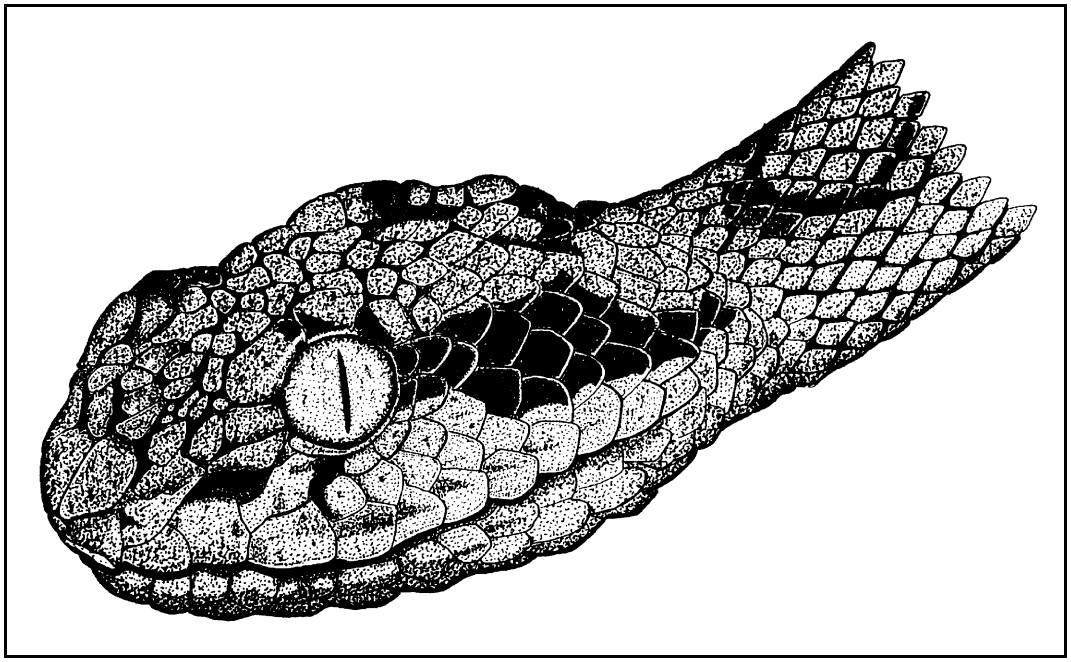
BULLETIN
of the
Chicago Herpetological Society

Volume 43, Number 1
January 2008



BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY
Volume 43, Number 1
January 2008

Cover: Sri Lankan tree pitviper, *Trimeresurus trigonocephalus*. Drawing by R. Michael Burger.

The Chicago Herpetological Society is a nonprofit organization incorporated under the laws of the state of Illinois. Its purposes are education, conservation and the advancement of herpetology. Meetings are announced in this publication, and are normally held at 7:30 P.M., the last Wednesday of each month.

Membership in the CHS includes a subscription to the monthly *Bulletin*. Annual dues are: Individual Membership, $25.00; Family Membership, $28.00; Sustaining Membership, $50.00; Contributing Membership, $100.00; Institutional Membership, $38.00. Remittance must be made in U.S. funds. Subscribers outside the U.S. must add $12.00 for postage. Send membership dues or address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago, IL 60614.

Manuscripts published in the *Bulletin of the Chicago Herpetological Society* are not peer reviewed. Manuscripts should be submitted, if possible, on IBM PC-compatible or Macintosh format diskettes. Alternatively, manuscripts may be submitted in duplicate, typewritten and double spaced. Manuscripts and letters concerning editorial business should be sent to: Chicago Herpetological Society, Publications Secretary, 2430 N. Cannon Drive, Chicago, IL 60614. **Back issues** are limited but are available from the Publications Secretary for $2.50 per issue postpaid. **Visit the CHS home page at < http://www.Chicagoherp.org>** .

The *Bulletin of the Chicago Herpetological Society* (ISSN 0009-3564) is published monthly by the Chicago Herpetological Society, 2430 N. Cannon Drive, Chicago IL 60614. Periodicals postage paid at Chicago IL. **Postmaster:** Send address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago IL 60614.

Bull. Chicago Herp. Soc. 43(1):1-9, 2008

A Technique for Artificial Insemination in Squamates

Raymond Hoser
(Snakebusters)
488 Park Road
Park Orchards, Victoria, 3114
AUSTRALIA
adder@smuggled.com

Abstract

This paper details the development and application of a simple to use method of artificial insemination in squamates of various taxa. The benefits are obvious. This includes that of breeding specimens not inclined to mate and the ability to transport semen, rather than reptiles across suburbs, cities, or even states and countries. In the Australian context this is significant as there are "six month rules" in most states, making breeding loans of actual specimens sometimes logistically difficult. While most of our work has been with snakes, we have trialled the same techniques with lizards and found that what is reported here for snakes transposes to lizards as well. In the USA context, the methods make hybrids between taxa simple to achieve, as it no longer requires the reptiles to mate.

Introduction (The problem)

All squamates bred at our facility (elapids, pythons and large skinks), are housed similarly and subjected to the same annual temperature regimes, which are spelled out fully in Hoser (2006, 2007). In summary this involves seven weeks of cooling whereby the cage temperature is kept below 20°C at all times (with rare rises above this perhaps if the reptile is used in a "show" or "demonstration"). Temperatures do still have a slight diurnal cycle of up and down. This is followed by a period of 12 hours a day "full heat" and 12 hours of "night," after which the reptiles get 18 hours a day heat or all heat, in terms of the warmest section of the cage. For us "cages" are in fact large plastic tubs.

The exact timing of the "winter" months at our facility broadly mirrors that of the wild, but our preference is to run the seasons about eight weeks ahead of wild counterparts here in Melbourne, Victoria, the end result being our snakes breed earlier.

For example in late 2007, our first breeding female (venomoid) eastern brown snake (*Pseudonaja textilis*) laid a full clutch of 8 fertile eggs at end October, whereas the wild counterparts usually lay at end December. Two years earlier the same snake produced 10 eggs (9 fertile)(see Hoser, 2006).

