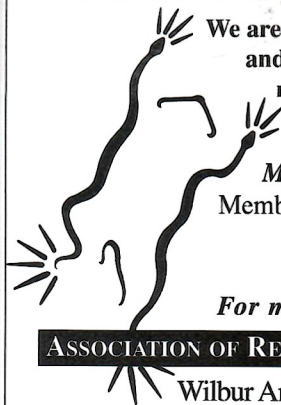
INTERNET www.cyberstreet.com/loveherp
E-Mail bllove@cyberstreet.com

Advertiser's Index

A.R.A.V.	67
Advanced Vivarium Systems	43
Bayou Rodents	13
Bean Farm, The	15
Bibliomania	22
Black Jungle Terrarium Supply	70
Blue Chameleon Ventures	66
Broda-Merker Enterprises	64
Bush Herpetological Supply	5
Bushmaster Reptiles	64
Captive Bred Wildlife Foundation	15
Carolina Mouse Farm	9
Chameleon Information Network	69
Creative Aquatics	19
Custom Cages	19
Dragon's Den Herpetoculture	31
Drosophila	9
Dunthorpe Press	22
Ecologic Technologies	68
Energy Savers	79
Freedom Breeder	63
G&M Reptiles, Inc.	70
Glades Herp, Inc.	64
Griffon	61
Helix Controls	76
IRBA	66
J. C. Reptiles	67
King Mike	15
Lyon Electric Co.	62
M&S Reptilian	64
Mardel Laboratories, Inc.	76
Maryland Herp Society	12
Midwest Custom Products	63
Nekton	73
Oceanic Systems, Inc.	31
Parts is Parts	65
Pet-Tech Products	65
Rainbow Mealworms & Crickets	61
Rep-Cal	2
Reptile Haven	66
Reptile Specialties	78
Sandfire Dragon Ranch	78
Scope Co., Ltd.	9
Southern Nevada Herp Society	67
Sticky Tongue Farms	65
T-Rex	25
Tetra-Terra fauna	80
Texas Reptile Expo	66
Timberline	62
Top Hat Cricket Farm	9
Virtual Rain	62
ZooMed	3



ASSOCIATION OF REPTILIAN AND AMPHIBIAN VETERINARIANS



We are a non-profit international organization of veterinarians and herpetologists founded in 1991. Our goal is to improve reptilian and amphibian veterinary care and husbandry through education, exchange of ideas and research.

Membership Includes: The quarterly Bulletin of the ARAV, Membership Directory and the Annual Conference Proceedings

Dues: North America - \$55 International - \$70

For membership information write to:

ASSOCIATION OF REPTILIAN AND AMPHIBIAN VETERINARIANS (ARAV)

Wilbur Amand, VMD, P.O. Box 605, Chester Heights, PA 19017

SYMPOSIUM
on Captive Breeding & Husbandry
of Reptiles & Amphibians
February 13 - 15, 1998

Call for Papers

Submission due by
September 15, 1997

A Three Day Event

February 13-15, 1998

Valentine's and
President's Day Weekend

To be Held at the

Boardwalk Holiday Inn

3750 S. Las Vegas Blvd.,
Las Vegas, Nevada 89109

Across the street from

MGM Grand Between
Monte Carlo and
Caesar's Palace

Only \$120⁰⁰

*80-Symposium • *20-PrePublication
of the Proceedings • *20-Banquet

Sponsored by:

So. Nev. Herp Society

P.O. Box 4753,

Las Vegas, NV 89127-0753

For More Information, Call:

Terry Christopher 702.647.1652
Ken Foosse 702.631.7387

Boas

Pythons



J.C. Reptiles

SPECIALIZING IN INDO-AUSTRALIAN PYTHONS,
CORALLUS & CANDOIA

PHONE / FAX
954-722-8758

JERRY CONWAY
7154 N. UNIV. DR. #102
TAMARAC, FL 33321

Continued from page 8

an animal dealer in Madagascar, informed us that even sick Parson's will become more alert and feed when presented with small birds. Commercially-raised zebra finches and quail such as coturnix quail or button quail for smaller Parson's may prove to be a useful food for this species. Possibly these large chameleons can be encouraged to eat pre-killed birds offered on tongs. Large Meller's chameleons (*C. melleri*) will also readily consume small birds. A male that we kept in an outdoor enclosure in California struck at a mockingbird through the welded wire cage, successfully killed it but was unable to pull it through the mesh.

Large chameleons also readily tend to eat other lizards. Our female Meller's repeatedly struck at and tried to eat young adult four-horned chameleons. In Madagascar we observed an Oustalet's chameleon (*C. oustaleti*) that had just captured a subadult panther chameleon (*C. pardalis*). It proceeded to swallow the prey head first. Panther chameleons will readily feed on small geckos if given the opportunity, as well as green anoles. Pink mice may be a suitable alternative to lizards. Roger Klingenberg (personal communication) successfully kept a female panther chameleon for four and a half years. It was given minimal supplementation but was hand-fed a pink mouse every two weeks, in addition to receiving a diet of crickets.

What role can vertebrate prey play in maintaining large chameleon species long term and what feeding schedule is required to supply needed vitamins and minerals? These are questions that we will hopefully be able to answer in the not too distant future. 

Continued from page 50

(*Lampropeltis triangulum taylori*) and some varieties of the common kingsnake (*Lampropeltis getula*). The breeding sequence is similar to that described elsewhere (Murphy et al., 1978; Gillingham, 1975).

In our collection, we usually have the females bred at least three times. We have had the Mexican milk snake copulate as many as nine times over a 25 day period. The females always have a pre-egg laying shed from seven (the usual) to ten days prior to egg deposition. After the shed, a plastic container, with an access hole at least twice the diameter of the snake, is placed in her cage. Inside this plastic container, we place damp sphagnum moss.

We have never had a female lay her eggs in anything other than her nest box.

We have had as few as two eggs from one female. In contrast, we have had as many as 13 eggs from another female. Applegate (1992) lists a similar range in clutch size for Mexican milk snakes.

Mexican milk snakes are also one of the easiest snakes to get to double or perhaps even triple clutch (Mackin, personal communication). We have had several females do this on three occasions. It is imperative that the female is in top condition. Right after her first clutch, the snake is free-fed as much as she can eat. Within three weeks a second breeding takes place, if it is going to happen. In our collection, we have never had a female double clutch if she undergoes a post-egg deposition shed first. Eggs in the second clutch are often fewer and smaller in size.

Egg incubation and hatching - Our milk snake eggs are incubated at 82° F (28°C) for approximately 60 days before they start to pip. The babies are fairly large, one-quarter ounce (seven g) on average, big enough to accept pink mice as their first meal.

If you desire a hardy, extremely attractive, tricolored snake, the Mexican milk snake, *Lampropeltis triangulum annulata*, is the perfect candidate. These snakes feed very well in captivity, are fairly low maintenance, and are propagated easily under captive conditions. We have produced numbers of these snakes over the years with minimal efforts. This is in contrast with some of our more difficult colubrids, the Sonoran mountain kingsnake (*Lampropeltis pyromelana*), the gray-banded kingsnake (*L. alterna*), and the green rat snake (*Senticolis triaspis*).

We would like to thank the following people who generously shared their talents with the various aspects of the article, from the collecting of information, to the photography, to the writing of this paper. These people include Doug Brown, Heino Kemnitz, Ronald Garthwaite, and Jean Allured.

About the author: *Thurgess Cranston and his wife, Eunice, have B.S. degrees in Zoology from the University of California at Davis, where they met over preserved specimens in a "cold-blooded vertebrates" class. Thurgess received a Master's Degree in Biology from UC Riverside. They maintain colubrid snakes and several species of lizards and amphibians.*

Literature Cited

Applegate, R. 1993. *The General Care and Maintenance of Milk Snakes*. Advanced Vivarium Systems. Lakeside, CA.

Conant, R. 1991. *Reptiles and Amphibians of Eastern/Central North America*. Houghton Mifflin Company, Boston.

