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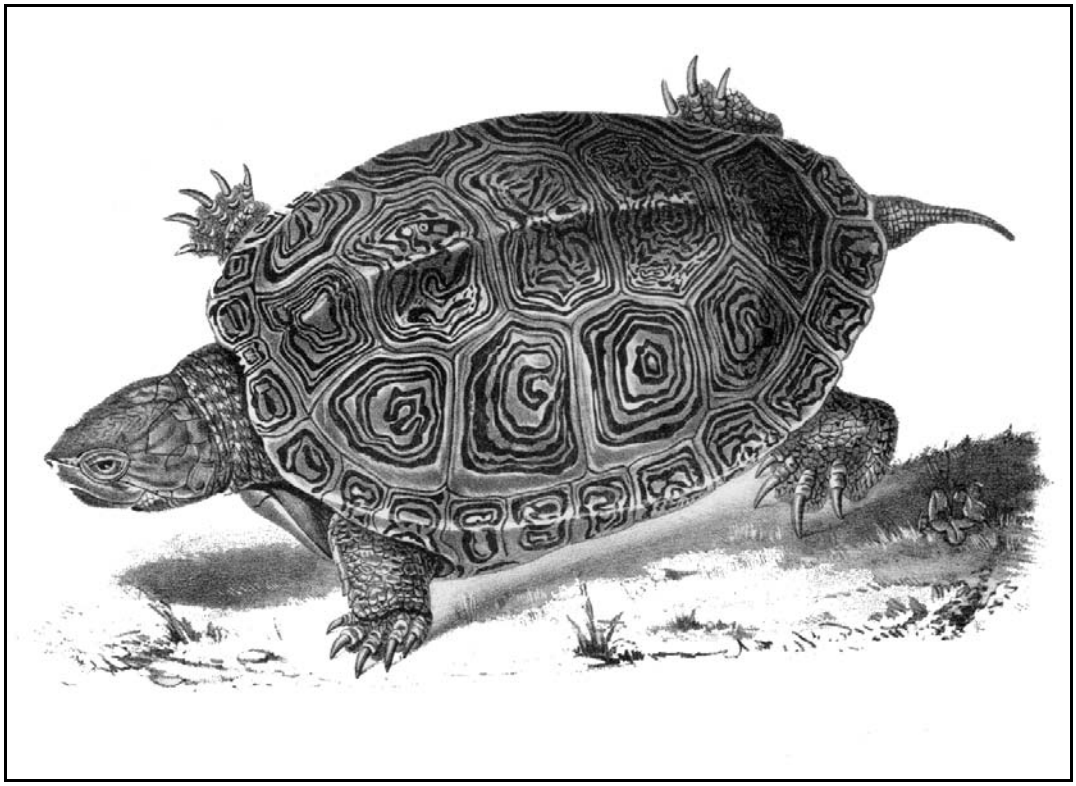

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Cover: Diamond-backed terrapin, *Malaclemys terrapin*. Drawing (as *Emys terrapin*) from *Zoology of New-York or the New-York Fauna. Part III. Reptiles and Amphibia* by James E. De Kay, 1842.

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Reproduction in Banded Rock Lizards, *Petrosaurus mearnsi* (Squamata: Phrynosomatidae)

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Abstract

Histological examination of gonads from banded rock lizards, *Petrosaurus mearnsi*, revealed a spring period of spermiogenesis (sperm formation) that encompassed March to June. Yolk deposition began in April and concluded in June. New minimum sizes for reproduction in males and females of *P. mearnsi* are reported. Mean clutch size for 13 females was 3.8 ± 1.9 SD, range = 2–7. I found no evidence that multiple clutches were produced in the same reproductive season. Seven is a new maximum clutch size for *P. mearnsi*. *Petrosaurus mearnsi* inhabits a small geographic range with narrow habitat restrictions, and produces only a single small clutch of eggs yearly. Therefore, collecting of this species from the wild should be closely monitored.

Banded rock lizards, *Petrosaurus mearnsi* (Stejneger, 1894) are a saxicolous (rock-dwelling) species, restricted to the arid parts of the Peninsular Ranges in southern California and Baja California, Mexico (Dugan, 2009). The most comprehensive information on *P. mearnsi* reproduction is in Hain (1965), Cozens (1974) and Dugan (2009). Anecdotal information is in Behler and King (1979), Stebbins (1954, 2003), and Lemm (2006). According to these works, *P. mearnsi* breeds during the spring and produces one clutch of 2–6 eggs deposited between June and August. The purpose of this note is to provide additional information on the reproduction of *P. mearnsi*. Information on the reproductive cycle is important for formulating conservation policies to protect and maintain animal populations.

Methods

A sample of 134 *P. mearnsi* consisting of 60 adult males (mean SVL = 79.6 mm ± 4.6 SD, range = 68–88 mm); 45 adult females (mean SVL = 77.1 mm ± 3.6 SD, range = 70–83 mm) and 29 juveniles (mean SVL = 55.0 mm ± 8.3 SD, range = 36–69 mm) collected 1926 to 1971 was examined from the herpetology collections of the Natural History Museum of Los Angeles County (LACM), Los Angeles, California, USA, and the San Diego Society of Natural History (SDSNH), San Diego, California, USA (see Appendix).

The left gonad was removed and embedded in paraffin. Histological sections were cut at 5μm and stained by hematoxylin followed by eosin counterstain (Presnell and Schreibman, 1997). Enlarged follicles > 5 mm length and oviductal eggs were counted. The SVL of each specimen was measured from the tip of the snout to the posterior margin of the vent. An unpaired t-test was used to compare *P. mearnsi* male and female mean body sizes (SVL) and the relationship between egg number and female SVL was examined by linear regression analysis utilizing Instat (vers. 3.0b, Graphpad Software, San Diego, CA).

Results

The mean SVL of males was significantly larger than that of females (2 tailed *t*-test, $t = 3.1$, $df = 103$, $P = 0.002$). Cozens (1974) also reported adult males of *P. mearnsi* were larger than adult females. Monthly stages in the testicular cycle are shown in Table 1. Three stages were observed in the monthly testicular cycle: (1) Regression: seminiferous tubules contain 1–2 layers of spermatogonia and interspersed Sertoli cells: (2) Recrudescence: there is a proliferation of germ cells for the upcoming period of spermiogenesis. The spermatogenic cycle has progressed so that primary, secondary spermatocytes and a few spermatids are present; (3) Spermiogenesis; seminiferous tubules are lined by sperm or clusters of metamorphosing spermatids. Cozens (1974) reported the smallest reproductive male measured 73 mm SVL. In my study, the smallest reproductively active male (spermiogenesis in progress) measured 68 mm SVL (LACM 95356), was collected 12 April, and is a new minimum size for reproductive maturity in male *P. mearnsi*.

Four stages were noted in the monthly ovarian cycle of *P. mearnsi* (Table 2). These were: (1) Quiescent: no yolk deposition; (2) Early yolk deposition: basophilic yolk granules present in ooplasm; (3) Enlarged ovarian follicles (> 4 mm); (4) Oviductal eggs present. Mean clutch size for 13 females was 3.8 ± 1.9 SD, range = 2–7. A linear regression analysis revealed there was no correlation between female body size (SVL) and clutch size ($P = 0.66$). There was no evidence (e.g., oviductal eggs and concomitant yolk deposition for a subsequent clutch in the same female) to indicate *P. mearnsi* produces more than one clutch in the same reproductive season. A clutch of seven eggs is a new

Table 1. Monthly stages in the testicular cycle of 60 *Petrosaurus mearnsi* from Baja California, Mexico, and southern California.

Month	n	Regression	Recrudescence	Spermiogenesis
February	1	0	1	0
March	10	1	7	2
April	24	2	9	13
May	15	2	3	10
June	6	1	1	4
July	2	2	0	0
August	1	1	0	0
September	1	1	0	0

Table 2. Monthly stages in the ovarian cycle of 45 *Petrosaurus mearnsi* from Baja California, Mexico, and southern California.

Month	n	Quiescent	Early yolk deposition	Enlarged follicles > 5 mm	Oviductal eggs
March	5	5	0	0	0
April	16	14	2	0	0
May	17	6	3	7	1*
June	7	2	2	1	2*

* denotes oviductal females whose eggs were not counted.

maximum clutch size for *P. mearnsi*. Cozens (1974) reported the smallest reproductive female measured 72 mm SVL. In my study, the smallest reproductively active female (early yolk deposition, measured 70 mm SVL (LACM 95408), was collected 17 April and is a new minimum size for reproductive maturity in female *P. mearnsi*.

The gonads of 29 subadults were examined to determine the minimum sizes for maturity of *P. mearnsi*. The smallest juvenile collected measured 36 mm SVL (LACM 64417) and was collected 13 July. It may have been born earlier that year. According to Cozens (1974) hatchlings probably measure 35 mm SVL.

Discussion

Based on my observations and those of Cozens (1974), *P. mearnsi* produces a single egg clutch per reproductive season. Egg laying occurs during a brief period near the end of June and the first of July (Hain, 1965). In contrast, other phrynosomatid lizards from southern California may produce multiple clutches: *Sceloporus occidentalis* (Goldberg, 1974); *Sceloporus graciosus* (Goldberg, 1975); *Uta stansburiana* (Goldberg, 1977); *Phrynosoma mcallii* (Goldberg, 2011); *Callisaurus draconoides*, *Phrynosoma platyrhinos*, *Sceloporus magister*, *Uma inornata*, *Uma notata*, *Uma scoparia*, *Urosaurus graciosus* (Jones and Lovich, 2009). *Petrosaurus mearnsi* also inhabits a small geographic range (Dugan, 2009) and is restricted to habitats with large vertical rock surfaces (Hain, 1965). For the above reasons, collecting of *P. mearnsi* from the wild should be closely monitored.