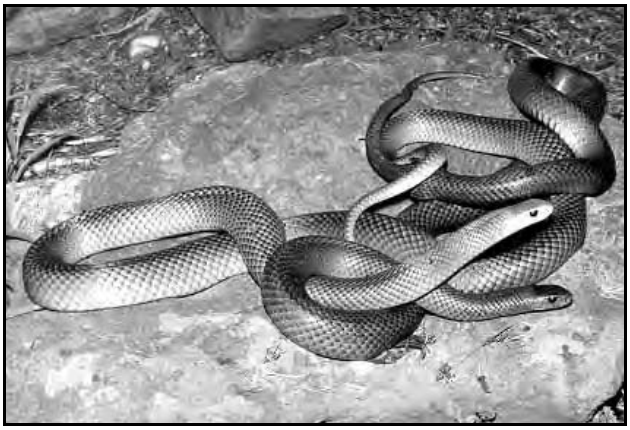
In July–November 2006 (broadly spring here in Australia), we attempted to breed jaffa (Collett's) snakes at our facility. The snakes were two males aged 3 years and a 4-year-old female. The male Collett's snakes had been held since hatching at the facility of Paul Fisher (Hoppers Crossing, Victoria) and the female, hatched by another breeder, was raised for two years by Scott Eipper and then held by myself for about two years.

While one of the males attempted to mount and mate the female in late 2006, no actual copulation occurred. At the time it was thought simply that the male wasn't trying hard enough, and perhaps the male may improve with age, as is often the case with snakes.

The following spring (2007), we attempted to breed the snakes again and there was no success in mating. This time both males tried hard and yet the female successfully avoided copulation. She would flee as soon as the males attempted to mount her. The cooling regime the previous "winter" had been particularly "brutal" in that the reptiles were kept colder for longer (8 weeks under 20°C) and this reflected across the board in particularly vigorous mating activity across all taxa.

All of the Collett's snakes mentioned here had been made venomoid in late 2004, using the successful method detailed earlier that year by Hoser (2004). In fact all Hoser elapids referred to in this paper are as of 2007, long-term venomoids.

"Venomoid" means permanent surgical removal of venom glands. The venomoid state is known to have no effect on fertility, as long-term venomoids have been bred at our facility (producing normal healthy [and venomous] young). Examples include death adders (*Acanthophis antarcticus*), eastern brown snakes (*Pseudonaja textilis*), tiger snakes (*Notechis scutatus*), and copperheads (*Austrelaps superbus*). These were all of the elapid taxa for which we held adult pairs during the relevant period (2004–2007), excluding our red-bellied black snakes (*Pseudechis porphyriacus*). This includes across several sea-



Eastern brown snakes mating in 2005. The female has been venomoid for about four years and bred twice since the operation. Photograph by the author.

sons involving the same snakes.

Our red-bellied black snakes (two males and a female) mated and produced "slugs" in 2005/6, and hence by definition hadn't bred, but at the time of writing this paper the female was noticeably gravid again (end 2007) and was expected to produce young either late in 2007 or early 2008 (also see later this paper).

In my experience, normally fertile female snakes that are either ovulating or about to, are happy to be mounted and mated and yet this above-mentioned female Collett's was violently opposed to the idea. Having run out of ideas or means to encourage mating, I decided to "step outside the square" and attempt artificial insemination (AI).

Materials and Methods

The theory was simple. Get semen from the male and put it into the female. After that, the spermatozoa should do the rest! Study of artificial insemination methods used for other vertebrates such as cattle, dogs, sheep, humans and even birds, yielded two main methods to acquire semen.

One was "electro-ejaculation," whereby an electric shock causes ejaculation. For several reasons, the idea was thought not viable in terms of the snakes. Getting hold of an "electro-ejaculation machine" was near impossible or cost prohibitive and then there was the problem of working out the voltage required to get semen but not kill the reptile by electrocution. That is assuming the process was even possible for reptiles!

The alternative was to masturbate the snakes to get semen. This is the preferred method of choice for animals including bulls and horses, who are generally made to mate with a false vagina. However the concept of manipulating snakes to produce semen was unknown territory for which I could get no guidance from any veterinarians or others I thought likely to know.

Hence the technique for collecting semen from male snakes was one that I had to develop from scratch. In hindsight it was remarkably simple.

Over the last 40 years of keeping, breeding and observing snakes, observations of male snakes and mating snakes yielded certain pointers. Most male snakes shed so called "semen plugs" which are essentially globules of dried and old semen that accumulate in the hemipenal pockets. Hence I knew that snakes oozed or released semen at times other than copulation. This concept went further when it was realized that sometimes male snakes mount females, attempt to mate without success and then ejaculate semen over a female. Alternatively and worst case, would be a male snake mating that breaks off the copulation and has semen on the hemipenes. This occurs naturally and if one looks at the picture of the everted hemipenis in a male death adder on page 19 of Hoser (1989) you will see exactly this.

Knowing all the above pointers, it was thought that it might be possible to stimulate a known fertile male snake that has mounted a female to get excited and ejaculate semen in a quantity sufficient to be collected and transferred to a female snake. Based on observations of the quantity and consistency of semen shed in semen plugs and observed when snakes ejaculated, it was decided to use a glass pipette or capillary tube to collect the semen and transfer it to the female snake.

Pipettes come in various sizes and shapes and as it happens the first one trialed was the best. This was a Kimax-51, 1.5–1.8 mm outer diameter, 100 mm straight glass capillary tube that is sold commercially in 100-tube lots packed in small glass containers in boxes of various numbers. These are also the tubes of choice for aviculturists who use AI. They suggested these as they are "non-heparin coated" and heparin is believed to have an adverse effect on semen.

The pipettes were in the first instance hard to acquire as neither veterinarians, GPs, hospitals nor pathology labs routinely stock them. However science departments of most schools use these or similar and hence small numbers were readily available, including in various sizes and formats in order to confirm the best tube for the job, that being the one just named.