Cranston, T. 1994. Notes on the natural history and husbandry of the Sonoran mountain kingsnake. *The Vivarium* 5(3):13-17.

Fogel, D. 1993. Heating herps in the 1990's. *The Vivarium* 4(6):8-11.

Gillingham, J. C., Carpenter, C. C., Brecke, B. J. and Murphy, J. B. 1977. Courtship and copulatory behavior of the Mexican milksnake *Lampropeltis triangulum sinaloae* (Colubridae). *Southwestern Naturalist* 22:187-194.

Mara, W. 1994. *Milk Snakes*. T.F.H. Publications, Inc. Neptune City, NJ.

Mattison, C. 1991. *A-Z of Snake Keeping*. Sterling Publishing Co., Inc. New York.

Merker, G. and Mackin, R. 1988. Herpatat® modular cages: innovative snake housing. Symposium Proceedings on Captive Propagation and Husbandry in Reptiles and Amphibians. Ralph Gowen (ed). *N. Cal. Herp. Soc.* pp 137-145.

Murphy, J. B., Tryon, B. W., and Becke, B. J. 1978. An inventory of reproduction and social behavior in captive gray-banded kingsnakes (*Lampropeltis mexicana alterna*), Brown. *Herpetologica* 34(1):84-93.

Tennant, A. 1984. *The Snakes of Texas*. Texas Monthly Press. Austin, TX.

Williams, K. L. 1988. *Systematics and Natural History of the American Milk Snake, Lampropeltis triangulum*, revised edition. Milwaukee Public Museum. Milwaukee, WI.





ECOLOGIC TECHNOLOGIES
P.O. Box 1038
Pasadena, MD 21122-0005
(410) 255-8486 Fax (410) 255-4474

MISTING SYSTEM KITS

Easily installed without the aid of a contractor and at a fraction of the cost.

MIST I - TANK OR AN ENTIRE ROOM

1 Year Manufacturer's Warranty

Continued from page 37

Anthony, Patrick Couper, Genene Dransfield, Kon Hepper, Tabitha O'Shea, Steven Peck, Karen Porter and Derek Rowe. I would also like to thank Queensland National Parks and Wildlife Service for their help and cooperation with permits of various types.

About the author - Rob Porter earned a Masters degree in zoology, specializing in small lizard ecology. He is Manager of the Australian Reptile Park, P.O. Box 192, Gosford, New South Wales 2250, Australia. He can also be reached via email: porterkr@ozemail.com.au

Literature Cited

Anthony, M. 1993. Discovery and hatching of the eggs of the northern leaf-tailed gecko *Phyllurus cornutus*. *Chondro (Newsletter of the Cape York Herpetological Society)* 1:40-41.

Arnold, E. N. 1986. Mite pockets of lizards, a possible means of reducing damage by ectoparasites. *Biol. J. Linn. Soc.* 29:1-21.

Bauer, A. M. 1990. Phylogenetic systematics and biogeography of the Carphodactylini (Reptilia:Gekkonidae). *Bonner Zoologische Monographien* 30:1-127.

Cogger, H. G. 1992. Reptiles and Amphibians of Australia. 5th Edition. Reed, Sydney.

Cogger, H. G., Cameron, E. E., Sadlier, R. A. and Eggler, P. 1993. The Action Plan for Australian Reptiles. *Australian Nature Conservation Agency Endangered Species Program Project Number 124*.

Couper, P. J., Covacevich, J. A. and Moritz, C. 1993. A review of the leaf-tailed geckos endemic to eastern Australia: A new genus, four new species and other new data. *Mem. Queensland Mus.* 34(1):95-124.

Couper, P. J. and Gregson, R. A. M. 1994. Redescription of *Nephurus asper* Gunther, and description of *N. amya* sp. nov. and *N. sheai* sp. nov. *Mem. Queensland Mus.* 37(1):67-81.

Covacevich, J. A. 1975. A review of the genus *Phyllurus* (Lacertilia:Gekkonidae). *Mem. Queensland Mus.* 17(2):293-303.

Doughty, P. and Shine, R. 1995. Life in two dimensions: Natural history of the southern leaf-tailed gecko, *Phyllurus platurus*. *Herpetologica* 51(2):193-201.

Ehmann, H. 1992. *Encyclopedia of Australian Animals: Reptiles*. Angus and Robertson, Sydney.

Green, D. 1973. Observations on the southern leaf-tailed gecko *Phyllurus platurus*

(Shaw). *Herpetofauna* 6:21-24.

Greer, A. E. 1989. *The Biology and Evolution of Australian Lizards*. Surrey Beatty, Sydney.

Kluge, A. G. 1967. Systematics, phylogeny and zoogeography of the lizard genus *Diplodactylus* Gray (Gekkonidae). *Aust. J. Zool.* 15:1007-1108.

Lethbridge, P. J., Hawkes, T. A., Anthony, M. and McGregor, M. 1994. New data on *Saltuarius occultus*, a recently described, poorly known leaf-tailed gecko. *Mem. Queensland Mus.* 37(1):194.

Loveridge, A. 1934. *Australian reptiles in the Museum of Comparative Zoology*, Cambridge, Massachusetts. *Bull. Mus. Comp. Zool.* 77(6):243-383.

Mebs, D. 1973. Drohreaktionen beim Blattschwanzgecko, *Phyllurus platurus*. *Salamandra* 9(2):71-74.

Wilson, S. K. and Knowles, D. G. 1988. *Australia's Reptiles: A Photographic Reference to the Terrestrial Reptiles of Australia*. Collins, Sydney.

Continued from page 55

of ten or more subcaudals, and females probe three to five subcaudals.

Prior to breeding, rosy boas should be taken off food and brumated at 55-60° F (12.7-15.5°C) for two to three months. After hibernation, warm the snakes and feed them, especially the females, heavily. After two weeks, introduce the male to the female. Many breeders choose to leave the male with the female for a period of several weeks.

Gestation ranges from 3.5 to six months. Females usually have a pre-parturition shed a week or two before birth.

Rosy boas, like all New World boas, give birth to fully formed young. Litters range from two to 15 young. Rosy boas typically produce only one litter in a breeding season.

House the neonates individually or in groups. Provide the same environment as provided for the adults (smaller enclosures of course, are used). Some individuals may be difficult to feed, and may need to be hibernated throughout the winter to stimulate their appetite, but this is uncommon. The vast majority of rosy boa hatchlings will eventually accept a domestic pinky mouse as their first meal. The ones that do not may be tempted by a lizard or wild-mouse-scented pinky.

Petra Spiess will cover other popular Arizona herps — the western green ratsnake (*Senticolis triaspis intermedia*), banded gecko (*Coleonyx variegatus*) and gila monster (*Heloderma suspectum*) — as well as Arizona herp-related laws in the next issue.

About the author: Petra Spiess is a Colorado-based herpetoculturist who is always happy to discuss the captive care and breeding of reptiles. Her email address is dspiess@frii.com.

Literature Cited

Spiteri, D. G. 1993. The current taxonomy and captive breeding of the rosy boa (*Lichanura trivigata*). *The Vivarium*. 5(3):18-19.

Stebbins, R. C. 1985. *Western Reptiles and Amphibians*. Houghton Mifflin Company, New York, NY.

Witwer, M. 1996. Rosy boas. *Reptile and Amphibian Magazine*. Nov/Dec:58-69.

NEW!! FEATURE LENGTH VIDEO FROM THE CHAMELEON INFORMATION NETWORK



MADAGASCAR: A Land Like No Other

Travel through the eye of the camera by foot, air, land and sea on a **field expedition** to some of the **last remnants of rainforest** on **Madagascar** and five of her offshore islands. See the spectacular panoramic beauty of "nature's living laboratory of evolution" with **chameleons (including 18 color forms of Panthers), frogs, lizards, snakes, geckos, lemurs, mammals, insects, and plants found nowhere else on earth!** (VHS - Approx. 110 minutes)

\$24.95

plus \$3.00 S&H U.S.; \$8.00 foreign. CA add 7.75% sales tax. Send payment to CIN.