Acknowledgments

I thank C. Thacker (LACM) and G. Pregill (formerly at SDSNH) for permission to examine *P.mearnsi*.

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Appendix

Specimens of *P. mearnsi* examined from southern California and Baja California, Mexico, deposited in LACM and SDSNH.
Baja California: LACM 64387, 64390, 64391, 64395, 64396, 95408-95410, 115563, 128035, 137905.
California: Imperial County LACM 64406, 95357-95362, 99424, 126161, SDSNH 635, 713, 10940, 10942, 11725, 11777, 11779, 11784, 13529, 13533, 57387, 57707, 57708, 60119, 62827, 62829; **Riverside County** LACM 4929, 23397, 27383, 27385, 34602, 34603, 34606, 34608, 52868, 52869, 52871-52873, 52875, 53356, 53567-53571, 53572, 53574-53576, 62480, 62482, 64403, 64404, 64413, 64415, 64418, 64419, 64426-64428, 73567, 95355, 95356, 95363-95367, 95370-95380, 95383, 95385, 95386, 95388-95398, 95400-95403, 115562,126161, 126163, 174029, 174030, SDSNH 19461, 19466, 19467; **San Diego County** LACM 4930, 4931, 64405, 64417, 64425, 95404-95407, SDSNH 139, 142, 152, 154, 2658, 2661, 2663,13526, 57459.

Book Review: *Amphibians and Reptiles: An Introduction to Their Natural History and Conservation* by Marty Crump. 2011. The McDonald & Woodward Publishing Company, Granville, Ohio 249 pp. ISBN: 978-1-935778-20-2. Softcover $29.95

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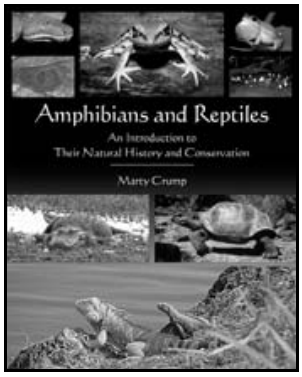

Know a youngster interested in herptiles? Just in time for the holidays, *Amphibians and Reptiles: An Introduction to Their Natural History and Conservation* has been released. If you know a youngster between the ages of 10 and 14 who is excited about herptiles, this book is sure to be a big hit when found under the Christmas tree. This book is an expanded and updated version of Crump's 2002 book, *Amphibians, Reptiles and Their Conservation* published by Linnett Press.

Due to the extensive changes made to the book, and owning both the 2002 and 2011 books myself, I suggest purchasing the new book even if you own the old one. The new book features a chapter on the key roles that amphibians and reptiles play in ecosystems, addresses the threat that chytrid fungus presents to amphibian populations, and contains information which ties in with key science concepts that are taught in middle-school and junior high. The text is sprinkled throughout with new vocabulary words, and a glossary is included in the back for ease of reference. The book also contains a nice appendix of additional sources that youngsters (and adults!) can use to learn more about reptiles and amphibians.

Crump's book is divided into 17 chapters and contains a large number of black-and-white illustrations which help to convey information about specific features of taxonomic groups and species as well as behaviors. A separate section containing color photo plates conveys the beauty of these creatures and the diversity of colors and patterns that can be found in nature. And although it may be disappointing to those individuals who are interested in and want to be sure that we all keep up with the latest taxonomic changes as they're made, I was relieved that Crump chose to stick with the traditional groupings of amphibians and reptiles.

The first chapter of the book is sure to catch the attention of youngsters, with its emphasis on the weird. This is the chapter with the interesting "factoids" about weird and unusual body forms, reproduction, and diet. The following chapter gives a general introduction to amphibians and reptiles, including explanations of how these groups are similar to one another, and how they differ.

The following three chapters (Chapters 3–5) provide more comprehensive information about each of the groups of amphibians and reptiles, their diversity, distribution and natural histories. This second section concludes with a chapter that delineates the key roles that amphibians and reptiles serve in both aquatic and terrestrial ecosystems.

Chapters 7–12 outline the declines in amphibian and reptile populations on a global basis, as well as why we should care about those declines and their root causes. There are chapters focusing on climate change, exploitation, habitat loss and degradation, and disease, particularly chytrid fungus. These chapters present these topics in a straightforward manner that emphasizes the fact that there are ways to counteract these threats.

Chapter 13 of the book examines the attitudes that humans hold about amphibians and reptiles. Much of this chapter focuses on how people from many different areas of the globe view specific groups of herptiles, and there is a tendency to focus on historical views, rather than present-day, Western views on these groups. It would have been nice to have seen some of the findings of the AZA's work on zoo visitors' attitudes toward amphibians and reptiles in this section.

The last four chapters are the chapters that so often are missing from these publications. I was really excited to see that Crump has four chapters dedicated to actions that either are being taken or that could be taken to conserve amphibian and reptile populations around the world. Perhaps most helpful is Chapter 17, "What can YOU do to Help?" in which nine actions are listed that youngsters and their families can take to help herptiles.

Teachers, naturalists, parents, and interested adults will find this book to be a gem and a huge hit with youngsters. It made me sad that I didn't have this resource available to me when I last taught a class for gifted 4th graders about herptiles. It would make an excellent textbook from which such a short course, or section of a science course could be taught.

I highly recommend *Amphibians and Reptiles: An Introduction to Their Natural History and Conservation*. It's the book that I wish had been available to me as a budding herpetologist!

Book Review: *Invasive Pythons in the United States* by Michael E. Dorcas and John D. Willson 2007. University of Georgia Press, Athens and London. 155 pp. ISBN-13: 978-0820338354 Softbound $24.95

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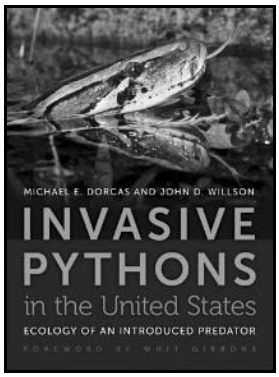

First, let's be clear—there is only one species of python that has a viable, self-sustaining population outside of captivity in the United States. This book is primarily about that single species, Burmese pythons, *Python bivittatus*. Second, and again for the sake of clarity, while this python species has been maintained by thousands of keepers in 49 states for more than 40 years, it exists outside of captivity only in extreme south Florida—not all over the United States. Not one word of the manuscript would have to be changed if the book were titled "Burmese pythons in South Florida." However, there is no doubt that the title, as published, lends much more excitement and urgency to the topic.

That appears to be the theme throughout this book—how to make the topic seem exotic and dangerous using loaded words and unfounded statements. The Foreword, written by Whit Gibbons, well illustrates the bias that pervades the book. In his first three paragraphs, Gibbons invokes the images of pythons created in *Tarzan in Africa* and *The Jungle Book* [both well known scientific accounts], refers to the media hysteria over pythons [largely driven by comments and interviews from the invasive python researchers, including Gibbons, himself], and compares pythons to rabbits in Australia, mongooses in Jamaica, and fire ants and carp in the USA. [It's later in the book that pythons get compared to kudzu in the southeastern USA and, of course, to the brown treesnake in Guam.]

Gibbons finishes his third paragraph with the following speculation: "The python invasion *may* rival all others in terms of its potential to completely alter the structure of the native ecosystems and to capture the public's attention" [italics ours]. We guess we can't exactly disagree with that loaded statement, but we point out that it's also possible that pythons ***may not*** turn out to be a problem. The Everglades is already the ecosystem with the most established alien and invasive species in the USA [and maybe in the world]; it's certainly possible that these "native ecosystems," such as they are, ***may not*** even falter with the introduction of pythons. In fact, pythons ***may*** fill an important ecological niche and benefit the Everglades by, for example, reducing the feral cat population and its predation. Juvenile pythons ***may*** serve as valuable prey for endangered indigo snakes and birds of prey. Or pythons may yet prove to be unsuited to even South Florida winters. Finally, while we are speculating, it's possible that the "public's attention" ***may*** fade if invasive python researchers quit telling them that pythons ***may*** eat their pets and children, as does Gibbons on the next page, and the authors in the Introduction, Chapter 2, Chapter 4, Chapter 6 and Chapter 7.

Gibbons's warning on the danger of pythons to humans is: "Records exist of *pythons* eating people in the wild . . . " [italics ours]. This is an example of how both Gibbons and the authors use the term "python" to refer both specifically to "Burmese pythons" and generally to "unspecified large python species" without identifying to which they refer. In thousands of years of written history in Southeast Asia, there exists only one story of a Burmese python eating a human; that report is an anecdotal, second-hand tale reported to Wall (1921) by a "European" who told him that many decades before, as a young man, he and his brothers had watched a Chinese infant being consumed by a "large snake" on Stonecutter Island near Hong Kong in the late 19th century. It certainly doesn't speak well of young European men, no matter what the snake. The largest snake native to that area would be the Burmese python. There is no known official record of the event and there is little reason to consider this as anything more than an imaginative child's tale or an old man's embellishment of a memory. Other than this single strange report, there are no records of a Burmese pythons ever eating a human.

On the second page of the Foreword, Gibbons manages to touch upon nearly every topic in the book, including: the controversy created by the inability of invasive python researchers to accept that Burmese pythons are now classified as a full species; the hypothetical [and discredited] possibility of extensive invasion of this country by Burmese pythons and other great constrictors; predation of pets and domestic animals; and public perceptions.

In the ultimate paragraph of the Foreword, Gibbons states " . . . invasions of giant predators from other lands were once limited to Hollywood horror movies and science fiction pulp magazines. Today they are the new reality." This from the scientist worried about media hysteria and public perceptions? That the comparison of reality to horror movies survived the pen of all critical readers and editors is indicative of the text that follows.