The first successful collection of semen from a snake came when a male eastern brown snake was seen mounting a female (who was already gravid from him). The caudal region was stroked with my finger and the snake was visibly aroused and attempted to copulate with it. As I rubbed the snake (just above the cloacal opening on the side of the base of the tail), the snake became stimulated and after less than a minute he ejaculated semen. This was gathered by sucking into the pipette and then checked on a microscope slide at 400 × magnification. The sperm cells were readily visible.

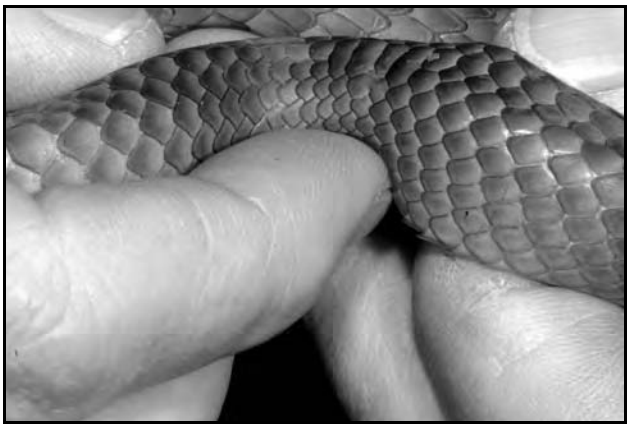
Similar was attempted with the first male Collett's snake to attempt to mate the female and again semen was collectable from both hemipenes within 60 seconds.

The second male, also interested in mating the female, but not yet having mounted her, was also used for semen collection. In this case, I simply grabbed the snake's tail as it sat in the cage. The relevant region was rubbed and again semen was yielded. This was the first snake stimulated to produce semen without actually being in the process of mating a female.

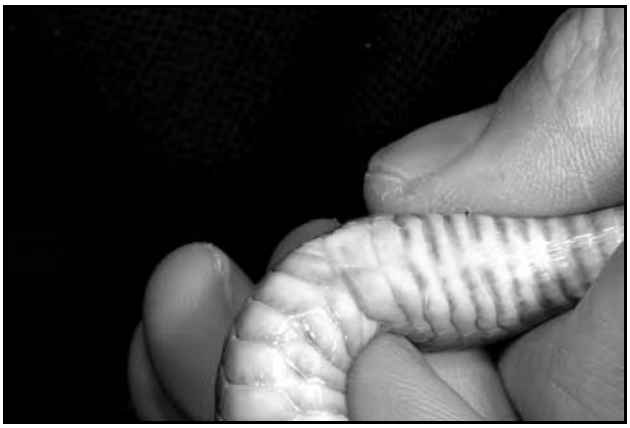
A black-headed python was seen trying to mate an olive python and it was removed from the transport box. The tail was rubbed (at the same place as for the elapids) and the snake yielded globules of semen within seconds.

In other words it was possible to masturbate a snake and get semen. Taking the process further, two male tiger snakes held in cages on their own and simply resting were each removed and easily masturbated to yield semen. With practice, acquiring semen from snakes (by rubbing the anterior caudal region above the vent) was easy, and for snakes that were apparently fertile, semen was now readily available.

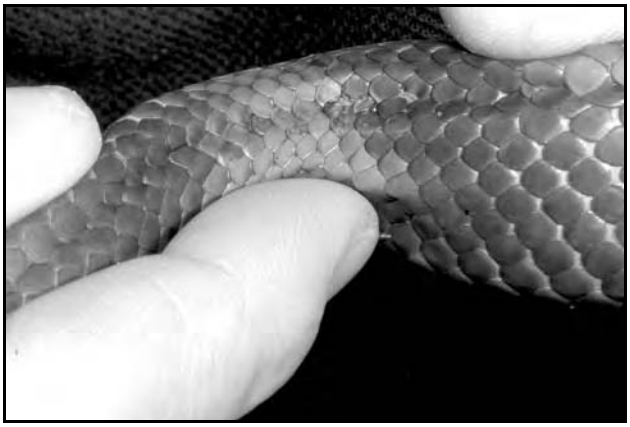
In terms of the AI process, the theoretically hardest part of the operation was now complete. In fact by the method devised, getting semen was now simple and routine and could be done with an unaroused snake simply resting on its own in a cage.



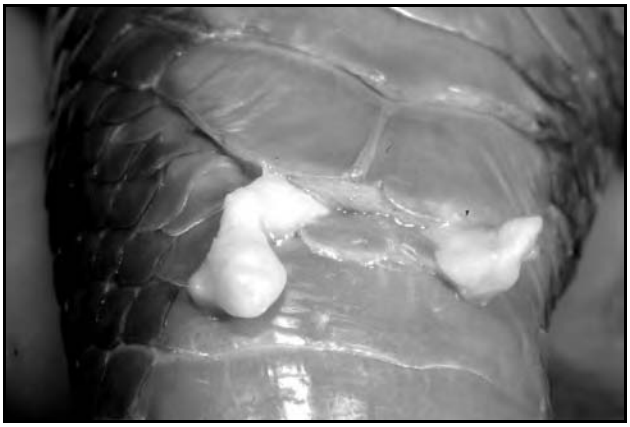
Venomoid male eastern brown snake being manipulated to produce semen. Note the distinct downard kink in the anal region as the snake is stimulated.



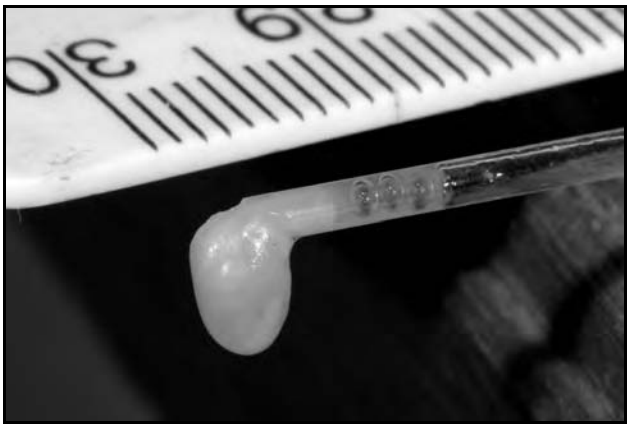
Ventral view of venomoid eastern brown snake being stimulated to produce semen.