13419 Appalachian Way, San Diego, CA 92129 or Call (619) 484-2669 for VISA or MasterCard

Upcoming Events

July 19-20: The International Reptile Breeders Convention will be held at the San Diego Community Concourse, San Diego CA. For info call Ray Busby at (619) 263-6898.

July 19-20: Texas Reptile Expo will be held at the Comfort Inn in Arlington, TX. Sat 9-5, Sun 10-5. Adults \$5, Children \$1. For info call: (903) 862-2291.

July 26-27: The National Reptile Breeders Trade Association Show will be held at the Radisson Hotel Philadelphia Northeast, Trevose, PA. For info call (316) 325-3096.

July 26: All Maryland Reptile Shows to be held at Havre de Grace Community Center, 100 Lagaret Lane, Havre de Grace, MD. 9am to 4pm. For info call (614) 457-4433.

August 2-10: The Third World Congress on Herpetology will meet in Prague, Czech Rep. Zbynek Rocek, Paleontology, Academy of Sciences Rozvojova 135, 16500 Prague 6-Suchdol, Czech Republic 422-24311421, fax: 42224311578, rocek@gli.cas.cz

August 2-3: The International Reptile Breeders Convention will be held at the Community Conference Center, Mesa AZ. For info call Ray Busby at (619) 263-6898.

August 9-10: Reptile Expo will be held at the Portland Expo Center, Portland, CA. For info contact: (707) 578-3976.

August 16-17: 1997 National Reptile Breeder's Expo will be held at the Radisson Twin Towers Hotel, Orlando Florida. For info call Wayne Hill (941)2942235.

August 23: The New York Herpetological Expo will be held at the LeMoyne Manor Hotel in Liverpool (Syracuse) NY. For info call Bob Cunningham at (315) 446-9292.

August 23: The New England Reptile Expo will be held at the Talent Agricultural Center, Vernon, CT. For info contact Steve Baker (860) 644-2367 or email: crwinc@aol.com

August 23: All Maryland Reptile Shows to be held at Havre de Grace Community Center, 100 Lagaret Lane, Havre de Grace, MD. 9am to 4pm. For info call (614) 457-4433.

August 24: The NY Metro Reptile Expo. Crowne Plaza Hotel in White Plains, NY (1/2 hour north of NY City). Hours are from 9am to 4pm, and admission is \$6/adults, \$3/children 5012. Under 5 is free.

August 30: The Spring Eastern Herpetological Expo will be held at the Sunnybrook Ballroom, Pottstown, PA. For info call (215) 257-6088.

August 30: Georgia Herpetological Society's Atlanta Reptile & Amphibian Breeder's Expo will be held at the Cobb Galleria Center, Atlanta, GA. 10 am - 6 pm. For info write to GHS, P.O. Box 464778, Lawrenceville, GA 30246.

August 30 - September 1: Reptile & Amphibian Show to be held at the Oregon Museum of Science & Industry (OMSI). 9:30 am - 7:00 pm. For more information call: Raylea Pickett, (503) 797-4677.

August 30: Atlanta Reptile and Amphibian Breeders Expo. Cobb Galleria Center. Sponsored by the Georgia Herpetological Society. Vendor info: David Bowman (770) 505-0547.

September 5-7: East Texas Herpetological Society's 7th Annual Conference and Breeders Expo. At the Greenspoint Marriott, Houston Texas. For more info call David Doherty (281) 367-4963 or Russ Walker (409) 594-5554.

September 6: The Third American Frog Day. 9am - 4pm. First Assembly of God Church, 801 Hellyer Ave., San Jose, California 95111. For information contact Charles Powell (408) 363-0926.

September 6-7: Reptile Expo will be held at the Orange County Fairgrounds, Costa Mesa, CA. For info contact: (707) 578-3976.

September 13-14: Pet Mania Pet and Reptile Expo. Benton-Franklin Fairgrounds, Kennewick, Washington. For info call Larry Bright (509) 375-0435.

September 13-14: Mid-Atlantic Reptile Show held at the Maryland State Fairgrounds. For information contact Tim Hoen (410) 557-6879.

September 13-14: Texas Reptile Expo, All Captive Bred Show, Comfort Inn Hotel, 1601 E. Division, Arlington, Texas. For more info call (903) 862-2291 or fax (903) 862-2294.

September 20-21: Reptile Expo will be held at the Arizona State Fairgrounds, Phoenix, AZ. For info contact (707) 578-3976.

September 21: 2nd Annual Rocky Mountain Reptile Breeders Show and Sale. Adams County Fairgrounds, Denver, CO. Call (303) 905-6848 for more info.

September 27-28: Florida International Reptile Show will be held at the Florida State Fairgrounds Expo Hall, Tampa, FL. For info contact: Doug Wagner (813) 771-1368 or email Dwagner200@aol.com

September 28: Big Apple Reptile Show Sunday - September 28, 1997 from 9 am to 5 pm. The Place - The luxurious Melville Marriott. For more information call the 24 Hour Show hotline at 516-338-0551 or our show

site on the world wide web at www.herp.com/bashow.html

September 28: The 7th Annual Midwest Breeders Expo sponsored by the Kansas City Herpetological Society will be held at the Airport Hilton Hotel in Kansas City, MO. For more information call (816) 468-5609.

October 4-5: Exotics & Family Pet Showcase will be held at the Garden State Race Track, Cherry Hill, NJ. For info call (215) 721-7199.

October 4-5: The International Reptile Breeders Convention will be held at the San Diego Community Concourse, San Diego CA. For info call Ray Busby at (619) 263-6898.

October 12: The 3rd Annual Nebraska Herp Society Swap meet. 10am - 5pm: Newtower Inn, 7764 Doge St, Omaha NE 68144. Info contact Dave Collins (402) 323-8566.

October 18: Southern California Herpetology Association Annual Reptile and Amphibian Show & Sale. 10 am - 4 pm: El Dorado Park Recreation Center, 2760 Studebaker Road, Long Beach, CA. Info contact Steve (562) 498-3211.

October 19: Reptile Expo will be held at the Sonoma County Fairgrounds, Santa Rosa, CA. For info contact: (707) 578-3976.

November 1-2: Exotics & Family Pet Showcase will be held at the Memorial Hall at York Fairgrounds, York, PA. For info call (215) 721-7199.

November 1-2: Reptile Expo will be held at the Santa Clara County Fairgrounds, San Jose, CA. For info contact (707) 578-3976.

November 6-9: The Long Island Pet Expo held at Nassau Coliseum, Long Island, New York. For info call (800) 886-8000.

November 22-23: The International Reptile Breeders Convention is in Mesa, AZ at the Community and Conference Center. For info call Ray Busby at (619) 263-6898.

November 23: The NY Metro Reptile Expo. Crowne Plaza Hotel in White Plains, NY (1/2 hour) north of NY City. Hours are from 9am to 4pm, and admission is \$6/adults, \$3/children 5012. Under 5 is free.

December 6-7: Reptile Expo will be held at the Pomona Fairplex, Pomona, CA. For info contact (707) 578-3976.

December 13-14: Reptile Expo will be held at the Cow Palace, San Francisco, CA. For info contact: (707) 578-3976.

February 1, 1998: The NY Metro Reptile Expo. Crowne Plaza Hotel in White Plains, NY (1/2 hour) north of NY City. Hours are from 9am to 4pm, and admission is \$6/adults, \$3/children 5012. Under 5 is free.



BLACK JUNGLE
Terrarium Supply
WIDEST VARIETY OF TERRARIUM WOOD
INTERESTING VIVARIUM PLANTS
NEW!
DECORATIVE
LAVA ROCK
FOR NATURAL
WATERFALLS
Send \$1.00 for Catalog
P.O. Box 93895, Dept. V
Las Vegas, NV 89193
WEB SITE: [HTTP://WWW.BLACKJUNGLE.COM](http://www.BLACKJUNGLE.COM)

G&M REPTILES, Inc.