The Controversy

This book appears in the midst of a controversy centered on the presence of Burmese pythons in South Florida. The simplest summary of the controversy we can provide is as follows: In order to coordinate and facilitate study and management of the Burmese pythons in Florida, a working group of researchers, mostly Department of Interior employees, was formed about five or six years ago; they are identified as the Giant Constrictor Risk Assessment Partnership [aka "GCRAP"]. Over the past few years, GCRAP researchers have published a number of papers that all predict dire consequences to the environment and to humans due to the spread of Burmese pythons and warning of the possible establishment of nine other species that were identified by GCRAP as potential invasive species. In knee-jerk

response to the problems and scenarios predicted by GCRAP, the Department of the Interior proposed that Burmese pythons and nine other species be placed on the Injurious Wildlife List of the federal criminal statute called the Lacey Act; this is commonly referred to as the "proposed action." This would dramatically restrict international and interstate movement of the listed species. The ten species would have a federal label of "Injurious Wildlife," which would significantly increase the potential of research funding for GCRAP and colleagues. However, listing those species as Injurious Wildlife would negatively affect commerce in these species, amounting to a government taking of private property, and would inflict serious damage to thousands of American small business and families. Moving any listed species across state lines is a felony. Thus, up to a million Americans now legally keeping the proposed pythons and boas could be threatened with felony convictions should they purposely or inadvertently move their animals across state lines.

The controversy then revolves around the question of whether the enactment of the proposed action is appropriate. Our own position is that Burmese pythons should not be in the Everglades. Pythons in South Florida should be eradicated, if that is possible. However, it is hard to imagine that Burmese pythons have increased any potential danger to the public in the more than 30 years that they have been present in the Everglades. All visitors to the Everglades region of South Florida must exercise caution, but such hazards as might be posed by 800-pound alligators, huge cottonmouths, the biggest rattlesnake species in the world, feral hogs, bears, panthers, skunks and Burmese pythons haven't stopped park's approximately one million annual visitors.

To us it seems obvious that this is a local state problem, not some sort of national emergency. There is no doubt that the proposed action is ineffective; it is the wrong law for the problem. The Lacey Act has never before been used to regulate any species already present in large numbers throughout the United States. It is our observation that the invasive python researchers have behaved badly in this matter; they have published biased and weak science, manipulated risk assessments, and then used the media to create and circulate unfounded fears of snakes throughout the public. Dorcas et al. (2011) contracted with National Geographic television to film Burmese pythons that were left outside in the snow and ice of a South Carolina winter, expecting to demonstrate how Burmese pythons could survive northern winters; instead they watched the pythons freeze to death. GCRAP has an obvious vested interest to see the proposed action imposed, and they have effectively misused the media to circulate a variety of stories about the dangers of pythons, ranging from exaggerations to falsehoods. GCRAP has worked together with NGOs that actively lobby to remove animals from private ownership. This book is another publication in this controversy.

The Book

The authors are both PhDs, and both have impressive bodies of publications. Dorcas is older and has more publications, but Willson seems to be on schedule to have a successful academic career. In fact, Mike Dorcas, John Willson and Robert N. Reed all were post-doc students of Gibbons, the author of the Foreword. The four of them have co-authored numerous papers. [For those to whom the significance of our including Reed is unclear, he is a co-author of the paper making the original claim that the entire southern third of the continental USA is suitable for Burmese pythons (Rodda et al., 2008/2009) and of the report upon which is based the proposed action to list ten great constrictor species on the Lacey Act (Reed and Rodda, 2009).]

The significant majority of these authors' publications are on the general topic of United States herpetofauna, particularly of the Southeast. Both have published a significant percentage of their papers in ecological and conservation journals. However, prior to their involvement researching pythons in Florida, neither could be labeled an "invasion science biologist" in the same sense as the numerous researchers involved with Florida pythons who trained with and were benefactors of the government largess from the brown treesnake project in Guam. We had hoped that this book might raise the standard of quality for Burmese python publications written by the invasive python camp, a book similar in quality to, say, the excellent book *North American Watersnakes, A Natural History*, by Gibbons and Dorcas (2004). Unfortunately, this is not the case.

The authors state in the Introduction: "We hope this work provides an informative resource for both scientists and the public that will help to clarify issues related to these invasive snakes and quell the hysteria associated with this problem." This book falls short of those goals in several aspects. Scientists will find little of value in this book. The book is written for a popular audience and there are no citations or references to original literature anywhere in the book. There are statements made in this book that we strongly feel should have been credited to the original author(s) and other statements are made that we suspect have no footing in scientific literature. As we have pointed out, even the Foreword contains statements that contribute to the "hysteria" rather than do anything to quell it.

The book itself is attractive, softbound with a stiff glossy paper cover. It's crown-quarto in size (10" × 7½"), a convenient size to hold and read. There are 12 introductory pages, including the title page, contents and foreword; six of those pages are full-page images and the title page is a two-page image. There are 143 pages of text illustrated with 181 color images; the images are credited to 59 photographers and are well-printed. There are 13 figures and maps. Only seven pages of text are without an image or a figure. Each of the seven chapters of the text begins with a full-page single image. A total of 31 pages are only images, 18 of which are full-page single images; one full page is illustrated with two maps; and images cover half or better of 29 more pages. The last 13 pages of the book are not illustrated, beginning with the section titled "Further Reading," followed by acknowledgements, photo credits, and index.

The authors offer no new information for anyone familiar with the stream of publications that have come from the invasive python researchers and their colleagues and employees who are graduates of the "brown treesnake school of invasion biology." The information presented in the book is essentially a summation of those various reports and papers. Unfortunately, there are a number of topics wherein the authors have relied heavily on the incorrect, flawed and biased statements that have been

propagated in that literature. There is little evidence that the authors independently researched the older literature on Burmese pythons, nor the literature published in recent years that was derived from sources other than the invasive snake camp.

Contributing Authors

Scattered through the book are six sidebars, each written by a different contributor. These include a National Park Service biologist, a University of Florida professor, a USGS invasive python researcher, a citizen scientist, a member of the Miami-Dade Fire Rescue Venom Response team, and an alligator wrestler. The gist of four of these accounts is that on a particular day, these fellows encountered what seemed to them to be an amazing number of pythons in the Everglades. One is the anecdotal story of how a Burmese python seemed to be smart enough to wait to cross a road until traffic was clear. [Apparently the hundreds that have been found crushed on roads are the dumb ones. We know of no evidence to suggest that a century of traffic in the United States has selected for smarter native snakes when it comes to crossing roads.] Skip Snow, the NPS biologist, tells the story of how a radio-tagged Burmese ate a privately owned goose and how the owner insisted the NPS replace the goose. [We wonder if the park service replaces geese eaten by panthers, bobcats and raccoons.] The illustration for the sidebar on page 109 seems at first glance to illustrate the use of a donkey in caging a Burmese python.

We enjoyed the sidebars, but make this observation. The sidebars are not randomly chosen stories. Rather they are chosen specifically to enforce the idea that the Everglades region is overrun with pythons. We point out that according to Reed and Rodda (2009), one Burmese python is encountered in the ENP for every 1,317½ man-days of searching. That means that the average person would search for about 3.6 years to find a Burmese python in the Everglades. So if the sidebars were written by the average visitor to the park, nearly every story would read: "Went to ENP. Didn't see any pythons."

Quotes with Annotated Comments

To keep this book review from reaching book length itself, we will list a sampling of quotes taken from the text, each annotated with our comments in brackets. This seemed to us the best way to illustrate some of the good things we appreciate about the book, and some of the presumptions and speculations that also riddle this manuscript. We do recognize the potential of unfairness from isolating citations out of context; therefore we list the exact location in the manuscript of each of our excerpts so that a reader can go to the page to better understand the context.

" . . . squamate males have two penises (known as hemipenes) located in the base of their tail." (page 9, paragraph 2)
[This quote from the beginning of Chapter 1 illustrates the rather loose editing of the book that has allowed a number of grammatical and semantic errors throughout the book. First, the authors have a problem sticking to the plural point of view. Second, the word "penis" is used incorrectly; all penises may be male copulatory organs, but not all male copulatory organs are penises. There are several ways this sentence could be improved, such as " . . . the male squamate has two copulatory organs (each known as a hemipenis) located in the base of its tail."]

"The scales that cover the body of snakes and protect them from dehydration and injury are made of thickened, folded epidermis—the outer layer of skin." (page 9, paragraph 3)
[Snakes' scales are not just "folded epidermis" but rather "are thickened layers of epidermal and dermal tissues that form by folding of the integument during embryogenesis" (cited from Pough et al., 2004). The imbricate scales on the body of a snake are formed by a folding of the integument—not just the epidermis. Beneath the epidermis of every scale is the dermis, with the exception of the transparent scale that covers the eye. This is made evident by the color on the scales: it is a fact that most pigmented cells in snake skin are located in the dermis.]

"Their jaws are loosely connected to their skull, allowing snakes to stretch their mouth over their prey…" (page 10, first paragraph)
[This is another example of poor grammar: "skull" and "mouth" should be plural. We also take note of the description that the jaws are "loosely connected to their skull." Certainly anyone who has attempted to disarticulate the jaws or the quadrate bones from a python skull can attest that they are strongly attached. It may be a matter of picky semantics on our part, but the adverb "loosely" is, in our opinion, a poor choice. It supports the widely held but incorrect notion that snakes unhinge their jaws to eat. Rather, the jaws have "flexible" connections to the skull, and those flexible joints allow some lateral and independent movement of the mandibles and quadrates not seen in vertebrates with mandibular symphyses. The authors completely fail to communicate this. Finally, it seems a bizarre explanation of the feeding mechanisms of snakes to state that they "stretch their mouth over their prey." It is inexcusable for two scientists writing an important book on pythons to do no better than this.]

