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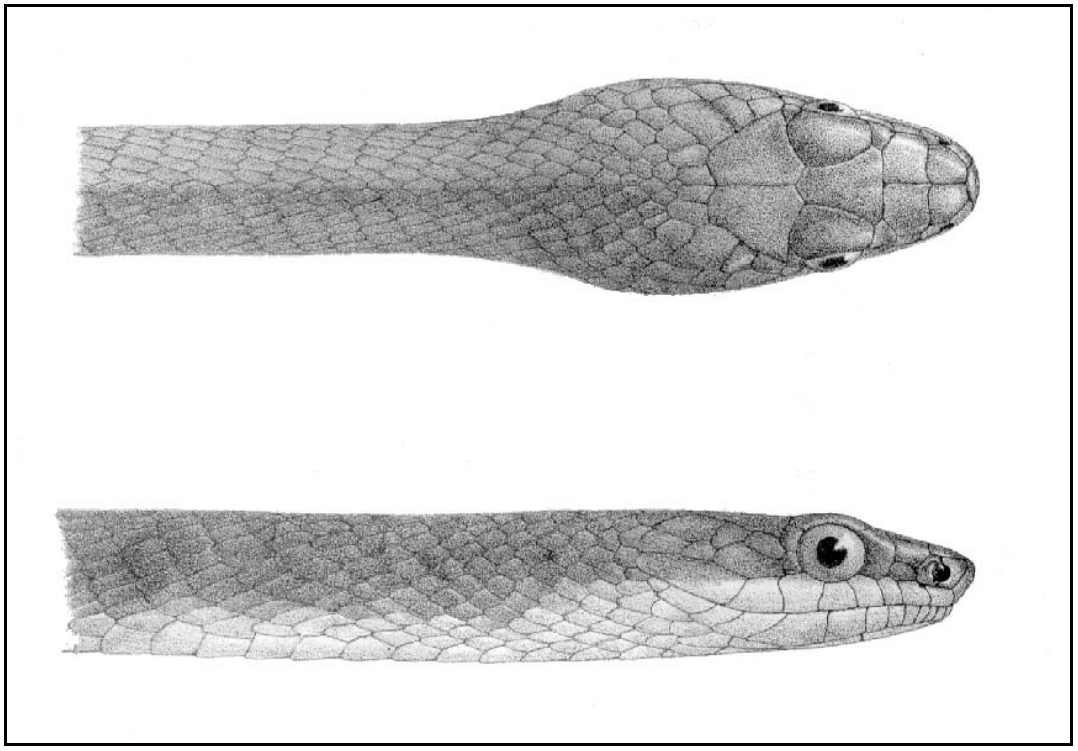

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Cover: Puffing snake, *Pseustes poecilonotus polylepis*. Drawing (as *Phrynonax eutropis*) from *Catalogue of the Snakes in the British Museum (Natural History). Volume II., Containing the Conclusion of the Colubridae Aglyphae* by George Albert Boulenger, 1894.

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Snake Escapes, Education, Speculation and Colleen Kelly: A Discussion

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Part 1. How Did That %$&#@! Snake Get out of Its Cage??!!

The recent escape of an Egyptian cobra (*Naja haja annulifera*) from the Bronx Zoo received widespread media attention (e.g., several related skits on *Saturday Night Live*, numerous reports on CNN and other news outlets). I had little doubt the specimen would turn up, because in my experience with non-venomous and venomous snake escapes over a 47-year period at my home and the two zoos (San Antonio and Houston) I worked at, I (and my fellow keepers) found the vast majority of the escaped specimens; in fact, I only remember one escaped venomous snake (a Rowley's palm viper, *Bothriechis rowleyi*), that we never recovered. I suppose the reason we never found him was because palm vipers are more of a 3-dimensional habitat occupying type of snake. The Houston Zoo has a lot of large, attractive oak and other trees throughout; there was little chance we'd be able to locate an 18" green (with blue flecks) palm viper sitting 30 feet up in an oak (or other) tree. Since Houston summers are much warmer (and winters cooler) than those of the pine-oak/cloud forest habitat where Rowley's palm vipers are found (Campbell and Lamar, 1989, 2004), I doubt this specimen lived very long. (Assuming it did indeed get out of the amphibian and reptile building to begin with, which I think is a fair assumption. If it didn't, then there's a very dehydrated, colorful corpse somewhere in the building.) Bad for the snake, but good for us, since we would have been in the uncomfortable situation of having to explain how a palm viper happened to be crawling around Houston, Texas, had it been found by anyone other than us. Since it was a very rare species in captivity at the time, with the only captive specimens being at the zoo and my home, we couldn't have explained its presence by claiming it was someone else's escaped "pet" snake. Sometimes you can get away with that, as you'll see below.

The stories behind some of the escapes I've seen over the years are, in my view, pretty interesting, and while some of the specific details are kind of hazy, the most relevant ones are pretty clear in my memory. Following is a discussion of some of the most interesting escapes and recaptures, all of which occurred at the Houston Zoo or at my home in Houston.

Honduran milksnake (*Lampropeltis triangulum honduriensis*): An adult male escaped from an aquarium in the reserve (off-exhibit) section, and while I don't remember how long it was before he was seen, seen he finally was. The Houston Zoo had an indoor bird aviary, and he took up residence among the rocks and lush vegetation on the floor of the exhibit. He seemed to feel right at home, because in spite of repeated attempts to catch him, he never left his comfortable new home. (Snakes in the wild sometimes avoid an area where they are disturbed for long periods of time [e.g., Brown, 1992; 2008], and rattlesnakes placed in a new enclosure at my home often exhibit increased hiding/reduced basking behavior [pers. obs.]; maybe the reason he stayed where he was being disturbed a whole lot was because he was a long-term captive, and thus well-habituated to people messing with him [being a kingsnake, he was used to being yanked out of his cage virtually every day for cleaning, unlike my rattlesnakes at home, which I disturb as little as possible.]) We suggested to the staff of the bird department they simply let him continue living there, since he seemed so pleased with his new environment, and his presence certainly made for an interesting mixed-species exhibit. (He frequently came out during the day, and the public was quite impressed with his beauty [he was a tangerine-phase specimen].) They did not find any merit (or humor) in our suggestion at all. While we thought he was probably eating the numerous feral, brown house mice attracted to the banquet (fresh fruits, vegetables and grains) prepared daily for the many bird species in the exhibit, they were convinced he was eating their birds. They accused us at one point of not really trying all that hard to catch him (enough time has passed, so I'll plead guilty as charged), but seeing as to how he zipped off into the dense ground cover as soon as we approached him, it was hard to get near him even when we really were trying to catch him. (The floor of the exhibit was not designed with capturing loose milksnakes in mind.) But we finally did catch him, and peace was restored between the amphibian/reptile and bird departments.