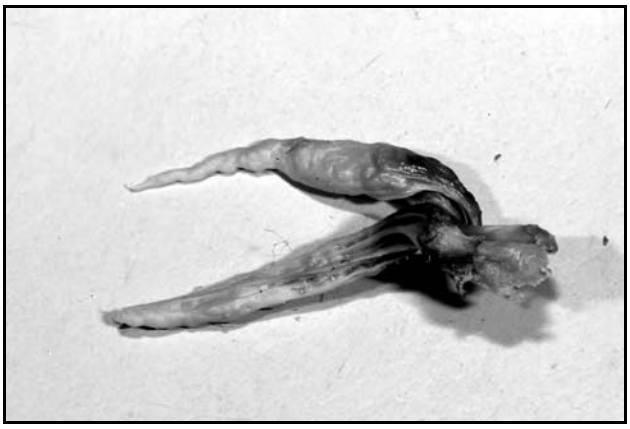
Venomoid male Collett's snake being manipulated to produce semen.



Two globules of fresh semen are visible on this male Collett's snake.



Semen sample from a black-headed python shown next to a ruler to give an accurate gauge of the amount of semen released and the size and shape of capillary tube (pipette) that collects the semen.



A semen plug taken from an adult male (Brisbane) carpet python. The dried semen in such a plug is of no use for artificial insemination as the spermatozoa are dead.

All photographs by the author.

Please note that in terms of the venomous taxa used, all were well-adjusted venomoid (no venom in the snakes) that are handled (by free handling only) for live shows on a daily basis. Hence for these snakes, they have no handling stress or fear of human interaction with them. No masturbated reptiles of any taxa ever attempted to flee or bite.

Masturbation of non-venomoid dangerously venomous elapids is not something that should be attempted, unless the handler is both experienced with the snake species, the snake itself is relatively tame and the handler is happy to countenance the possibility of a potentially fatal bite.

For the record, the process of obtaining semen did not yield any signs of stress in the snakes. The only obvious variables in behavior noted were the obvious movements downwards of the pelvic (or equivalent) region of the snake as they were stimulated, and a greatly increased frequency of tongue-flicking as the snakes were aroused.

Transfer of semen to the female was via the pipette.

Acquiring semen

It seems that not all snakes produce semen all the time. In our collection it became apparent that the snakes that mated most were those that produced the most semen. The correlation was direct.

For tiger snakes, of which we held six adult males as of end 2007, the ones who mated the most all yielded copious amounts of semen readily, while I was unable to get semen from some who rarely showed interest in sex. At the time this semen collection was done, the snakes were caged individually, as we were trying to avoid breeding this taxon.

The same pattern was seen across other taxa of snakes (elapids and pythons) as well as skinks, from which we were able to get semen using the same method. It should be noted however that lizards are far harder to stimulate than snakes due to their increased tail muscularity and other tissue present in the region that apparently makes direct hemipenal stimulation harder. (Please note the extreme care needed with tail shedding taxa to avoid any incidents of autotomy).

Notwithstanding this, it was possible to extract semen from all lizard taxa we hold, which include Cunningham's skinks (*Egernia cunninghami*), blotched bluetongues (*Tiliqua nigrolutea*), eastern bluetongues (*Tiliqua scincoides*) and shinglebacks (*Trachydosaurus rugosus*). Other lizards were able to be masturbated at other facilities to yield semen to be used for insemination, including smaller skink species, lace monitors (*Varanus varius*), Gould's monitors (*Varanus gouldii*), bearded dragons (*Pogona barbata* and *P. vitticeps*), Gippsland water dragons and robust velvet geckos (*Oedura robusta*).

Assuming the reptile (snake or lizard) is tractable, we found the best method to acquire semen was to simply hold the reptile in a way that is comfortable for it and to rub the hemipenal area (near the vent) with one finger with moderate speed. You will know the reptile is stimulated as it pushes that region downwards, to give the angled position of vent region as seen when a snake attempts to copulate a female in the "natural" way. Most snake keepers are familiar with this positioning. While the male may evert a hemipenis if stimulated, as a rule this does not occur, and it is not necessary for semen extraction. For reasons not completely certain, snakes (and lizards) will ejaculate semen while the hemipenes remain retracted in the tail.

Hemipenal plugs and dried feces may be shed and should be disregarded (discarded). On some occasions, dried fecal matter may be around the cloacal region and this should be cleaned away with a wet cloth before masturbating the snake so as to ensure a "clean" semen sample is obtained.

As a rule, if the snake has semen, it should yield it within 60 seconds. Cooler snakes take longer to yield semen than warmer ones. The same applies for lizards, albeit on a slower timeline, although smaller taxa yield semen faster.

There is usually no need to check semen under a microscope for viability. If the snakes or lizards have been cooled over winter according to the regime we use (see above), viable sperm seems to be a formality for almost all taxa, save for the inevitable small percentage that will never be fertile.

As part of the perfectionist system here, semen was checked under a microscope and images sent to Dr Barrymore Walters, an expert whose day job involves human vasectomies and microscopic inspection of semen samples. While snake semen is different to that of human, he seemed to think what I sent him was OK and his judgment later proved correct.

Semen from the hemipenal plugs in snakes was checked and found to be clumped, which is typical of dead and non-viable semen, indicating that snake semen does have a limited "shelf life" although it is hard to ascertain what that is.

If a snake yields semen from one hemipenal pocket, it will generally yield from both and I found that the best technique was to masturbate both sides so the semen sat either just inside or just outside the ventral scale, from where it could easily be sucked into a capillary tube. One tube was used for each side, enabling two lots to be gathered at a time. Often I massaged the hemipenal region to assist in bringing the semen towards the vent for collection.

Once a snake has yielded semen, it takes 5–7 days for it to produce more. As a rule, snakes do not yield semen in smaller amounts when an attempt is made to extract semen in a period under the 5- to 7-day regeneration period. Instead the snake yields nothing. In other words semen seems to be yielded in distinct "loads."