"Once inside the female, the hemipenis fills with blood and enlarges, and its numerous hooks and spines anchor it in place." (page 12, paragraph 2)
[Apparently the authors are unaware that the hemipenes of pythons are without hooks and spines; the hemipenes of pythons are ornamented with smooth flounces.]

"There are at least eight genera (related groups) of python species and at least 26 species." (page 13, paragraph 1)
[Rather than do the minimal amount of research to learn the exact number, here the authors apparently have given their own estimates of taxa in the Pythonidae. At the time of the publication of this book, the Pythonidae consisted of nine genera, 41 species and 54 total taxa (species and subspecies) (see Schleip and O'Shea, 2011; Jacobs et al., 2009; Zug et al., 2011). The authors are radically inaccurate in their estimates.]

", . . . in fact, some scientists believe that boas and pythons are closely related enough to be in the same family." (page 13, paragraph 1)
[Who are "some scientists"? This is an example of one of many statements where a reference would be appropriate. Yes, boas and pythons were once classified as subfamilies in the family Boidae, but currently are considered separate families. We are curious as to the identity of the scientists who "believe" that current systematics and classification of the Pythonidae are incorrect. To identify the anonymous critics as "scientists" gives

the statement false credence, as a "scientist" could be an astrophysicist, chemist, or invasive python researcher with personal opinions that bear no actual importance to the systematics and classification of the boas and pythons. We are not aware of recent published criticisms or revisions of the status of the Pythonidae; if the authors know of such, they should have taken this opportunity to enlighten their readers.]

"… and the infamous green anaconda of South America." (page 13, paragraph 1)
[Anacondas are infamous? Our unabridged dictionary defines "infamous" as (1) having an extremely bad reputation, (2) deserving of an evil reputation, shamefully malign, detestable. The authors think anacondas are evil and detestable? Infamous is an adjective we have never before encountered in scientific literature. Perhaps that is the point. This book is not and should not be considered to be a scientific document.]

Page 13 is illustrated with a map titled "The Global Distribution of Pythons."
The map is generally drawn. We note the following errors: There is no isolated population of pythons in Sichuan (Barker and Barker, 2010b); pythons do not occur on Taiwan (the island is only partly shaded and the shading may represent a printing error); there are pythons in the area of the Pilbara of Western Australia that is not shaded (Barker and Barker, 1994); there are no records of pythons above 30°N latitude on the Tibetan Plateau (Barker and Barker, 2010c); both *Python natalensis* and *Python anchietae* are found significantly further south in Namibia than is illustrated (Branch and Griffin, 1996); and the authors fail to include South Florida on their map [isn't that the point of their book?]

"The spurs are larger in males, which use their spurs to stroke the female during courtship." (bottom of page 13, continuing to top line of page 15)
[Here's the plural–singular problem again; "female" should be plural. This generalization is false—it is not true for all pythons that males have larger spurs. Spur size was once the gold standard for determining gender in pythons, but it has long lost favor because it is not uniformly true. In many species, including ball pythons, Burmese pythons and blood pythons, we have seen females with large spurs and males with small spurs. Male pythons often have very small spurs because they are worn down.]

"Some species, such as the green tree python (*Morelia viridis*) are almost always found in trees where they feed primarily on birds." (page 16, paragraph 2)
[Here is more evidence that the authors failed to do sufficient preparation and research to make this an authoritative book on pythons. In fact, birds are quite a rare dietary item for green tree pythons. Shine (1991) described the diet of *M. viridis* as comprising 56% reptiles and 44% mammals. This is supported by the observations of McDowell (1975) and O'Shea (1987). Interestingly, primarily terrestrial lizards and mammals were found in the stomachs of green tree pythons, evidence that the species spends significant time on the ground. Green tree pythons are often collected at night crossing roads (Mengden, pers. com.)]

"The role that pythons have played in inspiring young scientists and prompting wildlife appreciation and conservation should never be overlooked." (page 17, paragraph 1)
[Yes, an honest observation of an important phenomenon, yet they go on to say . . .]

"Unfortunately, some pythons escape or are released when owners do not want them anymore." (page 17, top of second column.)
[IF this is true, and IF pythons can exist all over the southern third of the continental USA (as predicted by Rodda et al., 2008/2009; Reed and Rodda, 2009; van Wilgen et al., 2009; and investigated by Dorcas et al., 2010), where are all the pythons? It follows that since Burmese pythons have been in captivity for more than 50 years, and since there are keepers and breeders in every state in the continental USA, and since no pythons are known to survive outside of South Florida, either (1) the pythons are not released or allowed to escape or (2) South Florida keepers are grossly irresponsible and negligent and they let pythons go all the time while the rest of the keepers in the country are very responsible and diligent, or (3) pythons cannot survive anywhere in the USA except South Florida. The authors fail to deal with this conundrum.]

"Although most of these snakes die or are killed by humans, release or escape of pet pythons likely resulted in the python and boa populations that are now established and spreading in South Florida." (page 17, top of second column.)
[This is an interesting observation. How is it possible that the "release or escape of pythons *likely* resulted in . . . boa populations that are now established . . . "? First the authors suggest that there is some question about the validity of the separation of the Boidae and the Pythonidae. There is not. And now they are proposing that pythons metamorphose into boas? Of course this is an overlooked mistake, but we think this has to be a Freudian slip—these guys and their critical readers obviously want to tie together the idea that pythons AND boas are a problem in order to justify the proposed action of the U.S. Fish and Wildlife Service to place five python species and five boa species on the Injurious Wildlife List of the Lacey Act. They also want to place all blame for the problem at the feet of private hobbyists and keepers—the proposed action is meant as a nationwide penalty for all python keepers as atonement for the presence of pythons in South Florida, no matter how it happened. We quote from a paper published just before this book, written by the authors and Gibbons: " . . . the exact circumstances that lead (sic) to introduction and establishment of Burmese pythons in Florida will never be proven." (Willson et al., 2011). Yet in that paper and in this book, the authors assign the responsibility for the establishment of Burmese pythons in South Florida to irresponsible and negligent keepers, saying it is *likely*, without evidence or data and based on their opinion.]
[More on that same quote: It's also important to note that the statement that "python and boa populations that are now established and spreading" is unfounded and false. The single population of boas, located in a Miami park, has not spread in the 40 years that is has been observed. With regard to Burmese pythons, the National Park Service has published data, based on captures and observations, indicating that there was no apparent population growth in the recent three-year period of 2008–2010, and that in 2011 there has been a 60% reduction in reported captures and sightings from what was reported in each of those previous three years.]

"Invasive snakes can devastate native ecosystems." (page 18, paragraph 2, in the subsection titled "Pythons as Potentially Invasive Snakes.")
[There are very few invasive or established alien snake species anywhere in the world and there is only one non-native snake that has wreaked damage to an ecosystem. That species is, of course, the brown treesnake in Guam, the poster child of the invasive python researchers, the snake that launched dozens of careers in invasive snake research. Guam is a small Pacific island less than one-twentieth the size of South Florida, about the area of the city of Columbus, Ohio. Guam has no native snakes; indeed, it had no predators at all. The birds there were fearless, several were flightless, and many nested in the open and on the ground. Any predator of any sort would have done ecological damage to the fauna of Guam. Comparisons between brown treesnakes in Guam, and Burmese pythons in Florida are invalid. Vertebrate prey in Florida all have evolved with predation, including snake predation, and there are many predators that eat snakes, including all ages of Burmese pythons.]

"And although a variety of animals can and likely do eat hatchling pythons, the hatchlings are too large (18–36 inches [45–90 cm]) to be prey for many of the native predators that typically eat young snakes." (page 18, last sentence on page)
[Hatchling pythons might be up to 36" long, (reticulated pythons, rarely) but most hatchling Burmese pythons are 16–22" and weigh about 65–100 g. Yes, predators that only eat 10" snakes can't eat baby Burmese pythons. However, that is a small subset of the snake-eating predators of South Florida. Potential predators of baby Burmese pythons include skunks, otters, dogs, cats, foxes, coyotes, bobcats, hogs, indigos, kingsnakes, cottonmouths, snapping turtles, raccoons, opossums, mink, panthers, alligators, crocodiles, great blue herons, red-tailed hawks, red-shouldered hawks, and great horned owls.]

"First, female Burmese pythons *may* be able to store viable sperm for long periods—*perhaps* even years—before they use it to fertilize their eggs." (page 20, top of second column, italics ours)
[Years? There are too many qualifiers in this supposition for it to have any scientific basis. There is no published evidence that we have come across, based on 35 years of Burmese pythons being bred in captivity, thousands of breedings, that this is true.]

"Second, there is evidence that female Burmese pythons can produce viable offspring without mating through a process called *facultative parthenogenesis*." (page 20, second column)
[The evidence is a report based on one Burmese python in the Artis Zoo of Amsterdam, housed with two other Burmese pythons; eggs were not hatched. Even if this report is valid, it would be a gross overstatement to say that Burmese pythons are a parthenogenetic species. Even the authors of the report describe Burmese pythons as a "normally sexually reproducing species of snake." (Groot et al., 2003). Again, the species has been selectively bred for unusual colors and patterns, and regular instances of parthenogenesis would be made very obvious by the failures of predicted Mendelian patterns of inheritance.]