California kingsnake (*L. getula californiae*): While most of the snake taxa I maintained at home were palm vipers (*Bothriechis* spp.) and montane rattlesnakes (*Crotalus* spp.), I did have a lone desert phase California kingsnake and a few other non-venomous snake species. The California kingsnake managed to get out of his cage (a well-known kingsnake ability) and I figured he was gone for good. (Rattlesnakes and other pitvipers and true vipers are very forgiving of one's carelessness, by contrast. They will sit for hours, or longer, and never discover an open cage lid/door.) Some of my neighbors around the corner and down the street (about 100 yards total distance) began seeing him in their yards and asked me what kind of snake it might be. (They knew I worked at the zoo and had snakes in my house.) I resorted to the "It sounds like an escaped California kingsnake, which is a commonly-kept 'pet' snake species" explanation, and I figured he would eventually be captured or killed, or would eventually disappear. I don't remember how much time went by, but my general impression is about two months or so after he escaped, I walked into my downstairs cool room (which housed some of my palm vipers and montane rattlesnakes), and I found a pile of fresh snake feces on the floor (curiously almost dead center in the room). After checking to ensure nobody in that room was missing from their cage, I had an "Aha" moment and realized the California kingsnake had "come home." (Right house but wrong room; he escaped from a cage in one of my two upstairs warm rooms.) I located him in a closet where I stored bags of cypress bark mulch.

Yucatan ratsnake (*Pseudelaphe flavirufa*): We had a pair of

these interesting tropical ratsnakes at the zoo we were fortunate enough to reproduce. I don't remember the exact clutch size, number of neonates that hatched, or even the number of neonates that escaped soon after hatching. However, I do remember one specimen very clearly.

About 3–5 years after the above-mentioned neonates escaped, we had a member of the public buzz our office. Two of us (myself and Keith Neitman, who went on to the Woodland Park Zoo in Seattle, Wa.shington) responded to the buzzer; in somewhat of an agitated state, this person told us there was a "big" snake in the roots of one of the many oak trees out in Hermann Park (in which the zoo was located). We asked him to describe the specimen, and smug in our knowledge of the local herpetofauna, we told him it was probably just a Texas ratsnake (*Pantherophis obsoletus*). However, something about his description (I don't remember what, but it was probably the snake's color) prompted us to walk out into the park with him to actually see the snake ourselves. As we approached the oak tree in question, we looked at the root bole (which we assumed he meant when he said "in the roots") and one of us asked, "Where's the snake?" He pointed at the ground and said "Right there!" We looked down, and saw he really meant in the roots. There was a small portion of coil visible amongst the tangled roots/dirt visible below ground level. We began uncovering it, and at first we thought it was a corn snake (*Pantherophis g. guttatus*) because of the snake's red blotches, but as we exposed more of it, we saw it was an adult (about 3.5') Yucatan ratsnake. I was stunned. It had to be one of the neonates that had escaped years before and grown up in Hermann Park, which I never would have guessed was a possibility. Yucatan ratsnakes occur far south of Houston, Texas (i.e., in the Yucatan Peninsula of Mexico [Lee, 1996]), and Houston winters are far colder than those of the Yucatan Peninsula. Beyond this, Hermann Park is a typical big city, well-manicured park; the only close-to-natural habitat available to a wandering Yucatan ratsnake was up in the oak and other tree canopy. I guess as a neonate it may have fed on green anoles (*Anolis carolinensis*), which occurred in the park but were not real common, and then found mice/birds to eat as it grew in size, but I was hugely impressed with the snake's survival. Invasion biology (e.g., Covacevich and Archer, 1975; Jiang et al., 2010; King and Krakauer, 1966; McKeown, 1978; Oliver and Shaw, 1953; Petren et al., 1993; U.S. Congress, 1993; Wilson and Porras, 1983) has always been an interest of mine, because any introduced specimens have, depending on a number of factors, potentially significant challenges to overcome merely to survive, let alone the establish a reproducing population. (The term "invasion biology" is a general term that includes a reproducing population of an introduced species; the instances I discussed above are examples of "waif" specimens following the terminology of Hulse [1980], which are "introductions of single specimens or two or more specimens of one sex in any area.") Hopefully not flying too far off the rails of speculation (see Part 2), I think events like the above California kingsnake and Yucatan ratsnake escapes/survival hint at some interesting possibilities regarding the taxa in question. For example, their survival navigating in an utterly novel environment following escape could indicate a high degree of plasticity regarding acceptable microniche/niche conditions, or could even indicate a certain degree of intelligence relative to other snake species as well as other vertebrates. Reptiles do exhibit the ability to learn and remember, in some cases learning maze navigation at rates approximating those of rats (Brattstrom, 1978; see also Regal, 1978, and Abramson and Place, 2008, for more general discussions of reptile cognitive abilities), and I don't think it is beyond reason to suggest the ability to learn, remember, and then utilize novel textures/scents to successfully navigate in an alien environment could be indicative as a measure of intelligence.

Mandarin ratsnake (*Euprepiophis mandarinus*): We had some mandarin ratsnakes at the zoo, and one of the people I worked with, Paul Freed, had also obtained some specimens for his personal collection. This was back when nobody could keep mandarin ratsnakes alive for very long (a common rumor was that their gall bladders were surgically removed prior to exportation), let alone reproduce them, so the zoo and Paul loaned me their specimens so I could hopefully figure out their captive husbandry requirements. (Paul Freed traveled to many countries over many years collecting amphibians and reptiles as part of his interest in parasitology [ecto-and endo-]; his experiences were documented in an interesting book that is still available [Freed, 2003]. He was very generous in loaning me many virtually impossible-to-obtain species I had interest in, both from an ecological and captive husbandry perspective.) So I took the mandarin ratsnakes home, and based on the little published data regarding their natural history, I came up with a husbandry protocol that began with sticking them in my cool room.

I had long, narrow, screen-topped aquariums built to house them individually since they were obviously nervous, easily stressed snakes. I had about 8" of a peat/sphagnum moss mixture in each cage, which I kept damp to allow them to burrow and dig underground shelters in, which they did. I initially provided a basking site by directing a spotlight at flat rocks in each cage. While I doubted they would bask on top of the rock (and they didn't), I thought they might bask under the flat rock (which I never saw). I finally stuck a ceramic heat plate against one end of each aquarium thinking they may use that. I almost never saw any of the specimens; in spite of going in the cool room all hours of the day and night, I saw them above ground only a few times, and when they saw me, they disappeared into their burrows. They did not like the inbred lab mouse strain the zoo bought as amphibian/reptile/bird food, but they did sporadically eat pink/fuzzy rats, and one specimen ate a green anole on one occasion. However, when I offered them the athymic, heterozygous nude mice (which did have fur) which I got from a local cancer research foundation to feed my own specimens, they began feeding voraciously. (I have noticed on other occasions snake preference for a particular inbred lab mouse strain.)

At the time, I was aware of only one other group of mandarin ratsnakes anywhere that were doing halfway well. They were at Bill Gillingham's facility in California, and while it may seem a little silly, I wanted to have the first captive breeding. He beat me to it (Gillingham, 1990), but I did have the second captive breeding. (The title of his paper is "The First North American Breeding . . . " but as far as I was able to determine, his was the first captive breeding anywhere.)

At one point, I compromised my hoped-for success by letting a big, beautiful male escape. I of course looked for him, but the apartment I was living in was anything but escape proof, and because the back yard had a dense ground cover of ivy, I didn't think I'd ever see that snake again (even assuming he stayed close by; I figured a fossorial snake would be in snake heaven in dense ivy). So much time went by I thought he perhaps had made his way to San Francisco and set up home in Chinatown (where maybe he smelled something that reminded him of home), or even hopped onto a freighter and headed west. (I once searched for a roughly 12-foot-long reticulated python [I found its shed skin, but sadly not the snake itself, which was later killed] in the hold of a freighter loaded with pipe at the Port of Houston that had come from Asia, so snake travel the other direction was a possibility!)