The semen that is viable and used is not the hardened material seen in dried hemipenal semen plugs. Rather it is the milky white material that is copiously yielded at the time of masturbation and as an obvious result of it. To get an idea of the quantity, it is best to view the photograph on the facing page. Sometimes masturbation of a snake will yield a semen plug followed by good whitish semen. In this situation the latter (whitish) material, should be used only.

Interestingly, some male snakes will still attempt to mount and mate females after being taxed of semen. This is interest-

ing because as a rule, once I have extracted a single load of semen from each hemipenis, I am unable to repeat the process until the 5- to 7-day recharge period has elapsed. An important question to answer is whether or not a snake that mates immediately after I've taxed it for semen is still able to pass viable semen (sperm) to a female at that time.

Refining the method of semen transfer

Aviculturists who do AI with birds said that they'd simply suck semen into the pipette and then place it into the ventral opening of the bird and blow out the semen inside the bird. They said in most cases, the spermatozoa did the rest and conception was the rule. The same was done with the snakes, and we now know this is true for them as well.

However, sometimes the semen was too viscous to be blown out of the tube with success. I then had to remove the tube from the uninseminated snake. Narrower tubes were even harder to utilize than the originals and for the wider ones other issues arose, mainly in terms of sucking up the semen and then being able to blow it out, as opposed to just air. You see unless the semen blocks the tube, it will give a pathway for air to simply blow past it. Due to the nature of the human mouth, it was far easier to suck fluid into the tube than blow it out. Hence the occasional difficulty of blowing the semen out of the tube into the female snake.

So the logistical problem had become how to quickly and effectively get the semen into the female snake. The superior method developed was to get the male snake to the stage of yielding semen. At that point the capillary tube is placed in water to a point where a small amount of water is sucked in. This sometimes occurs automatically and other times you may need to do this by careful sucking. Water is less viscous than semen and also known to be harmless to it.

Semen is then sucked into the tube and then a small amount of extra water, making the semen effectively inside the tube padded by water on either side. By carefully sucking either end of the tube, you will be able to move the semen back and forth in the tube. Once you get to the stage where the semen is easily moved, you should attempt the same by blowing. When you get to the stage where you can move the semen up and down by blowing the tube, and with relative ease, you are ready to inseminate the female.

The cloaca is opened sufficiently to allow the tube to pass through. Usually this is simple, but if it is dry and tight, lubrication with water will solve the problem. In summary the tube is inserted to a depth of just under 3.8 cm in a 151-cm-long snake and the tube blown to leave the semen in the female. You will know that the semen is inside the snake when you notice the air back-up (from you) going into the snake, at which point the tube is removed and the vent held shut. Assuming this is done properly, the semen will remain in the snake and make its way to the appropriate part of the female to fertilize ova or eggs.

With regard to the insemination of the female, there are other important pointers and notes. The tube will hit an apparent (soft tissue) "block" when pushing in an anterior direction. To give an indication as to the approximate depth of the "block" it should be about 3.8 cm into the snake if it's a 151 cm total length snake (18 cm tail and 133 cm snout–vent). This should not be pushed or pressured and the tube pulled back a few mm from this "block" point.

These measurements as given here are important as they can be scaled pro-rata up or down for larger or smaller snakes to give an indication as to likely and expected penetration depths. If you find a "block" a substantially earlier than the indicated distance, then it will be caused by fecal material ready to be expelled. This should be removed before attempting insemination (see elsewhere in this paper for an explanation as to how this is done) in a manner that is simple and painless for the snake.

Assuming no fecal material in the relevant part of the snake then the insemination of the snake should be routine and trouble free, and success for the procedure assumed likely. If there is trouble blowing the semen into the female, it is often easier to blow and withdraw the tube at the same time. The backward movement creates a gap (void), which then creates a vacuum to suck out the semen sample. When doing this, you may accidentally release semen either at the vent opening or even outside the snake. If this happens, the semen (which usually presents as a sort of line of fluidy gunk), can usually be sucked back into the tube and the whole insemination process repeated.

Another mishap that occurs occasionally is that you may suck in semen to your mouth and then spit it out. Often this can be reused as well. While none of this is sterile and there is an obvious germ transmission, no snakes inseminated this way have ever shown signs of illness and noting that reptiles cloacal openings are exposed to these germs in the normal course of crawling over things, this is not seen as an issue worth worrying about.

If the semen sample is degraded or lost before being implanted into the female, then the second one obtained (usual), can be used. Alternatively if all runs to the theory and plan, it becomes possible to inseminate two snakes from one snake on one day.

The same as just described applies to lizards.

Measuring and maximizing success

All the above also assumes a pre-winter, winter, spring heating and cooling regime sufficient to get both male and female fertility cycles synchronized and viable.

How long until fertilization takes place after copulation or insemination is hard to ascertain and depends on variables such as potential sperm storage and ovulation cycles. However, my own breeding records have instances of snakes mating one day and conception being measurable effectively from that date (no measurable delay) and with no measurable differences in the development of young or eggs when born (excluding incubation-based temperature variables for eggs). Thus, it is reasonable to assume that active spermatozoa will travel to the correct parts of the snake well within 24 hours.

The significance of knowing this comes when attempting to

ascertain the likelihood of successful insemination (that is, fertilized eggs). If the female defecates within 24 hours of insemination, then semen may be released before it has time to work effectively. If this occurs, it'd be logical to repeat the insemination again, as soon as male semen becomes available (about a week if you only have one viable male).

To that end, it is possible to determine if a female snake is likely to defecate. Females can be palpated and an impending defecation determined in terms of likelihood. While the advice may be to delay insemination until after defecation, there are other means to deal with this common potential problem.

First, semen should only be collected if the female is deemed "clean" — feces-free and ready in every other way. If the female is likely to defecate, a delay may be in order.

Having said this, in our situation the better method involved palpitating the female for feces. If there was deemed a likelihood of defecation within a few days, the snake would be placed in luke warm (25–30°C water) in a sealed container (with air holes only) to a depth sufficient to immerse the snake, but not too deep to drown it. Usually such an environment will encourage any fecal material to be released within a few hours of soaking. After this time the snake is placed back in its dry cage and after the snake and the relevant part of the body has dried out, the insemination is done.