These quotations have highlighted only a sampling of the grammatical errors and the questionable or incorrect statements in Chapter 1. The second chapter, titled "Natural History of Indian and Burmese Pythons" is even more biased and error-ridden. Unfortunately, the rest of the book follows suit. For reasons of brevity we are unable to highlight many more details of the book, providing the research and citations that should have been supplied by the authors. The following are what we consider to be particularly egregious statements:

"Most authorities consider the Burmese python to be a subspecies, or race, of the Indian python, *Python molurus*, and give it the name *P. molurus bivittatus*." (page 23, the first sentence of Chapter 2)
[Who are "most authorities"? A similar unreferenced statement is "Most authorities consider invasive python researchers to have a poor understanding of systematics and taxonomy." This first sentence in Chapter 2 is false and reveals a lack of understanding of systematics and classification by the authors, and apparently by their critical readers, as well. It's true that from the 1935 paper of Stull, until early 2009, Burmese pythons were considered a subspecies of *Python molurus*. Are authors from that period the "authorities"? Werner (1910) identified Burmese pythons as a full species. They had been so classified for most of the 19th century—why aren't authors from that era considered authorities? Scientific classifications change as phylogenetic relationships are better understood, but apparently when the changes are inconvenient, invasive python researchers just ignore them. Jacobs et al. (2009) classified Burmese pythons as a species, *Python bivittatus*. To our knowledge, since then the **only** papers that have embraced the dated classification of Burmese pythons as a subspecies were published by invasive python researchers or others with some connection to Burmese pythons in Florida. All other authors have followed the recommendations of Jacobs et al. (for examples, see Cota, 2010; Avery et al., 2010; Schleip and O'Shea, 2010; Engeman et al., 2011).]

"Robert Reed and Gordon Rodda (2009) include a detailed description of the geographic distribution of the *species* in their report on giant constrictors, and we use their report extensively here." (page 25, first paragraph in the subsection of Chapter 2 titled Geographic Range, italics ours)
[In this subsection and the rest of the chapter, the information presented is essentially useless because of the authors' failure to recognize Burmese pythons as a taxon distinct from Indian pythons. Even if the authors choose to identify *Python bivittatus* as a subspecies, it is this taxon only that is established in Florida. As it is, such information as is presented in this chapter is not applicable to Burmese pythons in Florida, ostensibly the subject of the book. We cannot imagine any possible reason for these authors to include data on Indian pythons, *P. molurus* (*sensu stricto*), in this book other than to continue the confusion created by Reed and Rodda. In their defense, the authors here do acknowledge our criticisms regarding the geographic and elevational distribution of *P. bivittatus* published in Reed and Rodda (2009) by listing two of our articles in their Further Reading section (page 143). The date is incorrect in the first of those listings—2008 should be 2010. Both references (see Barker and Barker, 2008, 2010c, in the Literature Cited below) presented evidence that contradicted Reed and Rodda (2009) and charged that Reed and Rodda—incorrectly and without supporting data—significantly exaggerated the climatic, elevational and geographic distributions of both *P. molurus* and *P. bivittatus*. At the very least, this should have motivated Dorcas and Willson to

independently research the literature for what is known about the distributions of the two species. We do note that the map of the distribution of *P. molurus* and *P. bivittatus* at the bottom of page 25 illustrates the unfounded exaggerations of Reed and Rodda (2009) in gray, identified in the legend as "uncertain distribution." Again, if the authors were uncertain of the accuracy of the report of Reed and Rodda (2009), why did they rely heavily on it? Why not do the research themselves?]

"The largest Burmese pythons certainly exceed 20 feet (6 m) and may approach 25 feet (7.5 m) in extremely rare circumstances." (page 28, paragraph 3)
[Yes, those would be rare circumstances indeed! In fact, those circumstances have only occurred in the dreams of invasive python researchers. We challenge the authors to find one valid report of a Burmese python longer than 19 feet that is unequivocally assignable to *Python bivittatus*. The species is not known to reach 20 feet, yet the authors show a maximum length of 27 feet in the table on page 129.]

"An additional climate-matching study published by Nicola van Wilgen and colleagues (2009) supported the idea that the climate of Florida and much of the Southeast is suitable for pythons and suggested that suitable climate also exists in the coastal Pacific Northwest." (page 74, paragraph 1, map at the bottom of page 75)
[In our estimation, the suggestion of the authors that the research and map of van Wilgen et al. (2009) might hold ANY credence, that it is even illustrated in this book, invalidates any slight contribution that this book might offer. There can be no more obvious illustration of the bias of the authors or the actual purpose of the book. This map suggests that the climate from Seattle to north of Vancouver is as suitable as the climate of Florida and Central America. This map shows the suitable climate for pythons to extend north to the Prince Rupert Sound at the southern margin of Alaska, with an isolated suitable area in southern Alberta, and another in NORTHERN Montana. We contacted van Wilgen and were told that the data on which this climate-match was based was gleaned from Reed and Rodda (2009). This is a classic example of the flawed science on which invasive python researchers have based their assessments.]

"Sound decisions relating to management of pythons should rely on unbiased, well designed science. Unfortunately, decisions with wide-ranging effects are sometimes based on outlandish claims perpetuated by the media politicians and various agenda-driven individuals and organizations." (page 41, first paragraph in Chapter 3)
[What? Is this some twinge of guilt coming from the invasive python camp? No, probably not, since the next section in this chapter introduces many of the members of GCRAP, who are the guys who actually made the outlandish claims that were then repeated ad nauseam by politicians and the media.]

The last chapter in the book is titled "Other Species at Risk of Becoming Established in the United States." Seven species are briefly discussed; six are species that were featured in Reed and Rodda (2009), and are included in the proposed action of the U.S. Fish and Wildlife Service to list ten species of great constrictors on the Injurious Wildlife List. The seventh is *Python regius*, ball pythons, one of the most popular captive snakes in the world with more than a million animals in this country. The authors warn that this species is likely to become invasive. Even if *P. regius* did establish a small population somewhere, it's hard to imagine how it would be considered an "invasive species"; more likely it would be given the less inflammatory label of an "established alien species."

In fact, the label of "invasive species" is legally defined in the National Invasive Species Act as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." The invasive python researchers have clearly given themselves free rein to misidentify all of the great constrictors as "invasive," arbitrarily granting them a more damaging and dangerous status. It can be argued that even Burmese pythons should not be designated as invasive.

This last chapter is filled with innuendo, implications and inferences, but nothing different that what is already published in Reed and Rodda (2009). We must mention this last nugget:

"It is not surprising that African pythons have gained a foothold in southern Florida. This species is so similar ecologically to the Burmese python that it would be logical to assume that areas suitable for Burmese pythons would also be suitable for African pythons." (page 131, last sentence on page)
[The northern African pythons, *Python sebae*, are a true equatorial tropical species. Their distribution is centered on the equator from about 17°N latitude to about 12°S latitude. So far as we are able to determine, all specimens imported since the 1990s have come from West Africa at 7–10°N latitude; most or all have been exported from Ghana, Togo and Benin. No climate and no ecosystem in the United States are even remotely similar to those of *P. sebae* in its natural range. The fact that Reed and Rodda (2009) were able to perform a "risk analysis" that would indicate otherwise should be taken as yet more evidence of the flexible nature of the outcome of any such analyses (Barker and Barker, 2010a). Additionally, *P. sebae* never had more than a toehold in Florida; very few specimens have been observed and all were in a small area in West Miami (Reed et al., 2010). Strict control measures implemented by the state of Florida will likely completely eradicate the species from the state.]

We cannot recommend this book. It is riddled with grammatical and factual errors. It maintains a palpable bias against pythons from the first page of the Foreword to the last page of text. There are no citations and references in the text and there is no Literature Cited. Such actual information as does exist within the manuscript is better read from the original papers.

Unfortunately this book provides little constructive information to the popular reader. The popular format allows the authors to weave together the story of an extraordinary snake species adapting to a new ecosystem with the quiet undertones of a modern monster horror story. It is a tale that inflates the importance of the invasive python researchers at the expense of the public sense of welfare. It is a colorful, well illustrated book designed to decorate the tables of the legislators and regulators who will vote to decide on the proposed action to place Burmese pythons and nine other great constrictors on the Injurious Wildlife List, and who will never read the book.

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What You Missed at the October Meeting

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I first met our October speaker about a year-and-a-half ago. I had the privilege of attending the Amphibian Biology, Conservation, and Management course presented by the Association of Zoos and Aquariums (AZA) and hosted by the Toledo Zoo. It was one of the finest training sessions I've attended, and I've attended many different training programs (one would think that by this time I'd be smarter than I am). The quality of the instructors made the program. They were intelligent, considerate, focused and dedicated, and they were good presenters. Indeed, one of them, Tim Herman, had already given a talk on the Kihansi spray toad [see Bull. Chicago Herp. Soc. 44(3):46-48]. At the time of the course in Toledo our October speaker actually volunteered to speak for the CHS, but that year we just couldn't make the schedules match.

So this year I really wanted Dr. Joseph Mendelson to speak, but by now he was President of the Society for the Study of Amphibian and Reptiles. He was busy before. What chance did I have of landing him now? Turned out not to be too hard, mostly because Joe is so dedicated to the cause of fighting amphibian declines and extinctions, and sees one of his jobs as spreading the word.

One of the nation's foremost experts in his field, Joe is responsible for the naming of more than 30 new amphibian and reptile species, and was among the first responders to the crisis of global amphibian decline. His research initiatives include biodiversity surveys in Latin America; natural history, ecological and taxonomic studies; and amphibian conservation research, outreach and diplomacy. He is President of the Society for the Study of Amphibians and Reptiles and serves on the Advisory Board of the Amphibian Ark.