But then one night I walked outside to feed the slugs that lived under my porch (Houston has some neat, big slugs that eat dry cat food and provide hours of entertainment for the socially deprived), and to my astonishment I saw him crammed into a crack in my rickety wooden porch. And again I was very impressed that a snake from a very un-Houston like climate (let alone a radically different physical environment) had lived and thrived (he had great body weight) during its period of freedom.

Egyptian cobra (*Naja haja annulifera*): Yup, we had our own Egyptian cobra escape. We had an adult (and feisty) female roaming around for maybe 3–4 weeks, and we spent a lot of time, both day and night, looking for her. It is a really, really bad feeling to have such a highly venomous snake loose, and I don't think any of us would have minded having her latch onto any of us, as long as that meant finding her. We always kept an eye on the doors going from the keeper area into the public area to ensure no substantial gaps existed, but it is amazing how small a gap a snake can squeeze itself through. (A rough guide is this: Look at your snake, and try to envision how tall the largest vertebra is at midbody. Then look at the gap(s) in question. Years of forensic examination of snake escapes have led me to the conclusion that snakes can squish their heads far flatter than seemingly possible, and thus the limiting factor regarding the size of gap a snake can get through may be whether the gap is narrower than their largest vertebra is tall. This implies a mechanism that "tells" a snake that "If your head is this squished, then you cannot get through this gap," which I admit sounds pretty far out. But their heads are real squishy, their ribs can flatten out, but their vertebrae are a fixed size.) We did not close the building, because abundant (way too abundant) experience told us it was highly unlikely our escaped cobra would be found in the public area, let alone outside the building. This was back when John Werler (a real animal person, with an emphasis on amphibians and reptiles) was zoo director, and he was comfortable with using his own, and our, judgment with escaped snake behavior as opposed to panicking on a worse-case scenario basis, closing the building, and alerting the media. Those were good old days.

One of the other people I worked with for years (John McLain, who eventually left the Houston Zoo for the San Antonio Zoo) at the zoo was a nightwatch person at the time, and because he had experience working with venomous snakes, he was the only non amphibian/reptile department employee tasked with looking for her at night. And he was the person that found her one night crawling up a wall in one of the keeper areas.

The same female produced a clutch of around 11 eggs, and all her offspring inherited her love of escape, travel, and adventure. Because reptile embryos' oxygen needs increase throughout incubation as they develop (e.g., Packard and Packard, 1994), and logically peak right before/during hatching, someone did the right thing (left the shoebox lid the eggs were incubating in ajar to increase the oxygen level) to the wrong degree (just a little too ajar!) at the end of incubation. The shoebox was in a nice, well-sealed (with a stout gasket and strong latches) bacteriological incubator we used for egg incubation; it was designed to keep bacteria from going in and out, so we thought it was capable of keeping neonate snakes in, even if they escaped their shoebox. But we thought wrong, and the neonate cobras all happily crawled out of the incubator.

Again, we did not close the building, and none of them got into the public area (at least none were found in the public area). None of them left the building (although they easily could have if they had wanted to, but none were found outside either), and over a period of time, one would show up here, and one would show up there. The last escapee was found in the sink in the reserve area they escaped into I don't remember how many weeks later.

In some of the above cases, and in many other cases I haven't discussed, I was struck also by the fidelity of the escaped snake to the area from which it escaped. And to reiterate, I have long been impressed by how well some escaped snakes have done upon leaving their "home range" (their enclosures) and finding themselves in an utterly novel habitat. Numerous studies have shown that relocated snakes (and other vertebrates, including mammals) generally fare poorly when released into new (but composed of the same kinds of vegetation, soil, prey species, etc.) areas (e.g., Brown et al., 2008; McCrystal and Ivanyi, 2008; and references therein); to me it's very interesting an escaped snake like the above California kingsnake can do so well in an environment full of novel substrates/odors/vibrations/sights in comparison with taxa discussed in studies of specimens relocated in the wild. And I further wonder why that California kingsnake returned to my house. Did he get to some "default" point that told him life was better from where he began his journey, so it was time to stop "exploring" and return "home"? I think it's safe to posit that he had some kind of "reason" to return (as opposed to randomly crawling around for who knows how long bumping into and off of things, and ending up in my downstairs warm room purely by chance), and whatever his motivation, I think it does raise some interesting possibilities about the snake mind. (I envisioned how I'd react if I suddenly ended up in a novel environment, like if I were dropped onto the surface of another planet. I might be tempted to go out and explore to see if I could find a better place than the one I was dropped onto, but if I was unable to locate a better place, I'd go back to the place closest to where I did remember having access to food, water, and shelter. I know this is extremely anthropomorphic, but what the heck. It's not against the law to speculate.)

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Aside from the above reasons for writing this discussion, I had one additional reason in mind. There has lately been increased discussion of the various theoretical threats escaped non-venomous and venomous snakes represent (i.e., threat to human life/threat of additional established populations of non-native species and their threat to native ecosystems), and I think my above discussion is relevant to these subjects as well.

In the last 25 or so years, various legislative bodies (local, state, and federal) have considered or implemented legislation restricting/banning the possession of non-native amphibian/reptile species, with an emphasis on non-native venomous snakes. The states which have not banned the possession of non-native venomous snakes have, in some cases, implemented modes of control such as the purchase of permits/licenses (which I have no objection to) as my home state of Texas has done. While I can understand the various concerns that have been voiced regarding the possession of highly venomous snakes like mambas (*Dendroaspis* spp.) and taipans (*Oxyuranus* spp.), I do not support blanket legislation banning the possession of any snake species. I grant that it's conceivable that a captive, highly venomous snake could escape and bite a member of the public, but I am unaware of a single instance of this ever happening anywhere in the United States (if anyone is, please email or mail me the data). And while I above discussed a few instances of non-native snakes doing surprisingly well upon escape from captivity, those snakes escaped into urban areas without non-human snake predators (with the exception of dogs, cats, and maybe owls), and again, the vast majority of snake escapes I have direct knowledge of resulted with the capture of the escaped specimen. But the scenario of an escaped, gravid elapid snake species establishing a reproducing population somewhere is a real (however remote) possibility, and it's easier to say "Ban them all" instead of applying a little reason to this issue. I do not want to see my ability to continue maintaining the taxa I'm most interested in (montane *Crotalus* species, including Mexican forms) legislated out of existence due to fear of them escaping and becoming established in Brewster County, Texas, and I don't think such a ban is warranted here or anywhere else. Again, while it is a remote possibility a non-native (or native) venomous snake could escape and bite a member of the public, I am not aware of this ever happening anywhere at any time, and if humans stopped doing anything remotely dangerous because of fear of the worst case scenario, we wouldn't get married, we wouldn't drive cars, ride bicycles/motorcycles, eat certain types of fatty foods, jump out of airplanes, take a shower/bath at home, etc. But maybe a critic would insist I have to come up with a more compelling reason than this (i.e., my "right" as an individual versus the need to protect the public) to justify me keeping my non-native venomous snakes, no matter how remote the danger to the public.

One other justification for me (and others) keeping venomous snakes involves my (and others) potential contributions to science. Captive specimens are potential sources of all kinds of scientific data, and I have (and I know others have as well) collected and published such data obtained by observations of captive specimens. For example, I have observed male-male and female-female combat and reproduction in my captive Gila monsters (*Heloderma suspectum*; not yet published, but I'm working on it) and I have observed and reported on husbandry, behavior, and reproduction in a number of my other captive specimens. But this "Service to Science" justification is not the one I feel is most important. I fully support allowing private individuals (zoos don't need my support; they have their own lobby, as do the most crass commercial interests) to maintain native and non-native venomous snakes and other taxa because of their potential value in education.