By way of example, this regime was practiced with success when (successfully) inseminating a Bredl's python, that was made to defecate before it was inseminated. The same also applies to lizards, noting that for them it is harder to ascertain major defecations.

It has been suggested that soaking of snakes and lizards to encourage defecation prior to insemination is advantageous in terms of maximizing success. If there is not a ready supply of semen to use repeatedly (as in you only have one chance of successful insemination), then soaking to ensure minimal risk of fecal disruption is the best course of action.

Just as snakes have no issue with sexing by probing if done properly and with care, the same applies with insemination of female snakes if done with due care.

Due to the variable of minor defecations, that may also inadvertently expel the semen, the advice for dealing with inseminated females is as follows: The cage the female is kept in for the day or two following insemination should be small, totally clean and one in which any new fecal material can be seen. If any defecation is seen within 48 hours of insemination, then my advice is to re-attempt it on the basis that the first attempt may be a failure.

For our set-up all snakes and lizards are kept in what are usually very clean plastic tubs and because post-insemination we ensure no fecal material is in the cages/tubs, any defecations are easily seen.

Storing semen and related issues

For mammals and other taxa, semen is often stored frozen and often for long periods. Because our method involved immediate or near immediate insemination, storage has been a non-issue.

Sitting in a room at room temperature, globules of semen will dry up quickly, being noticeably drier and harder to deal with within minutes. For this reason, masturbation of snake and subsequent insemination should be as quick a process as possible and as a rule can be executed within 60 seconds from extraction to insemination, assuming everything is at the same venue.

Semen in capillary tubes takes a lot longer to dry out, because of the relatively small amount of contact between air and semen. Semen held at room temperature in a capillary tube, padded with water at either end will last for hours and apparently not degrade if stored in a sealed box, itself lined with moist tissue.

This is known, because semen stored this way for several hours has been checked under a microscope and found to be "normal," enabling successful inseminations to have been done in various collections across our home state of Victoria, without the need to move reptiles. This method has already enabled successful inseminations in numerous reptiles in various collections involving reptiles that would otherwise never have copulated, or never even heve been in physical contact.

Improperly sexed reptiles and the need for routine probing

An issue that has reared its head several times recently has been incorrectly sexed reptiles. At our facility this has never been an issue. All squamates are probed and this method (if done properly) remains the easiest and simplest method to 100% reliably sex them. Hence in terms of breeding, insemination and the like, we've always been able to go the males and tax them for semen, or impregnate known females.

Recently we supplied semen to other keepers and have struck some interesting obstacles. Semen from a venomoid male inland taipan (*Oxyuranus microlepidotus*) was useless when it became clear that the "female" that had supposedly been probed as such was an obvious male. I saw the 2-m snake with large tail and went through the motions of probing it as male.

In another incident, I used semen from one of my venomoid male Collett's snakes to inseminate a long-term captive "female" that had apparently eaten a smaller "male" some years earlier. As for the inland taipan incident, the person was a long-term herpetologist of high repute, whom I had no reason to doubt. I took the semen from the male and implanted it into the "female." This part was apparently routine. It was only after placing the "female" back in the cage that I thought the tail of the "female" was too large. The snake was retrieved, probed and turned out to be a male!

When inseminating the (now known to be male) Collett's snake, it was noticed that the pipette didn't hit the same "block" as seen in all the female snakes. In other words it could be passed much further into the snake. Hence it emerged that sexing errors in males can actually be diagnosed at the insemination stage as a second-best alternative to probing.

As a result of this incident, measurements were taken on my three Collett's snakes to give accurate indication as to where "blocks" seemed to occur when a pipette was inserted through the vent. These were as follows:

Female: 151 cm total length, 18 cm tail, 133 snout–vent, 3.8 cm depth of pipette to "block" point.

Male (1): 169 cm total length, 20 cm tail, 149 cm total length, 5 cm depth of pipette to "block" point.

Male (2): 152 cm total length, 18.5 cm tail, 133.5 cm snout–vent, 5 cm depth of pipette to "block" point.

Similar data came from taxa such as red-bellied black snakes and tiger snakes, hence giving a secondary means for sexing snakes and raising potential indicators of sexing errors if the pipette passes further than expected before reaching a "block."

These sexing errors are mentioned here to serve as a warning to budding breeders who are not totally certain of the sexes of their reptiles. It may also be medically significant to the reptile if a sexing mistake is made.

Probing snakes

Most herpetologists are familiar with probing of snakes as described by Hoser (1989). The probes, of varying sizes, are usually metal rods with a ball at the end. The one used is that which is of appropriate size to fit comfortably into the hemipenal pocket, with a ball at the end of sufficient size so as not to "spike" the end of the hemipenis if it actually travels that far.

Probing a snake is a delicate operation and should be done with the utmost care and precision as it is easy to injure the soft tissue of the hemipenes, or corresponding tissue in females. As a rule, the probe should not be inserted the full depth of the hemipenal pocket as that is rarely needed to accurately sex the squamate. I have seen many snakes probed by novices that have sustained injuries (sometimes eventually fatal) from probes going through one or the other hemipenis. Once the probe has been inserted to a point where it is clear the depth indicates the sex as male (say about 7 scales down for most snakes), there is no need to push the probe further.

Due to the fleshier tail in lizards, probing is often more difficult, due mainly to difficulty in finding the position of hemipenal pockets, but the underlying principles are the same as for snakes.

A naming issue

While this paper has labeled the methods used as "artificial insemination," the only artificial stage of the process is in terms of the acquisition of semen and then its implanting in the female. An alternative name for the process is therefore "assisted insemination." For humans and other animals, artificial insemination or "AI" sometimes refers to the actual process of conception (sperm penetrating egg and fertilizing it) in a non-natural environment such as a petri dish, as opposed to human movement of semen.

Viewing semen under a microscope

If you use the methods described in this paper, it isn't usually necessary to view the semen under a microscope. As already mentioned, if the reptiles have been subjected to a correct temperature regime over the preceding year (in terms of inducing mating and breeding) and there are no contra-indications, then it's reasonable to assume that the males carry viable semen and sperm.