INTERESTED IN THE FUTURE OF REPTILE BREEDING? CONTACT US HERE AT G&M REPTILES. WE ARE WORKING WITH SOME OF THE HOTTEST COLOR AND PATTERN MUTATIONS AVAILABLE IN BOAS & PYTHONS.

GHOST BOAS
ALBINO BOAS
STRIPED ALBINO
HYPO-MELONISTIC
RED TAILED BOAS
MANY OTHER EXCITING SPECIES
OF BOAS & PYTHONS AVAILABLE.

CONTACT US FOR A FREE PRICELIST.
P.O. BOX 1261 ~ STEPHENS CITY, VA. 22655
PH: (540) 869-1631 FAX: (540) 869-0140

WE ARE A NEODESHA CAGE DEALER
CALL FOR PRICING.

VISA, MC, DISC, AMEX ALL ACCEPTED

SUBSCRIBE TO THE VIVARIUM

**CALL TODAY TO SUBSCRIBE AND DON'T
MISS A SINGLE EXCITING ISSUE...**

800-982-9410

YOU CAN PAY BY CREDIT CARD, CHECK BY PHONE, OR WE CAN BILL YOU!

GRADUATE TO A HIGHER **I**NFORMATION **Q**UOTIENT WITH OUR
NEW **E.F.I** GUARANTEE!



**EVERY FABULOUS ISSUE OF THE VIVARIUM IS NOW
GUARANTEED TO CONTAIN ARTICLES ON ALL OF
YOUR FAVORITE HERPS!**

INCLUDING: AMPHIBIANS, BEARDED DRAGONS,
BOAS & PYTHONS, CHAMELEONS, COLUBRIDS,
GECKOS, IGUANAS, HERP MEDICINE, HERP
PHOTOGRAPHY, TURTLES & TORTOISES, AND
VIVARIUM DESIGN....

ALL IN EVERY SINGLE ISSUE!

**DON'T RISK MISSING AN ISSUE,
CALL TO SUBSCRIBE TODAY!**

IF YOU WISH TO SUBSCRIBE BY MAIL PLEASE FILL OUT AND DETACH THIS
BOTTOM PORTION AND RETURN IT TO:

THE VIVARIUM
P.O. BOX 300067
ESCONDIDO, CA 92030-0067

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

COUNTRY: _____

PHONE: _____

PAYMENT METHOD: ☐ BILL ME

☐ PAYMENT ENCLOSED

PLEASE CHECK THE APPROPRIATE BOXES:

☐ 1 YEAR SUBSCRIPTION
\$28 - U.S./\$36 - FOREIGN ORDERS

☐ 2 YEAR SUBSCRIPTION
\$53 - U.S./\$69 - FOREIGN ORDERS

☐ AIRMAIL UPGRADE
CANADA/MEXICO - \$8 PER YEAR
ALL OTHERS - \$16 PER YEAR

The Search is Over.

Back Issues of The Vivarium can now be ordered by phone!

Now with one easy toll free call you can purchase the back issues you've been looking for.

Call Today 800.982.9410

orders taken 24 hours a day.

We accept all Major Credit Cards and now offer the ultimate convenience... Check by Phone!

Volume 1 Number 4

AHF Interview: Clyde Peeling
Field Observation on Phrynos Williamsi
Herpetoculture of the Amazon Tree Boa
Care and Breeding of Two Species of Cordylid Lizards

Herpetoculture in Alaska
Popular Vivarium Frogs (Photo Essay)
Mites and the Herpetologist (Vet. Column)
The Black & Louisiana Pine Snakes
Endangered Species and Placing Blame

Volume 2 Number 2

Care & Breeding of the Chinese Twin-spotted Rat Snake

Interview: Richard Ross, M.D. (Part I)

The Chinese Crocodile Lizard

Poisonous Plant Update

Photography Centerfold

Notes on the Little Grass Frog

Volume 2 Number 3

Interview: Richard Ross, M.D. (Part II)

To Scent or Not to Scent—Techniques on Feeding Baby Snakes

Metabolic Bone Disease in Captive Reptiles (Part I)

The Mandarin Salamander in Captivity

The Bog Turtle

Volume 2 Number 4

Herpetoculturists, The Pet Industry, and The Fate of the Biosphere

First World Congress of Herpetology

Keeping Leopard Tortoises in Southern Arizona

Metabolic Bone Disease in Captive Reptiles (Part II)

Small Rattlesnakes

The Hardy and Prolific Sand Boa

After the Tourists Have Gone—The Agamas Come Out to Play

Volume 4 Number 1

The Giant Viper of Africa

Preliminary Observation on the Behavior and Captive Management of the Flying Dragon, (*Draco* sp.)

The Importance of the Contributions of Amateurs to Herpetology

Nesting Habits of the Northern Pinesnake

AHF Interview with Bob Johnson, Curator of Amphibians and Reptiles at the Metro Toronto Zoo

Shell Repair in Turtles and Tortoises

Volume 4 Number 4

Salmonellosis in Reptiles

A Century of Confusion: Asiatic Cobras Revisited

Bold Confidence and White Boas

Husbandry and Breeding of Collared Lizards

Desert Tortoise (*Gopherus agassizii*) Nesting Behavior

The Pacific Treefrog (*Hyla regilla*)

In Support of the Keeping of Boas and Pythons by the Private Sector

Volume 4 Number 5

Mealworm Heretic

The Inland Bearded Dragon (*Pogona vitticeps*)

The Natural History and Captive Husbandry of the Trans-Pecos Rat Snake (*Bogertophis subocularis*)

In Search of Tokage Modoki, The Japanese Leopard Gecko (*Goniurosaurus* [Eublepharis] kuroiwae)

Rediscovery of a Solomon Islands Monitor Lizard (*Varanus indicus spinulosus*) Mertens, 1941

Komodo Monitors Hatch at the National Zoo

Volume 4 Number 6

Heating Herps in the 1990's

The Texas Rat Snake (*Elaphe obsoleta lindheimeri*)

Three Species of Frogs of the Genus *Mantella*

Komodo Monitors

Lizard Column: Lizard Talk

Herpetological Medicine Column: Common

Reptilian Bacteria

Volume 5 Number 1

An Effective Method of Artificial Incubation for Mediterranean Tortoise Eggs

Husbandry and Breeding of Ball Pythons (*Python regius*)

Controlled Photography of Herps

Sand Boas (genus *Eryx*) in the Wild and in Captivity

Lizard Column: The Most Endangered Lizard in the World, the Jamaican Iguana (*Cyclura collei*)

Herpetological Medicine: Disinfection for the Herpetoculturists

Vivarium Plant Column: The Chinese Evergreen (*Aglaonema*)

Volume 5 Number 2

Stalking the Elusive Twig Mimic Snake (*Langaha nasuta*)

Maintenance and Breeding of the Central America Banded Gecko (*Coleonyx mitratus*)

Nomenclature Changes in Herpetology

Mexican Giant Musk Turtle (*Staurotypus triporcatus*)

Rainbow Boas (*Epicrates cenchria*)

Lizard Column: Lizard Tough Guys

Herpetological Medicine: Record Systems for the Herpetoculturists

Vivarium Plants: Snakeplants: *Sansevieria*

Volume 5 Number 3

Encounters with European Salamanders

The Current Taxonomy and Captive Breeding of the Rosy Boa (*Lichanura trivirgata*)

Captive Propagation and Husbandry of the Vietnamese Leaf Turtle (*Geoemyda spengleri*)

Lizard Column: Hatching Lizards at Home

Herpetological Medicine: Suggested Quarantine Procedures for Monitors and Tegus

Volume 5 Number 4

A California Yankee Visits the British Herpetological Society

Notes on the Natural History and Captive Husbandry of the Sonoran Mountain Kingsnake (*Lampropeltis pyromelana*)

To Peru in Search of Tropical Anurans

From Sawdust to Lizards: A Visit with Bert Langerwerf

Lizard Column: Ultraviolet Light and Lizards: More Than Meets the Eye

Herpetological Medicine: A Herpetoculturist's Guide to Feces and Fecal Parasite Examinations