However, a counter to my "Value to Education" argument could be that any private individual interested in educating the public about venomous reptiles (native and otherwise) and other taxa can utilize a number of non-live animal resources (e.g., slides, video, written information, plastic models, preserved specimens, etc.) and I would have to concur in one respect. There is no difference in the rate of cognitive learning between live animal and non-live animal educational presentations. But, there is a huge difference in the potentially critical affective (i.e., how one feels/empathy) learning rate between non-live animal and live animal presentations: No affective learning takes place at all when non-live animal materials are used, but affective learning does take place when live animals are used in educational presentations (Sherwood et al., 1989). (Prior to reading this paper, I had an intuitive recognition of this; people seemed a lot more engaged when I showed them a live specimen as opposed to slides of the same, and others have noticed this effect as well [e.g., Carmichael (2008), who stated regarding audience exposure to a live specimen: "Making that intimate one-on-one connection does more than any words and activities can accomplish"].) And while I don't have any data to support this, I feel strongly that without affective learning, voters (conservation is ultimately a political issue) are less likely to support conservation concerns when they are pitted against economic concerns. That "love" of animals may be an important component regarding conservation concerns has also been alluded to by as luminary a scientist as Steven Jay Gould, who wrote (Gould, 1993):

> Yet I also appreciate that we cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well—for we will not fight to save what we do not love (but only appreciate in some abstract sense.) So let them all continue—the films, the books, the television programs, the zoos, the little half acre of ecological preserve in any community, the primary school lessons, the museum demonstrations, even (though you will never find me there) the 6:00 A.M. bird walks.
>
> Let them continue and expand because we must have visceral contact in order to love. We really must make room for nature in our hearts. . . .

Had he been aware of the data presented in Sherwood et al. (1989) I think he likely would have cited it, being the scientist and educator he was. I consider Sherwood et al. (1989) one of the most, if not the most, important scientific papers I have ever read because of its fundamental, critical relevance to animal education/conservation, and I am surprised (and dismayed) that it is still not cited very often in papers dealing with education efforts regarding animals. For example, Sasaki et al. (2008) did not cite it in their paper regarding the importance of education in rattlesnake conservation; had they been aware of it, maybe they wouldn't have emphasized their idea of utilizing Native American myths to promote rattlesnake conservation to the degree they did. (While I find Native American mythology concerning

rattlesnakes interesting, and even charming, I don't think substituting one set of myths [those of European-derived people] for another [those of descendants of the Asians who crossed the Bering Land Bridge into America] is the way to educate anyone about the importance of rattlesnakes as biological entities.) In the best example of rattlesnake education I'm aware of, and one which should serve as a model for all conservation efforts regarding venomous snakes, Odum and Goode (1994) described educational efforts on Aruba Island that changed people's perspective of the Aruba Island rattlesnake (*Crotalus durissus unicolor*) from one of fear to one of pride that their island is home to this endemic, threatened rattlesnake subspecies (with a banknote featuring the rattlesnake, and protected status accorded both for the rattlesnake and its habitat), and these efforts did not incorporate anyone's mythology.

As human populations expand unchecked, they're the invasive vertebrates that will continue to invade and destroy entire ecosystems at a rate far in excess to even the most dire xenophobic estimates of the threat posed by non-native amphibian and reptile (and other animal) species. To help counter this threat, conservationists need political (voter) support, and to reiterate, without affective knowledge, I think the average voter is far less likely to be supportive in the battles between conservationists and economic interests looming on the horizon. All a private collector needs to materially contribute to conservation efforts is her or himself, a live specimen, and an audience of one or more kids. (I emphasize kids because they are more open to learning about animals than the majority of adults in my experience [see also Bloom and Weisberg, 2007], which is not to say I think efforts directed at adults are a waste of time. If one's time is limited, then one should focus on kids.) Years ago, I saw first hand just how profound a difference such a simple encounter (educator, live animal, kid) can have education-wise.

At the end of a day collecting in Nuevo Leon, Mexico, I (then still at the Houston Zoo), Alan Kardon (San Antonio Zoo), and David Lazcano (University of Nuevo León, Monterrey) were in a little restaurant in the town of Galeana to have dinner. We had the day's collection of specimens with us to show them to anyone who was interested, as was our custom. I pulled an adult alligator lizard (*Barisia imbricata ciliaris*; local common name *escorpion*, as it is throughout Mexico for lizards in the genera *Gerrhonotus*, *Elgaria* and *Barisia*) out of the bag it was in, and everybody gasped and jumped backwards as you would to avoid certain death. We knew the local people thought they were poisonous, but we had no idea as to exactly how dangerous the local people thought they were. Everybody there thought I was going to keel over dead right in front of them, not because the lizard was going to bite and envenomate me, but because they believed the lizards are so poisonous that merely coming in contact with them would kill you in seconds. They thought the lizards were so poisonous that even coming in contact where one had been sitting would kill you. They were far more scared of alligator lizards than they were any of the local rattlesnake species. David began explaining that the lizards were not poisonous/dangerous in any way, and were in fact beneficial because they eat a wide variety of insects. And in spite of who knows how many generations of belief the lizards were far more dangerous than the local rattlesnakes, after David's simple explanation, one of the kids (a boy about 8 years old) was holding that lizard in his hand. That kid had a profound paradigm shift about alligator lizards right in front of me, and I had a profound paradigm shift of my own about education as a result. Up to that point, I had been like many zoo workers I've known. I viewed the "general public" with kind of a bemused contempt as a necessary evil for my existence (the Houston Zoo was a municipal zoo at the time). I grudgingly gave the occasional lecture, but education was low on my list of priorities. Seeing that kid go from being terrified of to holding that alligator lizard in the space of a few minutes had a huge impact on me, and I began focusing more and more on education as something substantial and important zoos could do, as opposed to the "Service to Science" and general conservation justifications I used myself many times in the past. Then the paper by Sherwood et al. (1989) was published in the journal *Zoo Biology*, and that solidified my view that the greatest contribution I could make regarding conservation was getting out in front of a group of kids with an animal in my hands that they could touch. (And like Carmichael [2008] reported doing, I let kids touch a rattlesnake safely restricted in a tube [the expression of their faces upon touching a rattling tail was priceless!] and a safely-restrained Gila monster [*Heloderma suspectum*] as well as many other taxa.) If we (the people inherently fascinated by nature) can't help present and future voters develop an affective knowledge concerning the same, then all our efforts concerning science and conservation will likely be of little/no utility. And that's the concept I hope anyone reading this discussion ultimately takes away with them.