However, if you do intend to view semen under a microscope the recommendation is to retrieve and view the sample without any delay, so as to avoid drying. A day-old sample or slide presents a very different view to a fresh sample. Of note has been the strong variation in shape and form of spermatozoa between taxa. The appearance of spermatozoa also varies depending on the resolution of the microscope and the preparation of the slide. As a rule, stained slides make the individual spermatozoa easier to see and identify.

At lower resolution (say around 100 ×), the semen gives an appearance of being striated in texture. The striations are usually caused by the tails of the individual spermatozoa. At higher resolution (say around 400 ×), the individual spermatozoa are delineated, including the head and tail. However due to the nature of a microscope's focusing, most spermatozoa will not be visible, with the resultant view being a combination of heads and tails, with few if any complete spermatozoa being visible. Most standard optical microscopes have resolutions of 100 × and 400 ×.

In terms of slide preparation, the general recommendation is to smear the subject material very thinly over the slide, so as to yield a "single layer" before placing on the cover slip. Dilution in water or dye (methyl blue, one droplet is more than enough) may assist for several reasons, including delaying the inevitable drying of material under the slide.

As it happens, none of these methods are mandatory in terms of observing semen. Semen is actually easy to place on a microscope slide and also easy to view due its light colored texture (whitish to translucent).

If the spermatozoa present as evenly distributed, it is reasonable to assume that the sperm is viable. If they are clumped, they are likely to be unviable or dead. Such clumping is seen in slides from old and dried hemipenal plugs often shed by snakes routinely and also shed prior to the yielding of fresh semen at time of masturbation.

If desired, and if only one snake (or lizard) is to be inseminated, it is routinely possible to use one semen sample to inseminate the reptile, and if this works according to plan, then use the other for microscopic analysis. This may give a better indication of likely success of the insemination.

Advantages of AI over "natural conception" in the captive reptile situation

Obviously in cases where snakes won't otherwise copulate, there is no contest in terms of comparing the methods of conception. In cases where a pair of snakes may naturally mate, use of AI has questionable benefits and it is here that a judg-

Red-bellied black snakes mating on a table at the Tuggeranong Hyperdome Shopping Mall in the Australian Capital Territory. Photograph by the author.

ment call needs to be made. If the mating is deemed likely, AI is redundant. This happened with two out of three pairs of eastern brown snakes. Two South Australian eastern brown snakes (a male and female) failed to mate and nothing I tried seemed to be able to induce a mating. The female was therefore inseminated and became gravid with fertile eggs.

Unlike previous years, in spring 2007 I was unable to get either of my male red-bellied black snakes to mate, so chose to use AI on the female. Some weeks after the AI, the three snakes were taken to the Tuggeranong Hyperdome Shopping Mall in the ACT. While being held in a box together, the two males apparently attempted a "threesome" as they tried to mount the female and one another. One of the males was removed and within minutes the other male had "locked up" as in commenced copulating the female.

This remained the case from 12 noon through the next on stage show at 1 P.M., where the snakes were held and demonstrated as mating to the audience of many hundreds, and through the afternoon and into the night, at which stage the two snakes remained in a box in a nearby motel room. In this case and with the benefit of hindsight, my early call to do AI on the red-bellied black snakes was probably unnecessary.

Because it is routine to be able to tax a male snake for semen and successfully impregnate the female within minutes, with no pain or suffering for any party, AI becomes a compelling alternative for natural conception methods for a sizeable proportion of captive reptiles. At our facility, for the 2006/7 season, most (but not all) breedings will be from AI, and we have had to get a new incubator to deal with the expected rush of eggs.

In terms of masturbating snakes to extract semen, this method is also useful to determine the likelihood of whether or not a given male snake will be inclined to mate. Consistent failure to get semen (assuming you know how to properly masturbate the snake) and assuming that the snake hasn't recently mated or been taxed for semen, has been shown to be a reliable indicator that the snake won't mate or produce offspring (at least in the short to medium term). This is a useful technique for potential reptile breeders with large collections of given species, who may be considering which individual snakes (or lizards) to cull from the collection.

Benefits (and negatives) of the methods described above

At our facility the use of AI manifests as more gravid snakes than would otherwise be the case. Using the method described in this paper, over ten snakes of various taxa (elapids and pythons) as well as numerous lizards from all Australian families (excluding pygopodids) have been successfully inseminated and either produced fertile eggs or young, or are due to by early 2008. Most would not have bred otherwise.

For the record, masturbating pygopodids for semen was trialed on a single male *Delma inornata* with success, but the semen was discarded.

Artificially inseminated snakes . . . the new venomoids?

While the first successful AI was done with venomoid Collett's and brown snakes and in its first wide application, venomoids of various taxa were the main players, the method is probably usable for all squamates. Because it is so unbelievably simple and effective, there is no doubt that some people will have doubts about the methods described here.

The saying "it's too good to be true" will be used. "Why hasn't this been done on a wide scale sooner?" Fuel to this fire will be added by the usual band of critics who complain about anything "Hoser" (see Hoser, 2005a). It will be like the nonstop rants and false comments about the alleged death, destruction, pain and suffering of the Hoser venomoids, the originals of which are still thriving, mating and breeding four years after their venomoid operations! (again see Hoser, 2005a).

Done judiciously and properly and in circumstances where reptiles may otherwise not breed, AI as described here has no known or obvious downsides and yes, I've been looking hard for any.

There is however one potential criticism of AI which has a sound basis of fact, even if is not agreed with by a given person. Because AI enables transfer of semen from any reptile to any other, it makes the idea of hybridizing taxa simple. Formerly unobtainable hybrids or rarer ones (as seen in some pythons, e.g., female water python × male jungle carpet and female Australian scrub × male jungle carpet as seen in Hoser [1988]) can now be effectively manufactured on call. It is the removal of pre-mating isolation mechanisms that allows this possibility, and if there is opposition to hybridizing reptiles, this will most certainly manifest in the form of opposition to AI.