Joe has a Bachelor's degree in Biology from the University of California at Santa Barbara, a Master's in Biology from the University of Texas at Arlington, and a PhD in Systematics and Ecology from Utah State University. In spite of a tight schedule that had him teaching in the morning and flying from Atlanta that afternoon, Joe was as affable and genial as I remembered when I picked him up at the airport, and his presentation reflected the quality he had displayed during that AZA course. His presentation was titled "Global Amphibian Extinctions: Lessons from the Lost."

In deference to a presumably knowledgeable audience, Joe quickly covered the basics with a slide illustrating the three groups of living amphibians. Most of the 7,000 species are frogs, a lot are salamanders, and a few are caecilians, and most of our knowledge about amphibian declines comes from studying frogs. Of the 7,000 (and still counting) species of amphibians, the International Union for Conservation of Nature (IUCN) lists 30% of them as extinct or in catastrophic decline. While many people are becoming jaded about endangered species, Dr. Mendelson emphasized that we now face a very different and much larger threat.

"Amphibian declines and extinctions are the clearest example we have of an entire class of animals threatened with extinction." — James P. Collins, Director of Biological Sciences, NSF

We are facing a mass extinction that has been proceeding since the 1970s and yet has only been recognized for the last decade or so. Joe led us through the process and history that brought us to our current situation. Mass extinctions were known from the fossil record, but none had been recognized currently. In a field where there are not enough researchers studying too few of the many different species, it was a gradual and often argumentative undertaking simply to grow consensus about the existence of a mass extinction. Then the scientists had to convince people that it mattered. Joe listed the reasons why we should care. This is a sign of global change, which may eventually be detrimental to our species. Ecosystems are changing as food webs are disrupted, ethical questions arise, aesthetics are degraded, and biomedical applications are lost. But this does give us an unparalleled opportunity to study a mass extinction. If we can't stop it, we would be shortsighted not to study it.

Causes of most current extinctions are well known. The three most common are pollution, human consumption, and habitat destruction. Joe stressed that the solution to these are well defined and easily enacted if the social, economic, and political obstacles can be overcome. Climate change is also a factor in declines. But the amphibian decline introduced a new element that no one had considered as a possible cause of extinction, emerging infectious disease.

Batrachochytrium dendrobatidis, or amphibian chytrid fungus, has been causing spectacular declines since the 1970s, but was only identified in 1998. The disease is unlike most other infectious agents that we know. It is found in all 7,000 species of amphibian on every continent where amphibians exist. Antarctica is chytrid free because it is amphibian free. It is almost certainly introduced throughout most of its range, but the means of invasion and the origin are unknown. It is easily cured in captivity but seems impossible to eradicate in the wild. The fungus seems to be particularly devastating to higher altitude stream-living species. The effects of infection are highly variable, with some species and some individuals tolerating the infection with no apparent ill effects. One population of a species may react differently from another. Joe illustrated the variability with three examples. A picture of a bullfrog (*Lithobates catesbeianus*) showed a species that seemed to tolerate infection with no ill effects, making it a carrier of chytrid, which is particularly unsettling considering how invasive bullfrogs can be. A photo of a pretty harlequin frog (*Atelopus* sp.) represented an entire genus that has been nearly eliminated in the wild, and a little slimy salamander (*Plethodon glutinosus*) draped over a finger displayed a species that has both individuals that succumb to the fungus and those that seem to tolerate it.

Maps demonstrated the march of devastation since 1974 through Central America and the South American Andes, ac-

companied by the prediction that the few remaining high altitude areas still fungus-free will become infected. Australia shows a similar pattern, and Africa and Asia have not been studied enough to map the disease's spread. Many western North American species are in jeopardy, but Dr. Mendelson had no guess as to why the eastern part of the continent seems not to have suffered.

Dr. Mendelson said that he went into herpetology for reasons not too far from why we enjoy these animals. He wanted to travel to unexplored regions, find new animals, capture some, and identify and name new species. During his career he has named 32–34 species. Four are considered extinct. Most can't be found in the wild. Some he has never seen and will probably never see alive. A picture of a treefrog filled the screen. Joe told of this new treefrog discovered in 2005. Large, an adept glider, laying eggs in tree holes, after which the male drives off the female and guards the eggs and raises the tadpoles by allowing them to rasp skin from his body. An extraordinary creature that was extinct in the wild by 2007. It was not until 2008 that Dr. Mendelson could describe and name the frog. He named it *Ecnomiohyla rabborum* in honor of Brookfield Zoo Director Emeritus George Rabb and his late wife Mary S. Rabb. Several frogs were taken into captivity in an attempt to breed them, but no institution was successful. The morning of our meeting he checked and confirmed that only two individuals of that species still survive. Both are males.

So instead of the career he had planned, he has become what he terms a "forensic taxonomist." As do many of his colleagues, he often describes species that have no range outside of jars sitting on a museum shelf. While this is not the career he'd pictured for himself, he still finds challenges. Quickly running out of new and unexplored regions to visit, he decided to resurvey areas and found a decline of 20–60% of the animals previously documented in those areas. Gaining access to a new fully protected and never surveyed area, he found only seven species of frog, an abysmal number and certainly far fewer than one would expect that habitat to support. Natives of the area were able to describe frogs that had inhabited the site with great detail, but no one could find them. In that case, Joe was even too late for forensic taxonomy.

The magnitude of these declines is hard to describe, but Joe compared it to every species of hawk going extinct in just months. If this catastrophe had happened to a group of mammals or birds, or even fish, it would be getting much more attention and much more funding. Dr. Mendelson called for more study, but recognized that many of the species in peril don't have the luxury of time. We cannot eliminate and can barely control fungus in corn, one of our major food sources. Joe thinks that trying to control it in wild populations of amphibians, while worthwhile research, will probably be ineffective. Recent studies show the possibility of a genetic link to resistance to the fungus. Breeding resistant animals in captivity and releasing those into the wild may be the last hope for some of these animals.

Dr. Mendelson left us with these actions that will help and that all of us can do. Take care of the planet. Continue to spread the word about the amphibian crisis through our educational shows. Continue to be responsible owners. And something perhaps many of us don't think about, involve yourself in the solution by documenting your successes. Publish your breeding successes so others may learn from them and record your field findings so the data is there to be interpreted if needed. And of course, as always the biological sciences are chronically underfunded. Join organizations such as Amphibian Ark (it's free). Contribute money if you can.

Lastly we saw a picture of the real Kermit the Frog between an Amphibian Ark representative and a representative of the AZA. They were addressing congress about the crisis. Joe said that it would be easier to get President Obama to your back yard barbeque than get the real Kermit anywhere, but Kermit made a tremendous hit with the representatives or as Joe described them, " . . . famously busy, preoccupied, uncaring, soulless people . . . " who lined up to have their pictures taken with the real Kermit the Frog. Let's hope that they also absorbed Kermit's message, "It seems to me that if you wait until the frogs and toads have croaked their last to take some action, you've missed the point." It's that challenge that keeps Dr. Mendelson dedicated to finding a solution. You can help. If those of us who care about these animals aren't involved, who will be?

This truly amazing treefrog *Ecnomiohyla rabborum*, not named until 2008, is already extinct in the wild and, as of the morning of the meeting, only two males were alive in captivity. Photograph by Brad Wilson.

The announcement reproduced below first appeared in Volume 1, Number 1, of The Chicago Naturalist, *published in April 1938 by the Chicago Academy of Sciences. As a result the first incarnation of the Chicago Herpetological Society was formed, and persisted until sometime in the 1950s. Our current version of the CHS was not founded until 1966, and is a completely separate organization. In 1991 Stephan Swanson, Director of The Grove National Landmark in Glenview, Illinois, sent us a photocopy of this announcement along with a note to the effect that he thought it might be of interest to CHS members. Just recently the envelope surfaced from under the clutter on my desk. Since I agree that it's an interesting bit of history, here it is.* MAD

Meeting of Amateur Herpetologists

The need for amateur groups in many fields of study is being called to our attention more and more by the increasing number of queries received at the Academy and other Chicago institutions of similar nature. It is our hope to encourage as many of these various interests as possible and to assist in the organization of small groups of amateurs interested in various fields of natural history.

The increased interest in reptiles—or more properly the additional signs of interest—since the conversion of the Lincoln Park Aquarium into a Reptile House, and the appointment of E. Gustav J. Falck as Curator of Reptiles in the Park, has made us more conscious of the need for a clearing house for ideas and the advantages of the added interest and enthusiasm to be obtained through intercourse of people with the same hobbies.

At the invitation of Walter L. Necker of the Academy staff, and E. Gustav J. Falck of the Reptile House, there will be an informal gathering of people interested in field or terrarium studies of reptiles and amphibians Thursday evening May 26 at 7:30 P. M. in the auditorium of the Academy. Everyone interested is invited to attend and to contribute ideas or exhibit photographs or specimens. We particularly invite those who may care to bring with them any of their animals, but we should like them to make previous arrangements with Mr. Necker at the Academy, either personally or by mail, so that proper space may be reserved.

There will be no special program, except that short talks of about ten minutes each will be made by representatives of various local institutions who are in a position to aid terrarium friends in one way or another, as are the staffs of the museums and zoos so that they will be better known to local amateur naturalists. Among the speakers will be Dr. Howard K. Gloyd, Director of the Academy, and Walter L. Necker, also of the Academy, E. Gustav J. Falck, Curator of Reptiles, Lincoln Park Zoo; Karl P. Schmidt, Field Museum, A. S. Windsor, General Biological Supply Company, and others. It is hoped, however, that the principal benefit to those attending will be meeting with fellow-terrarium-fanciers, and the consequent mutual interchange of ideas and problems—and perhaps specimens. We invite special requests, in the way of questions, which may be answered during the semi-formal addresses or afterwards individually.