Part 2. Speculation and Colleen Kelly

In the last paper I was fortunate enough to have published in the *Bulletin of the Chicago Herpetological Society* (Peterson, 2011), I cited Steinbeck's (1995) term "speculative metaphysics" to alert the reader that I was going from a discussion that was, while speculative, in my mind well-supported by the references I cited, to a discussion that was a lot "further" out (i.e., even more speculative), hence more questionable, to even myself, let alone the reader. (I had one person who reviewed the manuscript recommend dropping the entire discussion that began with "Going further out on a speculative limb . . ." because he felt I might lose many/most readers by including it, but as I said above, speculation is not against the law, even if it's way out on the boundaries of what most people feel comfortable considering. So I left it in the paper.) I thought it would be instructive to present Steinbeck's (1995) own words regarding his term "speculative metaphysics," so here they are:

> We had a game which we playfully called speculative metaphysics. It was a sport consisting of lopping off a piece of observed reality and letting it move up through the speculative process like a tree growing tall and bushy. We observed with pleasure how the branches of thought grew away from the trunk of external reality. We believed, as we must, that the laws of thought parallel the laws of things. In our game there was no stricture of rightness. It was an enjoyable exercise on the instruments of our minds, improvisations and variations on a theme, and it gave the same delight and interest that discovered music does. No one can say, "This music is the only music," nor would we say, "This thought is the only thought," but rather, "This is a thought, perhaps well or ill formed, but a thought which is a real thing in nature."

I suspect the reason Steinbeck described this process as "a game we playfully called speculative metaphysics . . ." and as a "sport" was to try and avoid a charge of taking himself too seriously, which didn't work, since one critic described Steinbeck's writing as "tenth-rate philosophizing" (Astro, 1995). (That criticism says more about that critic [not Astro; he mentions the critic's name in his review] than it does anything Steinbeck ever wrote.) The "we" in the above passage are Steinbeck and Ed Ricketts, with whom he traveled to the Sea of Cortez to do an ecological analysis of littoral plant/animal communities on both sides of the Baja Peninsula. Ricketts, aside from his interest in marine biology, was interested in a wide variety of other topics, as was Steinbeck.

While you can engage in speculative thought/metaphysics by yourself, it is far superior to do so with one or more persons (other people can point out where your thinking/logic went awry) as long as they are seriously interested in advancing the idea under discussion, and they check their ego at the door. I can think of no other human activity as rewarding as engaging in such a discussion with one or more intelligent, reasonable, and creative individuals. John Steinbeck had Ed Ricketts as a participant/contributor to such discussions, and I had Colleen Kelly, whom I referenced in the acknowledgments section in my last paper that appeared in the *Bulletin* (Peterson, 2011). I wrote that Colleen enhanced my life to a transcendental degree, but like Steinbeck's (1995) use of "speculative metaphysics," which I felt deserved further exposition, I think Colleen's importance to me and my thinking also deserves further discussion.

Colleen was one of the most intelligent people I have ever met. She was working in the Children's Zoo at the Houston Zoo when I first met her, and while she was well-read in a variety of areas, including animals in general, she did not know very much about amphibians and reptiles. But she began getting interested in both the more we talked, so I began loaning her books from my library. I have never seen anyone read, learn, and then incorporate their new knowledge into a broader synthesis of ideas relating to behavior, ecology, and other topics as quickly as she did. I remember thinking to myself I needed to increase the rate of my own reading or she would pass me up in knowledge, and I had a many-year head start on her. (While this sounds a little pathetic, it is an example of how absolutely ferocious she was in her approach to learning.) She was so enthusiastic about obtaining new information you couldn't help but get sucked into her wake as she sailed by you. But being around her did more than make me want to increase the time I devoted to my own reading; she was of a quality that made me want to be a better person in general.

Her level of knowledge quickly outstripped that of most of the people working in the amphibian and reptile section at the time, and in particular, her interest in animal behavior and her new knowledge of reptiles and amphibians led her to perspectives/ideas that were new to me. Her ability to look at things with a fresh, and sometimes unconventional, perspective made her an extremely interesting person to be around as well as a valuable component of the staff of the amphibian and reptile department.

It was not only I who saw just how gifted an observer/thinker she was. I remember when Gordon Schuett came through Houston one time to visit, Colleen, Gordon, and I went out for dinner. I don't remember if this was the first time he met Colleen, but I clearly remember him suggesting she leave the zoo and study at the university where he was doing research and teaching at the time (I think he was at the University of Wyoming, Laramie). I felt a little anxiety and a little jealousy when he made this suggestion; the anxiety came from me not wanting her to leave because she was what she was, and the jealousy came from the fact he had never made the same suggestion to me. I think I would remember if he had, because I can imagine few higher compliments than Gordon Schuett making such a suggestion. But I understood why he suggested this to Colleen, because I frequently felt like a dim bulb next to her radiance. But she stayed in Houston, and I was glad. Other intelligent and creative friends of mine recognized the qualities Colleen possessed, and her contributions to any of our conversations always enriched them beyond where they would have been had she not been present.

Another thing I quickly learned after meeting her was that arguing with her was generally a losing proposition. She did not suffer fools gladly, and this fool quickly learned to really focus on the logic/reason of the points under consideration, and not allow anger or frustration to creep into my thinking or it was a lost cause. She had a sense of logic that was both inborn and razor sharp. I was taking a course on symbolic logic one semester at the University of Houston, and a number of weeks into the semester while doing homework, I came across a problem that left me so discombobulated I didn't even get mad like I used to do while doing "kiddie" algebra homework. She suggested I have her look at it, which I did, thinking there was little chance she could figure it out. About half a second after looking at the problem, she explained it to me. Sometimes it seemed to me like she had several Cray supercomputers in her head, she was so logical.

It wasn't only matters of science she was gifted in; she was also quite gifted in the creative arts as well. When she began taking classes at the University of Houston, she tested right out of the lower level English classes. When given a homework assignment that consisted of writing a profile of someone the students knew, Colleen wrote a profile of me she titled "A Cold-blooded Way to Make a Living." It was so well-written that it was incorporated in a writing textbook published by the university. She wrote excellent poetry, could analyze and write about literature at a high level, and could also paint and draw pretty well.

But our friendship wasn't only based on serious/metaphysical discussions of science (including philosophy), the fine arts, and theology; we could both be pretty silly at times as well. I still use the term she coined for rock rattlesnakes (lepidarlings) to this day, and she never rolled her eyes like some others did when I called Gila monsters "Gila puppies." She didn't think me giving the slugs I fed in my back yard names and imaginary family histories was excessively puerile. She understood that being deadly serious about some things didn't mean you had to lose your sense of humor, no matter how juvenile or irreverent.

Colleen also gave me encouragement/moral support during

some pretty trying times. In the early 1980s, I began work on some ideas I had regarding evolutionary biology that either conflicted with or were new to accepted theory. In not having an undergraduate degree in anything, even basket weaving, and having never taken a course in biochemistry/genetics etc., I didn't really need anyone telling me (which I did hear) how incredibly presumptuous it was for me to think I could come up with any significant ideas regarding evolutionary biology. I was painfully aware of this myself. But Colleen had confidence in my ability to use reason in seeing accepted phenomena with a new perspective, and when I was wracked with self-doubt, her support helped me make forward progress. My manuscripts eventually made it through a rigorous peer-review process and were published in the journal *Evolutionary Theory*, so Colleen's faith in my ability to think and see things in a new light was validated. I seriously doubt I would have kept working in the face of the opposition I was facing had it not been for Colleen.

Then, years later, I was fired from my position at the Houston Zoo. I had considered my job at the Houston Zoo the absolute most important thing in my life, so logically (and this was the case) I felt that losing my losing my job at the zoo was the absolute worst thing I could ever experience. But Colleen's support got me through that as well, and unlike others I had known over the years who left zoo work in under less than ideal circumstances, or were fired, I did not lose interest in my own animals, and I even kept working on a several manuscripts reporting undescribed behaviors in Gila monsters (*Heloderma suspectum*) and mangrove water snakes (*Nerodia clarkii compressicauda*). But then Colleen died, and I found out what actually was the worst thing I could experience, ever. I lost my motivation to have anything to do with amphibians and reptiles, and animals in general. It has been more than 10 years since her death, and while I have regained my interest in the natural world, I still feel a near-terminal level of grief, because Colleen is not here to enrich that or any other aspect of my life. I would trade many, if not most, and some days all, of my tomorrows to be able to see and speak to her again. That is not hyperbole; that is the calculus of deep, deep sorrow.