Volume 5 Number 5

Carnivorous Lizards and their Diet

Spectral Characteristics of Lamps Commonly Used in Herpetoculture

Notes on the Natural History and Husbandry of the Temple Viper (*Tropidolaemus wagleri*)

The Reproduction of the Central American Bushmaster (*Lachesis muta melanoccephala* and *L. m. stenophrys*) for the First Time in Captivity

Lizard Column: Lessons from the Wild

Herpetological Medicine: Quarantine Procedures for Amphibians

Plant Column: Snake Plants (*Sansevieria*): A Photographic Essay

Volume 5 Number 6

Maintenance of a Productive Mouse Colony

Phyllomedusine Frogs of Latin America

Common Kingsnakes (*Lampropeltis getula*)

Management and Breeding of Seipp's Day Gecko (*Phelsuma seippi*)

Herp Horizons: The Book Boom

Herpetological Medicine: General Guidelines to Reduce Zoonotic Disease

AHF Profile: Lawrence Klauber

Pythons & Boas Column: The Savu Python (*Liasis*

mackloti savuensis)

Volume 6 Number 1

The Path to a Career in Herpetology

A Reproductive History of Monitors at the Dallas Zoo

The Importance of Rain Chambers in Herpetoculture

The Husbandry of Juvenile Green Anacondas (*Eunectes murinus*) in Captivity

Herpetological Medicine: Antibiotics and the Herpetile Patient

AHF Interview: Wayne Hill

Pythons & Boas: The African Giants

Herp Horizons: Herping Down Under

Volume 6 Number 2

The Biology, Status, and Captive Propagation of the Alligator Snapping Turtle (*Macrolemys temminckii*)

Halloween Herptiles

Herping in the Former USSR

Herpetological Medicine: Building a High-Humidity Retreat for Young Tortoises

AHF Profile: A Visit With Dave Barker

Amphibians: Through the Eye of the Amphibian

Pythons & Boas: Boas in the Spotlight

Herp Horizons: Domestication or Preservation

Volume 6 Number 3

Rattlesnake Roundups: Messin' With Texas

Herpetoculture in a Changing World (Part I)

Natural History and Husbandry of the Shingleback Skink (*Trachydosaurus rugosus*) and the Blotched Blue-tongued skink (*Tiliqua nigrolutea*)

Natural History of the Sierra Mountain Kingsnakes (*Lampropeltis zonata multicincta*)

Announcing the Natural Herpetological Alliance

Herpetological Medicine: Acclimation

Maladaptation Syndrome in Captive Amphibians

Herp Horizons: Going Commercial—When Herps Outgrow Their Hobby Status

AHF Profile: Sky Island Galapagos Tortoises: A Visit with Jeff and Kim Gee

Pythons & Boas: The Blood Python and other Subspecies of the Short-tailed Python (*Python curtus*)

Amphibians: Natural History and Captive Husbandry Notes on Lehmann's Dart-Poison Frog (*Dendrobates lehmanni*)

Volume 6 Number 4

Herpetoculture in a Changing World (Part II)

Taxonomy: The Making of Scientific Names

California Kingsnakes (*Lampropeltis getula californiae*)

Herpetological Medicine: Let There Be Light

Amphibians: Casque Headed Frogs of the Genus *Hemiphractus*

Pythons & Boas: The Southern Stars of Australia: Australia's Small Pythons

Herp Horizons: Herp Photography

Amphibians: Giant Salamanders (*Sauromalus varius*) An Arizona-Sonora Desert Museum Delight

Volume 6 Number 5

Notes from a Herpetological Field Trip to New Caledonia (Part I)

The Galapagos Islands—The Charles Darwin's Research Station: Darwin's Legacy

Captive Care and Propagation of California Kingsnakes (*Lampropeltis getula californiae*)

Amphibians: Giant Salamanders

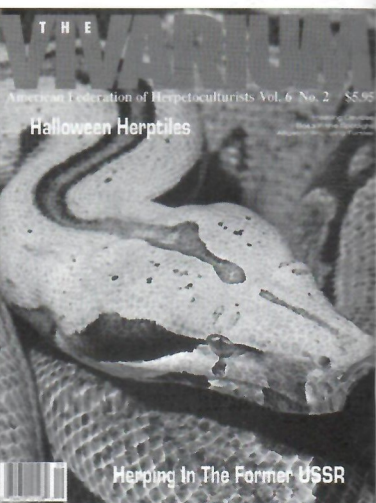
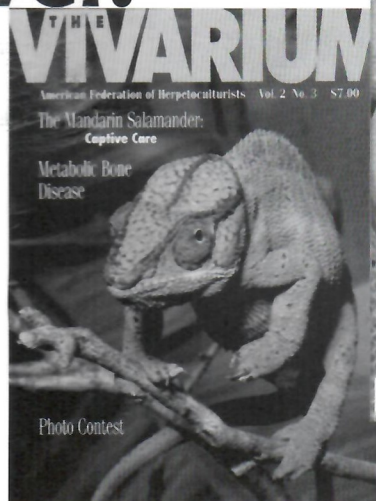
Herpetological Medicine: It's Not a Tumor!

Pythons & Boas: The Mechanics of Python Reproduction

Herp Horizons: Bits & Pieces

Volume 6 Number 6

Notes From A Herpetological Field Trip to New Caledonia (part II): Notes on Three Species of New Caledonian Geckos of the Genus *Rhacodactylus*



Teratoscincus: Natural History, Captive Maintenance, and Reproduction
Herpetological Medicine: Snake Venom Poisoning—What the Herpetoculturist Needs to Know
Natural History of the Mexican Burrowing Frog (*Rhinophrynus dorsalis*)
Pythons & Boas: The New Guinea Carpet Python and the Sawu Python, A Correct Common Name
Herp Horizons: What Hooked Us on Herps
AFH Profile: Grace Olive Wiley (1883-1948)

Volume 7 Number 1

Husbandry and Breeding of the Solomon Islands Prehensile-tailed Skink (*Corucia zebrata*)

Treasure of the Sierra Madre Orientals: The Northern Mexican Pine Snake (*Pituophis deppei jani*)

Some Notes on the Pincocchio Toad (*Bufo dapsilis*)

Limless Amphibians: Caecilians

Pythons & Boas: The Maintenance and Reproduction of the Dwarf Python (*Python anchietae*) of Angola and Namibia

AHF Interview: Dr. James B. Murphy

Volume 7 Number 2

Herpetoculture in a Changing World (Pt. III)

Breeding of Mertens' Monitor Lizard, *Varanus mertensi*

Natural History of the Scarlet Kingsnake, *Lampropeltis triangulum elapsoides*

The Dwarf Boa, *Ungaliophis*

Observations on the Growth of Juvenile Green Iguanas, *Iguana iguana*, Fed Four Commercial Diets

Blister Diseases

Designing a Tropical Rainforest Vivarium

Night Hiking the Río Momón, Perú

Big Snake Bites

Phelsuma Madness: A Visit With Tim Tyle

Volume 7 Number 3

How to Establish Ornate Uromastix

Captive Care/Breeding Emerald Tree Boa, —*Corallus caninus*

Breeding the Argentine B/W Tegu, —*Tupinambis teguixin*

Tropical Wet Forests of Costa Rica

General Ecology of *Cryptosporidium*

Big Snake Bites part II

Edward Drinker Cope

Volume 7 Number 6: Bearded Dragon Special!

Successful Breeding of Iguanas

Species and Morphs of Bearded Dragons

Vittikins Dragons

A Simple System For Raising Juvenile—Bearded Dragons Indoors

The North American Garter Snake

The Misunderstood Gray Rat Snake

Naturalistic Vivarium For Small Bearded Dragons

Preference For Formerly Frozen Mice Over Freshly Euthanized Mice by Captive Snakes

Volume 8 Number 1: Chameleon Special!