If sufficient interest is aroused in the continuance of regular meetings devoted to various phases of the study of reptiles and amphibians, we shall be glad for suggestions leading toward a more formal and permanent organization.

Herpetology 2011

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

BAD JUJU

T. M. Doherty-Bone et al. [2011, The Herpetological Bulletin (116):19-24] note that the limbless and mostly tropical and soil-dwelling caecilian amphibians (Gymnophiona) are an extremely poorly known vertebrate order. Some species sometimes occur in agricultural settings, where being mistaken for earthworms or snakes and their accidental and purposeful killing are almost the only human cultural interaction yet recorded. *Crotaphatrema lamottei* is a caecilian endemic to the top of Mount Oku, Cameroon, and is poorly known scientifically, with only eight specimens ever having been recorded. Fieldwork in 2008 aimed at finding *C. lamottei* included interviewing people of the native, traditional Oku community who encounter this species while working the soil. Oku people recognize *C. lamottei* and consider it, along with other soil-dwelling vertebrates (Kefa-ntie), harmful to encounter but bad juju to kill. Oku people tainted by encountering *C. lamottei* seek a cleansing potion from a medicine man. The potion is produced in a traditional multi-person ceremony, and is made from ground herbs, palm oil and chicken blood. It is administered by being smeared on the base of the tainted person's thumb and licked off. Following the acquisition of the potion, more *C. lamottei* were presented to the field team by members of the Oku community. Understanding local perspectives can be helpful when researching rarely encountered and poorly known species.

INTERACTIONS WITH ROADS

J. D. Rouse et al. [2011, Copeia 2011(3):443-456] maintain that the ability to predict the effects that new or modified roads will have on species or populations of conservation interest is critically important to protection efforts. They documented patterns of movement and spatial dispersion of two sympatric snake populations by radiotracking 34 eastern massasaugas (*Sistrurus catenatus*) and 13 eastern hog-nosed snakes (*Heterodon platirhinos*) over four years. The two species differed substantially in their movements (frequency, rate, tortuosity, distance) and ensuing spatial dispersion. Regardless of species, males were more vagile than female conspecifics during the mating season. The primary factors hypothesized to have generated the interspecific differences in movement and spatial dispersion were foraging mode, mating system, and reproductive mode. By combining their understanding of how these snakes used space with knowledge of their natural history and ecology, the authors examined which attributes of their spatial ecology might render *S. catenatus* and *H. platirhinos* most susceptible to road effects. For *S. catenatus*, observations suggest that spatial fidelity and space use relative to hibernacula are the primary factors influencing the species' susceptibility to road effects. For *H. platirhinos*, tortuous and extensive movements, space use relative to hibernacula, and large spatial dispersion distances from hibernacula are likely the most important factors.

SALAMANDER GUTS HOLD ANTIFUNGAL BACTERIA

P. J. Wiggins et al. [2011, J. Herpetology 45(3):329-332] note that *Janthinobacterium lividum*, a bacterium that inhibits the growth of the lethal amphibian pathogen *Batrachochytrium dendrobatidis*, has been found in myriad environments, including the skins of amphibians that resist the fungus. They present evidence that the gastrointestinal tract of *Plethodon cinereus*, the eastern red-backed salamander, can serve as a reservoir for *J. lividum*. Two of six individuals collected from a natural environment harbored *J. lividum* in the gut tube. Violacein, whose intense violet color allows for rapid visual detection and chemical analysis, served as a first indicator for the presence of *J. lividum*. This secondary metabolite of *J. lividum* was confirmed through reverse-phase high performance liquid chromatography, UV-Vis analysis, and high-resolution mass spectrometry. The identity of *J. lividum* was confirmed by PCR amplification with *J. lividum*–specific primers of DNA extracted from the isolated bacteria. Because *J. lividum* survives in the digestive tract, it will likely be inoculated onto skin around the cloaca and into the soil and indirectly onto salamander skins. Thus, the gut may act as an important reservoir for this antifungal bacterium.

HABITAT USE BY ARROYO TOADS

M. J. Mitrovich et al. [2011, J. Herpetology 45(3):319-328] note that information on the habitat use and movement patterns of arroyo toads (*Anaxyrus californicus*) is limited. The temporal and spatial characteristics of terrestrial habitat use, especially as it relates to upland use in coastal areas of the species' range, are poorly understood. The authors present analyses of radiotelemetry data from 40 individual adult toads tracked at a single site in coastal southern California from March through November of 2004. They quantify adult arroyo toad habitat use and movements and interpret results in the context of their life history. The analysis shows concentrated activity by both male and female toads along stream terraces during and after breeding, and, although fall sample size is low, the continued presence of adult toads in the floodplain through the late fall. Adult toads used open sandy flats with sparse vegetation. Home-range size and movement frequency varied as a function of body mass. Observed spatial patterns of movement and habitat use both during and outside of the breeding period as well as available climatological data suggest that overwintering of toads in floodplain habitats of near-coastal areas of southern California may be more common than previously considered. If adult toads are not migrating out of the floodplain at the close of the breeding season but instead overwinter on stream terraces in near-coastal areas, then current management practices that assume toad absence from floodplain habitats may be leaving adult toads over-wintering on stream terraces vulnerable to human disturbance during a time of year when arroyo toad mortality is potentially highest.

Unofficial Minutes of the CHS Board Meeting, October 14, 2011

The meeting was called to order at 7:43 P.M. at the Schaumburg Public Library. Board member John Archer was absent.

Officers' Reports

Recording Secretary: Cindy Rampacek read the minutes of the September 16 board meeting, which were accepted as read.

Treasurer: Andy Malawy shared the financial report from September and clarified one item. Bob requested a reimbursement of the costs incurred from the relocation and transport of the rescued crocodilians he had accumulated. Jenny moved to reimburse Bob Bavirsha for expenses incurred during relocation of the crocodilians to Alligator Adventures in South Carolina. Mike Dloogatch seconded the motion and it passed unanimously.

Membership Secretary: Mike Dloogatch read a list of memberships expiring this month.

Sergeant-at-arms: Greg Brim reported that there were 44 people at the September meeting. He also asked that the members-at-large stick around afterwards to discuss this year's awards presentation.

Corresponding Secretary: Deb Krohn reported that AT&T sent us a credit of $ .07 and the account is now closed.

Publications Secretary: Aaron LaForge has updated the web site with the upcoming speakers. He is working on fixing the Amazon.com link. A discussion ensued on calendars. We will do a bit of research and revisit in November. Jason suggested we look at getting more content hosted on the site to make it more dynamic. The ReptileFest pages are temporarily down.

Committee Reports

Shows:
• Notebaert, first full weekend of each month
• Great Lakes Pet Expo, February 4, 2012
• Reptile Rampage, Lake Forest, March 11
We had a great turnout at our NARBC booth and the traffic seemed much more steady compared to last year. A great thanks to Bob Ashley and Brian Potter for allowing the CHS to be part of the event. Andy will reimburse admission fees for those who worked the booth.

ReptileFest: New business cards are ready.

Nominating Committee: Slate was presented at the September 28. Additional nominations are being accepted from the floor

Old Business

CHS merchandise: We need to collect T-shirts and other items now stored at the Hoppenraths'.

Holiday Party: Cindy Rampacek moved that we allot $250.00 to Deb Krohn to purchase food for the holiday meeting. Linda Malawy seconded and the motion passed unanimously.

New Business

ReptileFest business cards were handed out at the meeting. This year's cards feature native herps.

December board meeting will be held at Deb's house.

Grants: Mike will announce the 2012 grants program in the October *Bulletin*.

Round Table

Mike Dloogatch had a couple of things. He is getting sick and tired of being the only CHS person at the Midwest Herp Symposium. He'd like to see others attend next year. In looking at the North Carolina Herp Society minutes he noticed that each board member had a "continuity folder" that they passed on to the next position holder. He thinks it is a great idea but doesn't know its practicality for our group.

Greg Brim saw 20 different species last weekend herping and got about 20 chigger bites. The rough green snake was a first time species for him and they saw a ton of cottonmouths.

Bob shared his adventures transporting 'gators to South Carolina.

Cindy again thanked Brian Potter and Bob Ashley and the entire NARBC Staff for their hospitality to the CHS at the show in Tinley. She also shared her auction donation of the brownie.

Deb mentioned her husband enjoyed the last *Bulletin* with the stories of the snake escapes.

Lawrence said his eggs are doing well, but then he clarified that they were not his but his gecko's.

Mike Scott would like to see us get more people out to work the CHS booths at events. He feels people may get bored with just the same people working and we need to reach out more.

Dick said the tour was just awesome at the St. Louis Zoo. The keepers and staff were amazing and very gracious. A huge thanks to Mark Wanner for setting us up and keepers Chris and Matt rocked as hosts.

Jason found someone who is breeding *Pseustes sulphureus* in the U.S. He and Gavin picked up a group of 4.4. Barbara's jewelry did great at NARBC as well.

The meeting was adjourned at 9:40 P.M.

Respectfully submitted by recording secretary Cindy Rampacek

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, PO Box 430, Newberry, FL 32669-0430, 352-472-9189, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. Our mice and rats are vacuum-packed to greatly extend freezer life by reducing freezer burning and preserving vitamin and nutrient content. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. For a complete price list please visit our web site, www.themousefactory.com. We accept all major credit cards, PayPal or money orders. Call us **toll-free** (800) 720-0076 or send us an e-mail at info@themousefactory.com. Write us at PO Box 85, Alpine TX 79831.