At the end of his novel *The Winter of Our Discontent*, John Steinbeck compares each of us to individual, lonely points of light, and says it's "so much darker when a light goes out than it would have been if it had never shone." I can attest to the bitter truth behind that concept, with one important difference: If my closest friends and my family can be thought of as representing distant points of light in a dark, cold, impersonal universe, then Colleen Kelly was a nearby sun, and I was warmed in the purest, brilliant light imaginable in her presence, the nature of which I know I will not see again in this lifetime.

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The History and Keeping of Veiled Chameleons

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When people think of chameleons they often think of bizarre lizards with curly tails and swiveling eyes, but when understood, these unearthly characteristics are seen to be clever adaptations that help chameleons survive. Aristotle first noted chameleons in the third century for their ability to change color. The over 100 species are unique in ways that suit their habitat and life-style. One of the largest and most unusual is the veiled chameleon, *Chamaeleo calyptratus*, of the Arabian Peninsula. It was first bred in captivity in Czechoslovakia in 1987 and then imported to the U.S. in 1990. Breeding efforts started in 1991 at the San

Diego Zoo and have made “veileds” a popular pet throughout Europe and the U.S.

Keeping a veiled chameleon can be a challenging and rewarding experience. These chameleons are among the most sought-after chameleons in the pet trade. Reptile enthusiasts admire them for their size, color and durability. An ideal terrarium for these animals should be made of fine mesh, not glass or plastic. The mesh provides good climbing material and allows air to circulate freely throughout the cage. The cage should be taller than wide because they are an arboreal or tree-dwelling species. Fake vines, twigs and other climbable material should crisscross the cage interior, making “chameleon highways.” Living plants are also good, but be aware that they will be eaten by the chameleon, so make sure they’re nontoxic. They need an easily accessible basking spot that’s 90 to 105°F. They also need a UVB light that gives them their daily vitamin D. Veiled chameleons are omnivores, meaning they will eat both animal and plant matter. Captive veiled chameleons will eat crickets, meal worms, nightcrawlers, cockroaches, pill bugs and other wild caught insects dusted with calcium and vitamin powder. Lettuce and other leafy greens should be fed daily. They are big enough to eat small vertebrates like mice, but these should only be fed to them once a month if at all.

Veiled chameleons have a variety of different habitats in the wild. Their native range includes western Yemen and southeastern Saudi Arabia, mostly near the Red Sea coast or inland rivers. Within this range are three distinct habitats in which the chameleons can be found: large, humid coastal plains along the Red Sea, rain-fed mountain slopes of southern Yemen, and the high plateaus of northern Yemen and southeastern Saudi Arabia. Mountain-dwelling veiled chameleons may receive as much as 80 inches of rain a year but most of their range is sub-desert, receiving less than 20 inches. Temperatures throughout their range can vary dramatically from 68 to higher than 86°F during the day and cold enough to form frost at night. Though much of their habitat has been cultivated to grow crops and raise livestock, the chameleons can thrive in the semi-lush vegetation on farms and orchards, even helping farmers by eating harmful pests. Males of the species divide territory amongst each other into areas in which each male feeds and mates.

The veiled chameleon has interesting adaptations and behaviors that help it survive. A chameleon’s life begins when the mother digs a burrow and lays 27–80 eggs before covering them up. Eight months later the 2- to 3-inch-long babies dig themselves out and scuttle away. The small chameleons grow fast and can reach adulthood in as little as six months. This species can tolerate heat and humidity extremes, from frigid nights to baking deserts. To help them cope with the arid landscape, the chameleons have developed a special gland in their nostrils that releases mineral waste like salt in small puffs rather than excreting it through sweat or urine that would waste precious water. The function of the large head crest is unknown, possibly the crest and the moveable flaps behind the crest help to funnel condensed dew and mist into the mouth. Or the intricate network of blood vessels inside the crest helps circulate and control their body temperature. Or possibly the males’ larger crests impress females or warn off rival males. These are one of the most aggressive species of chameleons. When males see other males they flatten their rib cage and puff out their throats to make themselves appear bigger. Then they turn spectacular colors, sway back and forth, bob their heads and curl and uncurl their tails. If the intruder does still not leave, the males will fight viciously, sometimes even to the death. If still alive, the loser will turn dull green, brown and gray before leaving the winner’s territory.

Veiled chameleons are both similar to and different from other chameleons in many ways. All chameleons are diurnal, which means that they are most active when the sun is up to warm their cold bodies. Chameleons are the only creatures that can move each of their eyes in separate directions simultaneously with their brains processing two different images at the same time. All chameleons also have powerful, sticky tongues that they use to capture their prey. The tongue, which can be as long as the chameleon’s body, has a sticky pad on the end. Prey sticks to the pad and the tongue retracts into the mouth at lightning fast speeds. Most chameleons live in Madagascar and throughout Africa. But the veiled chameleon is an exception, living only on the Arabian Peninsula. A few other exceptions live in India and southern Spain. Chameleons are usually found in wet tropical rainforests, but the veiled chameleon again defies the rule, living mostly in harsh desert conditions. The large crest on veileds is also unique. Some species have large movable head flaps, tall back crests, long nose-like protrusions, or even sharp horns, but no other species boasts as large a crest as the veiled chameleon, whose crest can reach more than 4 inches tall!

Veileds are truly one of the most unusual of chameleons. Their bizarre adaptations may seem strange, but have helped them survive in the wild and thrive in captivity for many years.

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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.

ALDABRA TORTOISE MORPHOTYPES

J. Gerlach [2011, Celonian Conservation and Biology 10(1): 102-112] studied growth patterns of captive-bred Seychelles–Aldabra giant tortoises (*Aldabrachelys*/*Dipsochelys*). This enabled the comparison of the development of 3 distinct morphotypes variously ascribed by different authors to 3 distinct species or a single, variable species (*A./D. dussumieri*/*gigantea*, *arnoldi* and *hololissa*). Geometric morphometric analyses identified differences in growth pattern between the 3 morphotypes of 234 juvenile tortoises reared under identical conditions. In plastral characters, all 3 morphotypes could be distinguished from hatching. Initially, hatchlings were very similar in dorsal view but by 30-cm straight carapace length were distinguishable by relative warp analysis. The *arnoldi* morphotype is the most distinctive, with constriction in the center of the carapace resulting in the beginning of development of saddle-backed morphology from 30 cm. All 3 morphotypes show 2 distinct growth patterns, one from hatching to 20–30 cm and a different pattern above 30 cm. As these morphotypes were reared under identical, largely constant conditions, this change in growth patterns appears to be a result of ontogeny rather than environment. Differences in development of the morphotypes cannot be explained by environmental factors alone and may be the result of differences in gene expression or of small differences in genes associated with skeletal development.