Jackson's Chameleons, Indoor Care, Feeding and Breeding

Annulated Boas, *Corallus annulatus*: Captive Reproduction and Husbandry

Captive Husbandry and Reproduction of the Veiled chameleon, *Chamaeleo calyptratus*

Is Multigeneration Captive Propagation of Heliophilic Chameleons Feasible Indoors?

Natural History and Captive Care of the Baird's Rat Snake, *Elaphe bairdi*

A Trip to Trinidad and Tobago in Search of Tropical Anurans

Successful Caging for Chameleons

Volume 8 Number 2

The Cutting Edge of Herpetoculture!

The Future of Herpetoculture

Great Tales of the Mad Gecko Hunters

Herp Technology on the Cutting Edge

Reptile Lighting

Natural History & Captive Maintenance of Mexican Hog-nose Snake, *Heterodon nasicus* kennedyi

Nutritional Status of Tortoises

Bark Substrates in Vivaria

How to be included in the Veterinarian Directory.

There are at least five million Americans who keep some type of amphibian or reptile. Many are at a loss when they need to find a veterinarian qualified to treat their pets. *The Vivarium* is widely read and distributed and is the first publication to offer a state by state herp veterinary directory in every issue. To obtain rates for a listing that also includes a one year subscription to *The Vivarium* magazine, Call: 800-982-9410

Attention Veterinary Clients!

Some veterinarians offer phone consultations. It is becoming standard practice to charge for phone consultations and you should establish a rate and estimate at the onset of your conversation. Please respect a veterinarian's policies on this issue. Their time is as valuable as your's.

ALABAMA

Robert Baker, D.V.M.

Robert Baker, DVM
Small Animal and Exotic Practice.
Trussville, AL (Birmingham Metro Area)
205-655-8538 205-655-5095 Fax

CALIFORNIA

Wilshire Animal Hospital

Frank Lavac, DVM
Daniel Levenson, DVM
Open 7 days a week. Serving West L.A. county for 65 years! Santa Monica, CA
310-828-4587 310-453-1452 Fax

Exotic Pet Vet Since 1974

 Dr. Roger Levoy
BaldyView Animal Hospital
La Verne, CA 91750
909-596-7771

COLORADO

Reptile Medicine & Surgery

Roger Klingenberg, D.V.M.
Phone & Fax Consultations
Available For: Medical Problems
Surgery
Hubandry & Breeding
Parasitology
Other Services:
Fecal Exams by Mail
Necropsies
Greeley CO 80634 970-351-0936

FLORIDA

Reptile Veterinarians

SOUTH KENDALL ANIMAL CLINIC
Specializing in Reptiles
Miami, Florida 305-238-2030

KENTUCKY

Kentucky's Exotic Veterinarians

Dr. Sam Vaughn - Dr. Joe Deck
Veterinary Associates - Stonefield
Louisville, KY 40223
www.aya.net/~aviansam
502-245-7863 502-245-2869 Fax

MARYLAND

Progressive Reptile Care

 Dr. Michael Szego, D.V.M.
Dr. Allan Frank, D.V.M.
• Full Medical & Surgical Facility
• Modern Diagnostic Capabilities - Blood Analyzer/Laposcopic & Endoscopic Equipment
• Emergency Service
Hunt Valley, MD 410-527-0800

301-498-VETS (8387)

Jeffrey L Rhody, DVM
• Herps, Ferrets, Rabbits, other "Exotics" as well as Dogs and Cats
• In Laurel - Midway btwn Baltimore & Washington Laurel, MD 301-498-8387 (VETS)
310-498-0816 Fax email: dad1vet2@aol.com

Place Your Veterinary
Directory Listing Here:
Call 800 · 982 · 9410

Medicine & Surgery

Gary A. Schwartz, DVM
Wheaton Animal Hospital.
Treating reptiles/amphibians in the Maryland-Washington, DC metro area. Boarding facilities provided.
Kensington, MD 301-949-1520

MASSACHUSETTS

The Turtle Hospital of New England

Barbara Bonner, DVM
Strongly conservation & herp-welfare oriented facility. Will accept & treat donated ill or injured patients in addition to traditional patients up to limits of facility. Extensive husbandry experience - some boarding available.
Upton, MA 01568 508-529-6811

MICHIGAN

Kenneth M. Harr, DVM

K.M. Harr, DVM
5900 Canton Center Road
Canton, MI 48187
Practicing Avian & Exotic Medicine for over twenty years.
313-459-1400

NEW YORK

HAMPTON

Hampton Veterinary Hospital
Dr. Jlu Jia Wen, DVM Dr. Karen Johnston, DVM
A full service veterinary hospital specializing in acupuncture, holistic & traditional methods of care for birds, cats, dogs, reptiles & other pets.
Speonk, New York 516-325-1611

Old Country Animal Clinic

 Robert A. Monaco, DVM
Plainview, NY
516-938-7218

TEXAS

Vet Calls-House Call Vet

 Ronni Karchach, DVM
Convenient at home veterinary care. Treat reptiles, cats, dogs, & small mammals.
Austin, Texas 512-306-9860

VIRGINIA

Experienced Reptile Vet

Herbert Hulls, DVM
Up-to-date medical & surgical treatment for reptiles & amphibians.
Convenient location and hours.
Virginia Beach, VA 757-473-0111

Herpetological Medicine & Surgery

Scott J. Stahl, DVM, ABVP-AVIAN
 Phone and Fax consultations available for a fee.
Fairfax, VA 703-591-3304 703-449-0673 Fax

Place Your Veterinary
Directory Listing Here:
Call 800 · 982 · 9410

NEKTON®

I want my NEKTON!

Complete Vitamin Supplements for
Reptiles & Amphibians
NEKTON's Quality Products

REP/REP-COLOR

- Help to protect all metabolic functions in reptiles and amphibians.
- Aid healthy bone growth and help prevent rickets.
- Promote smooth functioning of skin shedding.
- Help correct functioning of mucous membranes.

PLUS

- Supplementary Canthaxanthin and Apocarotinal in NEKTON-REP-COLOR to develop deepest colors and bring out faded colors.

MSA

- supplies breeding and young animals with essential mineral elements.

TONIC-R

- contains the nutritional requirements an animal's organism needs.
- is an effective aid to preventing vitamin and mineral deficiencies.
- helps support organism in times of stress.
- is excellent aid to treatment in times of illness.

For more information call or write:
NEKTON U.S.A., INC.
c/o Weinberg International
120 South Ring Avenue, Unit A
Tarpon Springs, Florida 34689
Phone (813) 939-0300
FAX (813) 939-0400






NEKTON® NEKTON®

G. Enderle Germany





Planted Vivarium Modules: A Revolution in Herpetoculture

by Vivarium Research Group, Inc.
All Photos by VRG

Because we at Vivarium Research Group Inc. are so determined to establish the "Third Wave of Herpetoculture" that focuses on attractive, naturalistic and complex vivaria, we decided we had to find a solution to what we saw as the primary obstacles to the popularity of this approach to vivarium design: the difficulty of finding plants and materials, and the time-consuming aspects of assembling a vivarium and learning the required skills. After a brain-storming session that lasted into the wee hours of the night and a weekend of experimentation, we came up with a revolutionary concept in vivarium design certain to change the future of commercial herpetoculture, particularly at the level of retail pet outlets.

What we developed are "Planted Vivarium Modules (PVMs)" containing plants proven to be adaptable to vivarium conditions which either singly or in groups will give an "instant good design effect" if introduced in a vivarium. Here we reveal how to design two kinds of modules for tropical vivaria that can be produced in volume for the commercial trade. By combining modules a very effective and attractive three-dimensional vivarium can be assembled in minutes.



Part of a shoreline vivarium enhanced by an epiphytic log with creeping fig and a rabbit's foot fern. Future articles will present a step-by-step design for creating this kind of shallow shoreline vivarium containing a combination of aquatic, semi-aquatic and terrestrial plants.