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

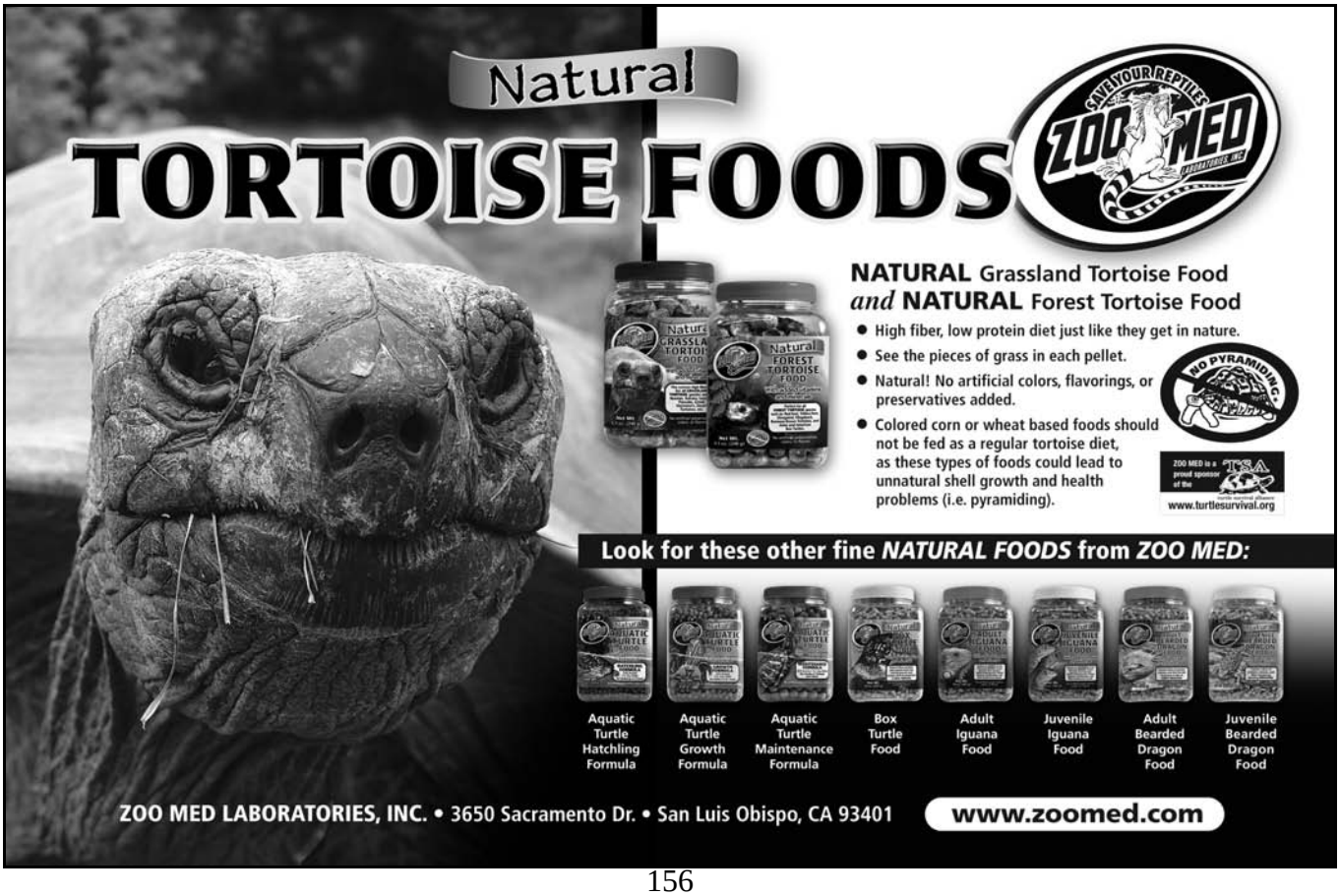
For sale: This is not a last chance, but it's a good time to buy a copy of *The Golden Age of Rattlesnake Hunting*. Here's what some people have said about it: "May the book receive the hearty enthusiasm it deserves. . . ."—Hobart Smith; "I never knew you got a kick out of catching big ones alive."—Roger Conant; "Buy my dad's book."—Greg Wheeler; "An intriguing book . . "—Bob & Sheri Ashley; "I've read it twice and I'll read it again."—Bill Peterson; "Buy my dad's book."—Don C. Wheeler. If you've decided you've got to have it, send $12 check, cash or money order to Don Wheeler, 2705 Sunset Trail, Riverwoods IL 60015.

For sale: Australian herp publications: *The Taipan—The World's Most Dangerous Snake* by Paul Masci and Philip Kendall, 1995, 90 pp., many color and b&w photos, tables, comprehensive treatment including snakebite case histories and biology, softbound, $65; *The Cold-blooded Australians* by Gunther Schmida, 1985, 208 large pp., over 280 excellent color photos, a unique photographic study of Australia's reptiles, amphibians and freshwater fish organized by drainages, spectacular photos, some full-page, of seldom photographed species, hardbound, $40; "Red-bellied Black Snake" by Rick Shine, 12-page article in April/June, 1997 issue of *Australian Geographic* with l4 color photos, includes results of Shine's research on this species, written in his humorous style, $19; "True Blue" by Geordie Torr; 16-page article in July/Sept. 1999 issue of *Australian Geographic* with 29 color photos; an account of the 6 Australian bluetongues with detailed information on the shingleback's life history and the discovery of the pygmy bluetongue, $19. *Australian Geographic* is the journal of the Australian Geographic Society. Each 128- to 141-page issue contains a half dozen feature articles on mainly Australian subjects. Articles are written by authorities and are handsomely illustrated with excellent color photos. All publications are in excellent condition. $3 postage and handling for orders under $25, free for orders over $25. William Turner, 7395 S. Downing Circle West, Centennial CO 80122; (303) 795-5128; toursbyturner@aol.com

For sale: Trophy quality jungle carpet, diamond-jungle, and jaguar carpet pythons. Website: moreliatrophyclub.com E-mail: junglejohn@tds.net.

Herp tours: **Costa Rica herping adventures**. Join a small group of fellow herpers for 7 herp-filled days. We find all types of herps, mammals, birds,and insects, but our target is snakes. We average 52 per trip, and this is our 10th year doing it. If you would like to enjoy finding herps in the wild and sleep in a bed at night with air-conditioning, hot water and only unpack your suitcase once, instead of daily, then this is the place to do it. Go to our web-site http://hiss-n-things.com and read the highlights of our trips. Read the statistics of each trip and visit the link showing photos of the 40 different species we have found along the way. E-mail at jim.kavney@gmail.com or call Jim Kavney, 305-664-2881.

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to mdloogatch@chicagoherp.org.



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UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, November 30, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. This meeting will include the annual election of officers and members-at-large of the CHS Board of Directors. And we'll have an interesting program as well. The program will deal with a gopher tortoise that **Karen Furnweger** adopted through the CHS. The tortoise was extremely fortunate that Karen adopted it, but had been poorly cared for prior to being given up for adoption. **Dr. Sue Horton** and veterinary technician **Erica Livingston**, both of the Chicago Exotics Animal Hospital, will tell the story along with Karen.

The December 28 meeting will be a holiday party. The CHS will provide soft drinks and snacks. If you would like to bring something edible to share with the group, you are invited to do so. If you would like to bring an animal to show off to the group, you are encouraged to do that as well. This will be a chance to socialize all evening and get to know your fellow members a little better.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

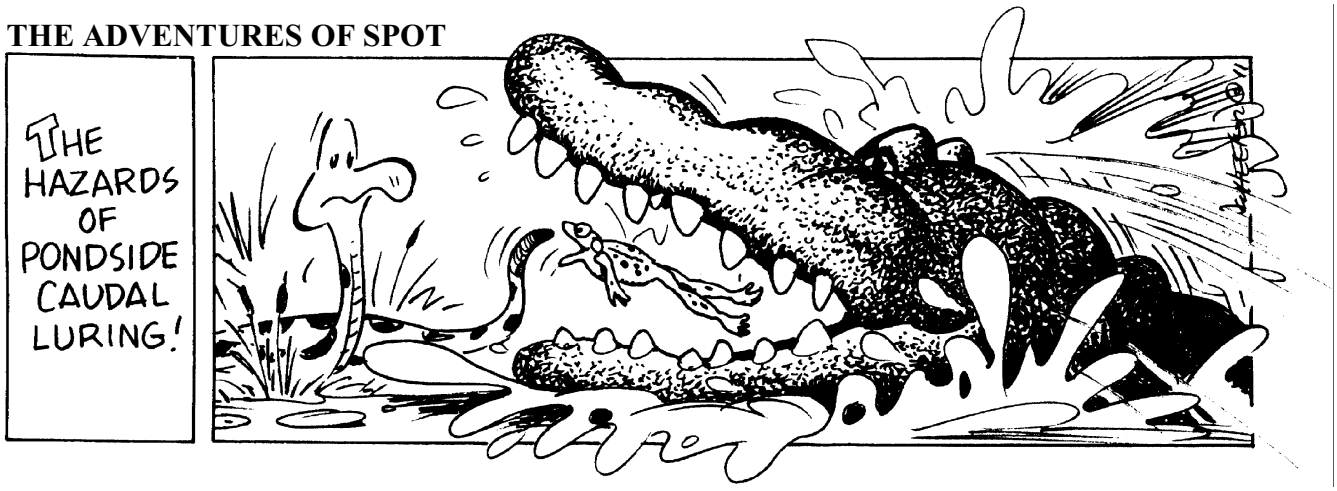
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the next board meeting, to be held at 7:30 P.M., December 16, at the home of Deb Krohn in Grayslake. If you wish to attend, please call Deb at (847) 281-7124.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info visit the CTC website: http://www.geocities.com/~chicagoturtle.

THE ADVENTURES OF SPOT



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