MASSASAUGA THERMOREGULATION

D. S. Harvey and P. J. Weatherhead [2011, Canadian J. Zoology 89(1):60-68] compared the thermoregulatory behavior of massasauga rattlesnakes (*Sistrurus catenatus*) to published results for ratsnakes (*Elaphe obsoleta*) and northern watersnakes (*Nerodia sipedon*), using populations at their northern range limits, to test the hypothesis that given similar benefits of thermoregulation, costs associated with foraging ecology should shape thermoregulatory behavior. More than 32,000 body temperature measurements from 34 individual snakes over 4 years were used to quantify thermoregulation by massasauga rattlesnakes using standard indices and a new index (%MaxE) that describes how much of the thermoregulatory potential available to a snake is realized. On average, massasaugas were much cooler (d_b = 6.9°C) than their preferred body temperature range (30–33.6°C) but warmer ($d_e - d_b$ = 3.3°C) than were they not thermoregulating. Massasaugas realized more than half of their environmental potential for effective thermoregulation (%MaxE = 64%). Consistent with there being less conflict between foraging and thermoregulation for ambush predators than active foragers, massasaugas were more effective thermoregulators than ratsnakes or watersnakes during the day. All three species were effective thermoregulators at night, supporting the assumption that species in a cool environment will thermoregulate when there are few competing interests.

INDIANA HELLBENDER POPULATIONS

N. G. Burgmeier et al. [2011, J. Herpetology 45(2):195-201] note that studies that assess current and historical population densities accurately provide valuable information for management of wildlife species, particularly those in need of immediate conservation concern. The eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*) has experienced drastic declines throughout its range during the previous few decades. This study documents its continued decline over the past 25 years in the last known remaining population in southern Indiana. Mark–recapture surveys were conducted from June 2008 to October 2008 and July 2009 to September 2009 at 35 sites. Despite a considerable increase in effort over previous surveys, this study found fewer total captures and extremely low population densities. Density was estimated at 0.06 individuals/100 m^2, and catch per unit effort was 0.05 individuals/person hour throughout the entire study area. This represents not only a significant decline in numbers from the historical study, but also is well below that reported for populations throughout the species' range. Sex ratios were skewed significantly toward males (2.6 males : 1 female). No subadults or larvae were found, and only two nests were located. This population consists almost exclusively of large, older-age class individuals that show limited signs of reproduction.

CROCS LEARN TO AVOID CANE TOADS

R. Somaweera et al. [2011, Behaviour,148(4):501-517] note that predicting the ecological impacts of invasive species on native fauna is a tough challenge for conservation biologists. One way to deal with that challenge is to stage encounters between the invader and native species in the laboratory, to illuminate likely outcomes of encounters in the wild. The invasion of the highly toxic cane toad *Rhinella marina* across tropical Australia threatens many frog-eating predators, including freshwater crocodiles (*Crocodylus johnstoni*). To predict the impact of cane toads on crocodiles, it is necessary to know whether crocodiles will attack cane toads, and whether predators that survive the toads' poisons will learn to avoid toads. These traits were quantified under lab conditions in hatchling freshwater crocodiles from Lake Argyle in Western Australia. All toad-naïve hatchling crocodiles attacked toads during their first encounter, and none showed signs of overt illness after consuming toads. However, crocodiles rapidly learnt to avoid toads as prey, and only four out of the 10 crocodiles attacked toads during subsequent encounters. Compared to control (toadnaïve) conspecifics, toad-smart crocodiles inflicted fewer bites on toads, held toads in their mouths for shorter time periods, and were more likely to reject toads as prey. In the field, toads were consumed more rarely than native frogs. These results show that hatchling freshwater crocodiles can rapidly learn to avoid cane toads as prey. Hence, even if toads cause mortality of larger crocodiles (as happens in some areas), populations may recover via hatchling recruitment.

TADPOLE PALATABILTY

D. Szuroczki and J. M. L. Richardson [2011, Herpetologica 67(3):213-221] note that while unpalatability in general is well-known to provide prey protection against predators, the role of unpalatability as an antipredator mechanism in larval anurans and more specifically, *Lithobates catesbeianus* (American bullfrog) larvae remains contentious. There are three major problems associated with the majority of the studies done to date: (1) failure to incorporate the existence of a range of relative preferences or palatability, (2) failure to effectively control for predator hunger levels, and (3) failure to consider confounding variables such as prey behavior and prey appearance. The authors sought to alleviate these problems by first training *Lepomis gibbosus* (pumpkinseed sunfish) to consume a standardized food ration for 1 wk and then spiking that food ration the following week with only the skin of three different larval anurans that have been hypothesized to range in palatability (namely, *L. catesbeianus*, *L. clamitans* [green frog], and *L. sylvaticus* [wood frog]). The results of this experiment revealed that a range of palatability does in fact exist, with *L. catesbeianus* being least palatable, *L. clamitans* being somewhat unpalatable, and *L. sylvaticus* being highly palatable. This study was the first to show evidence, devoid of any confounding variables, that *L. catesbeianus* and, to a lesser extent, *L. clamitans* tadpoles are unpalatable to sunfish predators.

EVOLUTION OF CALLS IN AFRICAN CLAWED FROGS

M. L. Tobias [2011, Behaviour 148(4):519-549] notes that for most frogs, advertisement calls are essential for reproductive success, conveying information on species identity, male quality, sexual state and location. While the evolutionary divergence of call characters has been examined in a number of species, the relative impacts of genetic drift or natural and sexual selection remain unclear. Insights into the evolutionary trajectory of vocal signals can be gained by examining how advertisement calls vary in a phylogenetic context. Evolution by genetic drift would be supported if more closely related species express more similar songs. Conversely, a poor correlation between evolutionary history and song expression would suggest evolution shaped by natural or sexual selection. Here, we measure seven song characters in 20 described and two undescribed species of African clawed frogs (genera *Xenopus* and *Silurana*) and four populations of *X. laevis*. Three call types are identified — click, burst and trill — that can be distinguished by click number, call rate and intensity modulation. A fourth type is biphasic, consisting of two of the above. Call types vary in complexity from the simplest, a click, to the most complex, a biphasic call. Maximum parsimony analysis of variation in call type suggests that the ancestral type was of intermediate complexity. Each call type evolved independently more than once and call type is typically not shared by closely related species. These results indicate that call type is homoplasious and has low phylogenetic signal. The authors conclude that the evolution of call type is not due to genetic drift, but is under selective pressure.

DIETS OF WILD HERMANN'S TORTOISES

S. Del Vecchio et al. [2011, Herpetologica 67(3):236-249] note that herbivory is the dominant feeding strategy in tortoises, and dietary shifts are common in response to changes in resource availability. They conducted the first large-scale study of the diets of wild Hermann's tortoises (*Testudo hermanni hermanni*) and found that the study population in central Italy was strictly herbivorous. The tortoises ate primarily legume leaves and grasses in the spring, and switched to flowers and unripe fruit of Butcher's broom (*Ruscus aculeatus*) as these became available in the autumn. There were no significant differences between the diets of males and females. Although tortoise diets included both rare and abundant plant species, they consumed abundant plant species in a higher proportion than those species occurred in the study area. However, some rare plants made up relatively large fractions of the diet, and one of the few nonnative plants (*Conyza canadensis*) at the study area was eaten frequently by tortoises in all seasons, despite its relative rarity. *Ruscus aculeatus* berries may be particularly valuable to tortoises that are about to enter hibernation; hence, *T. hermanni* habitat should be managed to maintain this important plant species.