*Cork rounds are often more difficult to find than flat sections of cork but they are ideal for creating epiphytic logs. The principles of assembly are generally the same as above. Epiphytes such as orchids and bromeliads will grow in or on these logs as long as the right growing medium is selected. Generally, for orchids and bromeliads, orchid bark or an orchid bark/soil mix will work, depending on species. Other epiphytes such as *Tillandsia* bromeliads and miniature orchids can be anchored to the cork bark directly or against a clump of moss. In time, and if misted once or twice daily, the roots will grow and anchor the plant to the cork.*

How planted vivarium modules (PVM) can revolutionize vivarium design

- 1) They make designing a beautiful vivarium easy.
- 2) They assemble a wide selection of interesting and adaptable plants without having to spend hours investigating nursery selections.
- 3) They can be combined to make multi-layered and very three-dimensional vivaria
- 4) They make high quality vivarium design possible in minutes rather than hours.
- 5) They are easily removed, replanted and replaced.
- 6) They can make available a wide range of plants from expensive species such as orchids and rare vines or corms to inexpensive standard houseplant fare.

*An *Aglaomorpha* fern with *Kenilworth* ivy as a ground cover. Select cork sections with deep hollows. Place a thin layer of moistened green moss on the bottom. This will help trap soil and prevent it from leaching when you water. Then add potting soil up to the edges of the cork section. You can add additional moss at both ends or used crumpled plastic sheet then covering it with green moss. This is again to prevent soil leaching. Add plants to the soil. Combining plants that grow vertically such as bromeliads, ferns, and various herbaceous plants with plants that creep such as moneywort or dwarf creeping fig can lead to a neat effect simulating branches covered with epiphytes and vines in tropical forests. If you mound up the soil and if you want creepers to tightly cover the soil surface, the log can be wrapped with clear monofilament fishing line until the ground covers and creepers have spread and rooted into the substrate. The monofilament line can be clipped and removed at a later date.*



Self watering system for vivarium modules.

Vivarium modules can evaporate quickly if unwatered. To reduce the labor of watering, a mini irrigation system can be added to a planted module using an intravenous drip bag such as Virtual Rain® bags.

Above: A small arrowhead vine (Syngonium) with a dwarf mint ground cover. The potential harmful effects of mints on amphibians and reptiles need to be determined and we are currently experimenting with various species.

Right: The ESU Create-a-Cage is portable and easily assembled making it ideal for educational or show displays. The planted modules, because they can easily be shipped, are ideal for these nifty enclosure units. The following vivarium was assembled in under ten minutes using planted modules presented in this article. Total retail price of modules was \$65.00.



A rabbit's foot fern planted in a pitted rock sold as "lake rock." Rocks with hollows or depressions can be used for creating vivarium modules. The problems with rocks are their weight and the difficulty finding rocks with many depressions. Trips to local rock and gravel businesses will usually allow you to find one or two types of rock suitable for this kind of design. One problem with rock plantings is that, because they usually hold little soil, they tend to dry out rapidly. As a rule, daily watering will be required. To create a rock planting, add soil to a depression. Then, add plants including a ground cover which is recommended to reduce evaporation rate, to help anchor the planting and to reduce soil loss during watering. Done right, combining rock plantings for three-dimensional effects can result in very beautiful vivaria.



A cork planting with a miniature species of philodendron, a Nemanthus (a waxy-leaved gesneriad) and moneywort as a ground cover.

Vivarium Research Group Inc. is a Florida based company that designs and manufactures products for naturalistic vivaria.

Their fax number is 954.984.0012 and their web site address is www.vivarium.com.



Helix Controls



testudo kleinmanni at 10 days old

The Only Choice for Hard to Hatch Herps

A complete line of incubators and environmental control systems for the herpetoculturist

8535 Commerce Avenue, San Diego, CA 92121

Phone 619•566•8335

Fax 619•566•9472

SIMPLY-UNIQUE

Finally! A clean, simple, efficient way to add HERPCARE™ supplements to your Herp's food!



Most Herp foods, especially crickets, need to be coated with vitamin and mineral supplements to increase their nutritional value. But this has always been a messy and inconvenient process...until now! Introducing the HERPCARE™ Cricket Duster from Mardel. This specially designed cup coats foods efficiently, while preventing powdered supplements from being poured out with the food. The secret is the HERPCARE™ Dust Shield™ (patent pending). Just add supplements, the food to be dusted, shake and pour!

It's Simple. It's Unique. It's from Mardel.

M Mardel Laboratories, Inc.
1958 Brandon Court
Glendale Heights, IL 60139

Travel Trepidation Prepping Mentally, Part 1

by Bill Love . Photos by the author.

Knee-high, snake-proof boots, a gallon of heavy duty malarial mosquito repellent, and a personal bodyguard who doubles as a food-taster would be just some of the *indispensible* gear accompanying me on every trip abroad if my mother had her way. She'd try to talk me out of most destinations altogether if she had her choice in the matter. I've noticed over years of talking to friends and clients that she's not unique in her apprehensive approach to foreign travel. Deciding to leave the security of the United States is a mental hurdle that some people haven't yet been able to overcome.

What on earth am I implying — that there's a person alive who wouldn't leap at the chance to go traipsing off across the globe if given the opportunity? An explanation is in order.

A mild touch of travel trepidation has been ingrained into the psyches of most Americans during the last half of the 20th century. We've grown up *knowing* that the U.S.A. is the safest, most perfect haven on the planet, and we should be darn happy to be spending vacations right here. What need do we have of risking going to all those 'other' places where who knows what awful inconveniences and hazards await us?

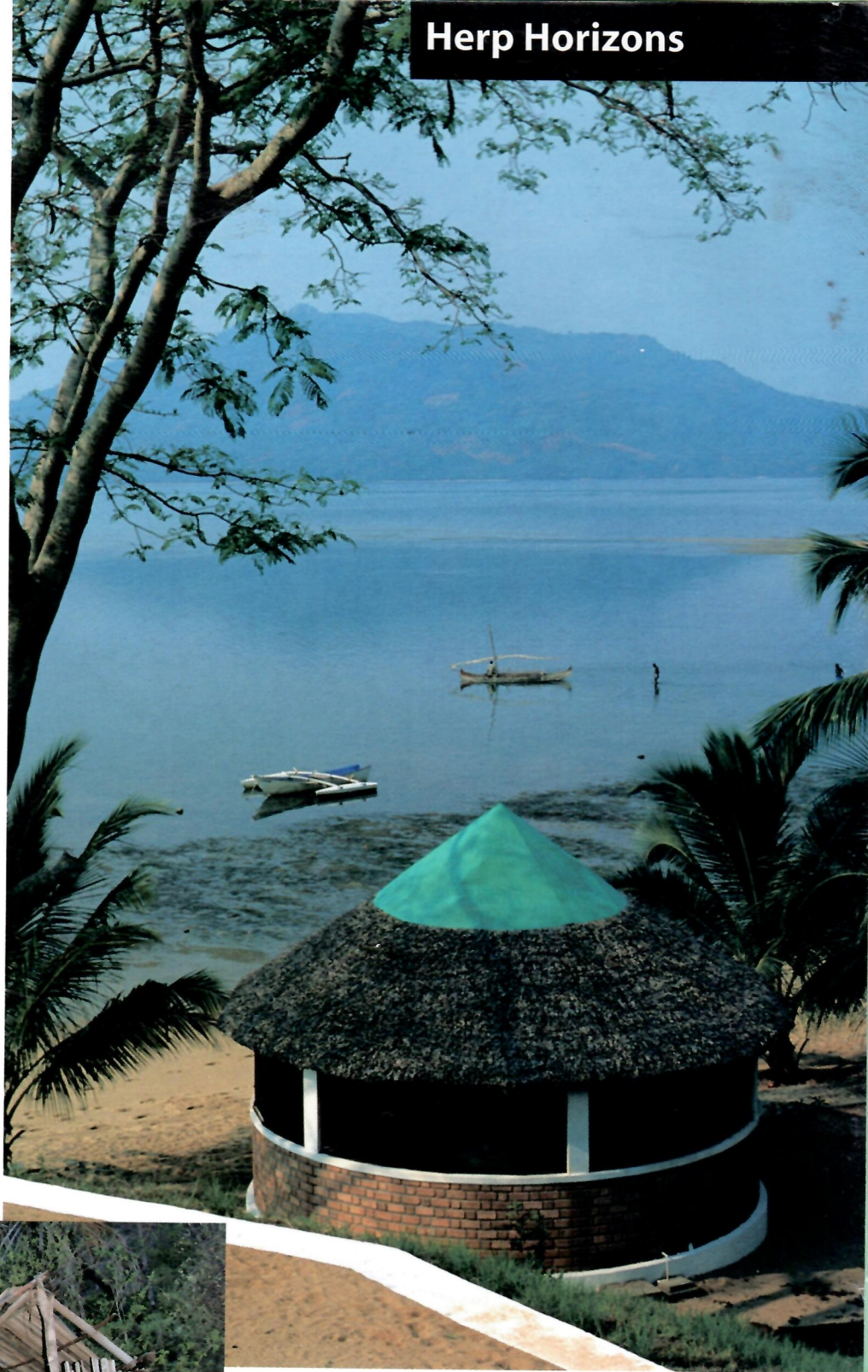
The Information Age is offering huge doses of knowledge to counter old concerns and prejudiced ideas about foreign countries and cultures. The wonders of the world are paraded across magazines, television, and computer monitors daily in an ever-growing barrage of enticing stories and ads. Globetrotting is appearing more inviting and friendly as the world figuratively shrinks. The chance to do it is once again becoming something to strive toward, not dread.