AMPHISBAENIAN DEMOGRAPHICS

J. Martín et al. [2011, Herpetologica 67(3):250-257] note that amphisbaenians are a group of reptiles specialized for a fossorial life, which makes the study of their peculiar biological and ecological adaptations difficult. The population biology of amphisbaenians is almost unknown. The authors described the seasonal variation in the size, age, and sex structure of a population of the amphisbaenian *Trogonophis wiegmanni* from the Chafarinas Islands, in North Africa. Specifically, they described body size (length and weight), frequency distribution of newborn and older juvenile individuals and adults, sex ratio of adults (which did not differ from a 11 ratio), and proportion of juveniles and newborn individuals in the population. The results indicated that *T. wiegmanni* is a viviparous species that delays reproduction until at least 2.5 yr, that almost half of adult females do not reproduce every year, and that females have a very small brood size (i.e., reproductive females give birth to a single juvenile at the beginning of autumn). The data were also used to infer growth and survival of juveniles, suggesting that mortality of newborn individuals is low. There are many aspects of the population biology of amphisbaenians that remain unknown and further studies are clearly needed.

Advertisements

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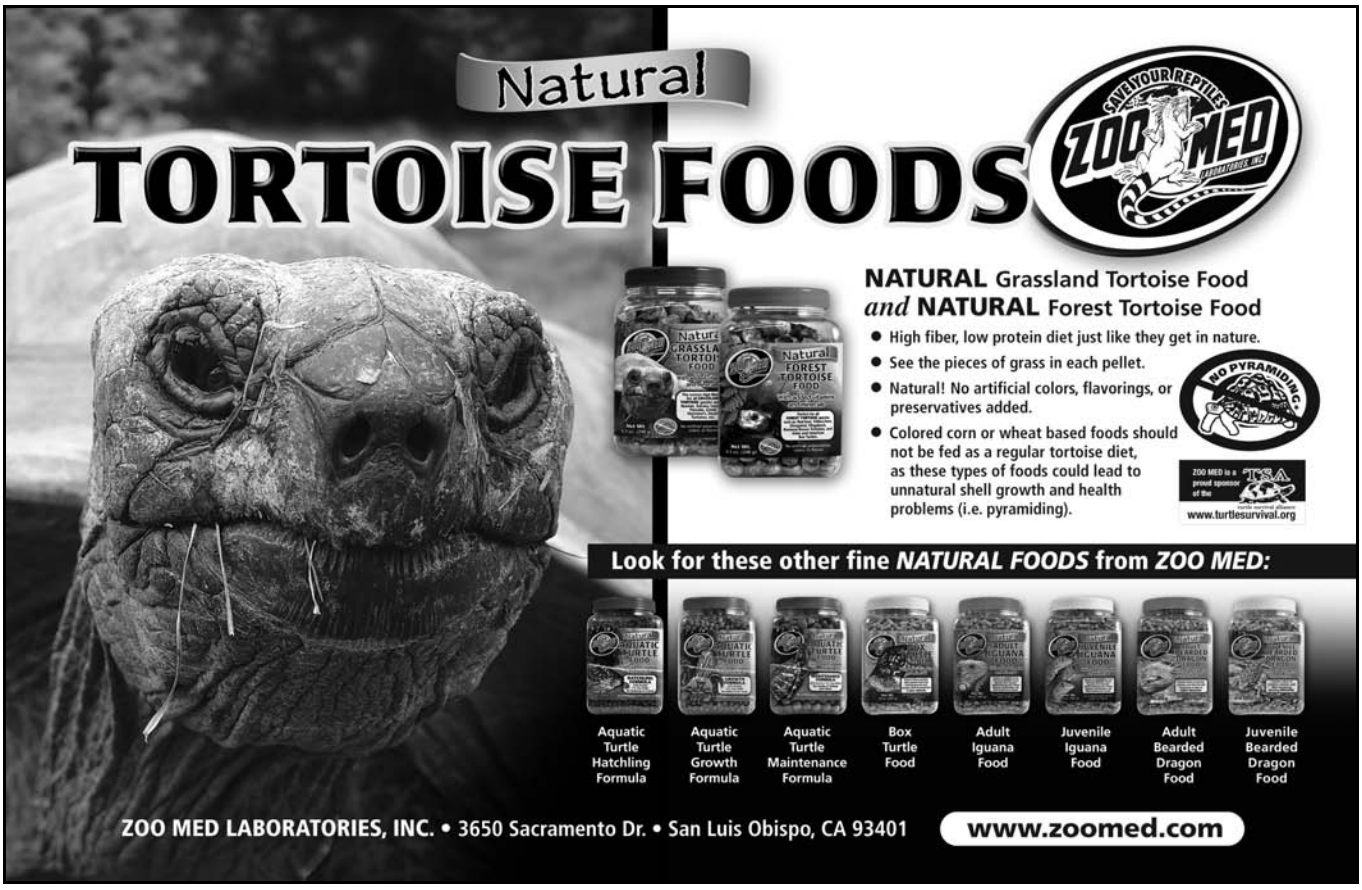


UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, September 28, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Richard Sajdak**, former curator of reptiles at the Milwaukee Zoo and author of the recent book, *Hunters in the Trees: A Natural History of Arboreal Snakes*, will talk about the adaptations and life-styles of snakes that live above the ground.

Dr. Joe Mendelson, curator of herpetology at ZooAtlanta and current president of the Society for the Study of Amphibians and Reptiles, will be speaking at the October 26 meeting. Joe is at the forefront of efforts to deal with the declining amphibian problem.

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.

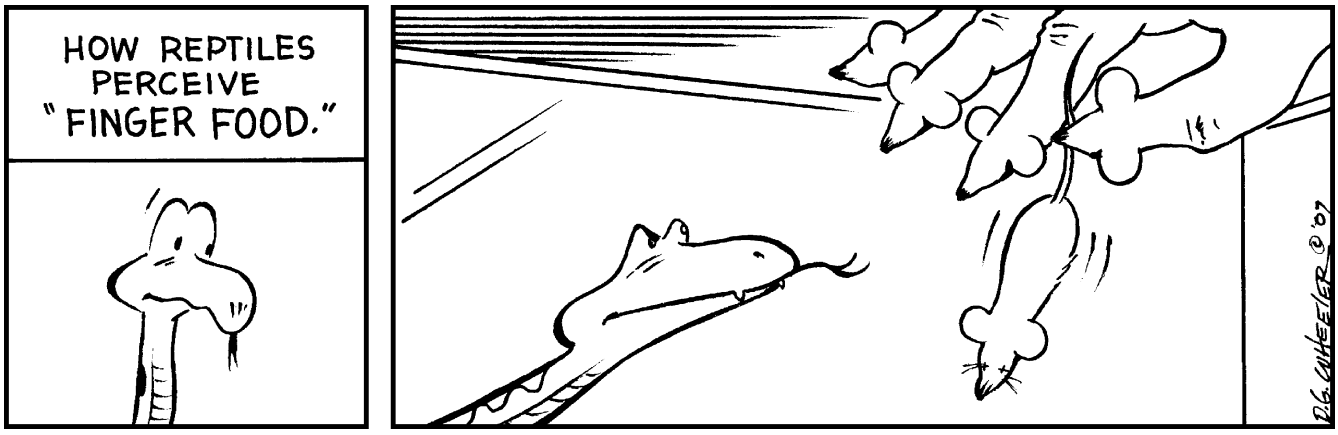
Board of Directors Meeting

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., October 14, in the adult meeting room on the second floor of the Schaumburg Township District Library, 130 S. Roselle Road, Schaumburg.

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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