Is it 100% foolproof nowadays that you'll be safe on a trip abroad? Of course not! There will always be



Above: I've slept in places ranging from paradisiacal little beachfront cottages like this one, to stick huts cemented together with mud. Indoor plumbing, hot water and air conditioning are available sporadically even in wild and woolly little backwaters, but you should generally be willing to cope without such luxuries the further afield you wander.

Left: Depending on your sense of adventure, the array of arthropods inhabiting the simple earthen pit in this rustic campsite outhouse was either fascinating small game for your camera lens, or a nightmare that made you glad that sitting was not an option.





Our guide, Galoom, eating jack fruit. Exotic fruit are one of the treats of travel to tropical countries.



Roadside vendor near Ambasitra selling fried chicken heads.

advance previews in guidebooks, videos, and films. You're no longer stepping off into a mysterious black void.

With the ends of the earth literally at our fingertips, many people are embracing foreign travel once again as a great way to combine the thrill of discovery with their other interests and hobbies. They've accepted that not everyplace is like the U.S.A. — what would

some of the same old risks when you go out exploring the world, in search of herps or otherwise. You might encounter rude or unfriendly people. You could be pickpocketed or have your camera snatched. Exposure to a strange disease is an ever-present possibility. The realistic point to remember is that all this could also happen on the way to see your hometown travel agent to purchase the trip tickets.

Adventure travel has been evolving recently as a booming 'subspecies' of the travel business to accommodate our thirst for new information and experiences. It had traditionally been associated with the more physically demanding, or even potentially dangerous pursuits such as scuba diving, whitewater rafting or mountain climbing. The definition has broadened today to include virtually all trips in which the participant steps beyond the tour bus or cruise ship for a significant portion of the time. Today's diverse offerings can suit all tastes and comfort levels from luxury safaris to bare-bones hiking and camping trips. The degree of adventure (or adversity) is largely up to the customer to decide for himself.

Ecology and/or photographic safaris are very much in style today. Bird enthusiasts have been enjoying this goal of travel for decades, but it has only recently caught on with herpers. The preponderance of quality periodicals that have sprung up over the past ten years has much to do with popularizing the hobby, and creates an avenue for sharing the tales and pictures resulting from non-scientific field trips.

The cost of doing it has dropped to

within the grasp of average folks too. Can you imagine the cost for a trip to Thailand one hundred years ago? You can now save up for it as your annual vacation, and arrange it through a travel agent or tour company with just a phone call. People at your destination will be anticipating your arrival, and have prepared the basics of food and lodging to meet your needs. Much of the guesswork and uncertainty has been eliminated by readily available

be the point of going if it was? They're willing to tolerate inconveniences, and maybe even suffer some minor hardships, to see firsthand what the rest of the world is like — to see how and where their favorite herps actually live in the wild.

We'll delve into this a bit further next time.... 

Specializing in CHAMELEONS

(Farm-raised Imports & Captive-bred)

Now!

**The Largest
Selection of
Arrow Frogs
Available in
the USA**





**Reptile
Specialties**

By Appointment Only—John Uhem
Tel: (818) 352-1796
Fax: (818) 353-7381
7473 Foothill Blvd., P.O. Box 31
Tujunga, CA 91042

Sandfire™ Dragon Ranch



BOB MAILLOUX
PROPRIETOR

P.O. Box 3152 • Vista, CA 92085
(760) 726-4878 • (760) 726-9980
<http://ally.ios.com/~afh/sandfire/sandfire.htm>

Create a beautiful and natural living environment for reptiles, amphibians and small animals in minutes!



ESU Reptile®

CREATE-A-CAGE™

Energy Savers Unlimited, Inc. presents the most unique and versatile new cage to enter the pet industry in years. Create-A-Cage™ is the first collapsible cage using plexiglass wall panels, making the enclosure stronger than glass and much more practical than wire. Create-A-Cage assembles in minutes to create a beautiful and natural living environment for reptiles, amphibians, small animals and plants.

Create-A-Cage has a molded plastic lid with built-in screen top to accommodate a 20" Bi-Light, 20" Combo Light, or Heat & Light Reflector Dome (*not included*). Space is provided underneath for an optional under-the-tank heater. The cage also comes with a dam accessory to separate soil from water, creating a vivarium.

Assembly takes only a few minutes and the cage breaks down for cleaning just as fast. Simply snap in interlocking corners, fit plexiglass panels into interlocking corners, place lid on top and secure with four holding pins.



The Create-A-Cage requires less maintenance than standard aquarium tanks. To access the cage simply lift the top, or lift the top and pull up a plexiglass panel. To clean, just remove the bottom tray and wash.

Create-A-Cage also makes a great miniature greenhouse for starting or growing herbs and flowers.

Create-A-Cage comes in three sizes: Medium, 16" x 16" x 19" (20 gallon aquarium equivalent), Medium Tall, 16" x 16" x 23" (25 gallon equivalent), both accommodate a Heat & Light Reflector Dome

(*not included*), and Large, 24" x 24" x 23" (55 gallon equivalent), which accommodates a 20" Bi-Light, 20" ComboLight, or Heat & Light Reflector Dome (*not included*).

The compact design of the Create-A-Cage makes it ideal for storing in limited spaces, each size breaks down and stores in its 5 1/2" deep carton.

TO A REPTILE, IT'S A TRIP TO THE SALAD BAR.

When it comes to nourishing your reptiles the natural way, Reed's Iguana and Tortoise Foods from Tetra TerraFauna are the only choice for a complete and balanced diet. Newly formulated, Reed's contains full-spectrum color enhancers, plus complete nutritional requirements for the life of your reptile. Formulated to bring out the natural color in your reptile, Reed's is available in both adult and juvenile formulas. Reed's is not like other dry foods; it contains no animal by-products, is not high in protein, and replaces potentially toxic vitamin A with beta-carotene. Reed's is the only food source necessary for your pet. Available in containers that protect the food from UV light deterioration, Reed's also has a flip-top lid for more convenient

meal preparation. So if you want an easy, complete diet that provides your iguana or tortoise with all of the nutrients it needs to bring a splash of color into its life, ask for Reed's from Tetra TerraFauna.



Tetra
TerraFauna®

Copyright © 1997 Tetra TerraFauna, 3001 Commerce Street, Blacksburg, Virginia 24060-6671 (540) 951-5400, Fax: (540) 951-5415 Visit us on the web at <http://www.tetra-fish.com>
Tetra TerraFauna® is a trademark.