Having said this, Hoser (2005b) gave other previously unreported and unknown examples of a breakdown of pre-mating isolation mechanisms without any form of AI involving death adders, copperheads and tiger snakes. (Since that paper was published, we have witnessed male brown snakes and male copperheads try to mate one another, and also male red-bellied black snakes engage in combat with male eastern brown snakes at Tuggeranong Hyperdome, ACT, in October 2007, immediately before the male red-bellied blacks were then separated, placed with a female red-bellied black and then both were seen

trying to mount her in the above reported attempted "three-some.")

Hybrid reptiles are generally regarded as worthless here in Australia and in terms of pythons at least, they sell for less here than the pure-breds. In the USA the picture is mixed, with some of the more unusual hybrids such as "carpondros" (green pythons crossed with carpet pythons) selling for huge prices. With AI making these hybrids theoretically accessible to more people, it is likely that after an initial rise and spike in the number of hybrids, the novelty will wear off and AI's main long term application will be simply for breeding rarer and harder to breed taxa or for facilities such as ours where the keeper does not hold large numbers of given taxon and has a greater dependence on single individual reptiles for breeding success.

The main features of AI as detailed here in its wider application will be even more captive breeding of reptiles, a corresponding drop in retail prices for private keepers and better still a direct reduction in pressure and exploitation of, potentially limited wild stocks.

Acknowledgments

Reptiles detailed in this paper were held and moved under various permits and acquired from several sources. In all cases, state wildlife authorities issued permits and movement advices promptly when asked and as always this is appreciated. Individuals who supplied snakes and lizards referred to in this paper, or held at the same time and inspected, but not referred to here include the following: Scott Eipper, Adam Elliott, Paul Fisher, Robert Gleeson, Ian Renton, Federico Rossignolli, Alex Stasweski, Peter Whybrow, Drew Williams, Andrew Wilson and several others. Several veterinary surgeons supplied equipment, advice and the like for the above reptiles, but as a result of criminal threats made against one in relation to the Hoser venomoids in 2006, their names are not published here.

End note

All procedures described herein have been conducted with veterinary supervision. All snakes identified as "Hoser venomoids" as defined herein have been certified as permanently devenomized a number of times by a licensed practicing veterinarian to satisfy demands of licensing authorities and other government entities (including for example Worksafe Victoria) in more than one Australian state.

Literature Cited

Hoser, R. T. 1988. Hybridisation between three different species of Australian python. Litteratura Serpentium (Holland), 8(3):134-139.

————. 1989. Australian reptiles and frogs. Mosman, New South Wales, Australia: Pierson Publishing.

————. 2004. Surgical removal of venom glands in Australian elapids: The creation of venomoids. The Herptile 29 (1):37-52.

————. 2005a. Surgically enhanced venomous snakes. Venom glands out, silicone implants in! The creation of perfect exhibition snakes in the post HIH era. Crocodilian — Journal of the Victorian Association of Amateur Herpetologists 5(2):17-28 (August) and 5(3):30-36 (November).

————. 2005b. Pecking orders in large venomous snakes from south-east Australia: Ecological and distributional implications. Boydii (Journal of the Herpetological Society of Queensland), Spring: 33-38.

————. 2006. Successful keeping and breeding of Eastern Brown Snakes (*Pseudonaja textilis*) including an assessment of previously documented failures and reasons for them. Crocodilian — Journal of the Victorian Association of Amateur Herpetologists 6(2):16-28 (August).

————. 2007. Garbage guts — Australian Tiger Snakes. Reptiles (USA) 15(3):48-60 (March).

The New President's Short Rant. Happy New Year!

John Archer
jarcher1314@sbcglobal.net

I hope that your holidays were happy. The December meeting was fun for me: lots of chatting and eating, most of the time not both at once, and meeting new members. Many members brought their animals, and Dan Nathan especially outdid himself, bringing many of his iguanas and his extraordinary cages and playpens. Ralph Shepstone even brought one of his fun field videos. Josh Chernoff was nice enough to conduct the raffle. Food, friends, laughter and animals. What more could one want during the holidays? Well, booze, but we are a family organization, and I didn't really miss having alcohol. Honest. No kidding. Er, only a little.

Of course, we had no speaker, so that means that I can't write my regular column, but I thought that you might want to hear something from the new president. I'll try not to bore you, but now that I have the bully pulpit, I do have a few things to bring to your attention. You're a member of an extraordinary organization that's been well known and respected by the herpetological community for more than forty years. I'm going to do my best to continue that tradition, but no one person has made this society what it now is, and certainly no individual will carry it into the future. This society belongs to you. Not to the board, not to the members that are always at the meetings, not to the members who donate their time and energy toward the many tasks that keep this organization running. It's yours. What are you going to do with it?

If this sounds like the beginnings of a guilt trip, you're wrong. I don't respond particularly well to guilt, so I don't expect others to respond well to guilt. I am asking you to think about what the CHS means to you and what you might mean to it. We all have busy lives, and the people I meet in this organization don't seem to be one-dimensional, with herps as their only interest (well, most of them anyway). I'm always astounded by the diversity of our membership. So we all have other things to do, but if this society is worth anything at all to you—and you're a member so it's at least worth your dues—you need to start telling your officers where you want this society to go (if you're telling them where to go, be polite). Cliché though it may be, everything changes, and this society will change. It may be worth your time to email an officer and let them know what you don't like or what great idea you have for taking this organization into the twenty-first century. It may be worth your time to offer to help with various projects. It may only be worth your dues. Only you can judge that, but I am asking you to decide.

I have some rather simple goals that I want you and the board to consider:

- I would like to upgrade the web site. I believe that the internet is vital to the society's future, and I'd like our web site to reflect the quality of our group.
- I think email should play a larger part in our communications with you because I think that a reply to an email is relatively easy, and that may encourage more feedback from you.
- I want to see the society get more publicity, because I think our mission is important, and we need the public to be aware of and appreciate our goals.
- I'd like more of you to get involved, even on the most basic levels of sending emails telling me what a dork I am (my children claim that the use of that word identifies me as one), but we always need people to take on projects that vary widely in their complexity and duration.

None of this wish list of mine is any different from any other organization to which you belong, for-profit or non-profit. So what's the difference in this message? How do I talk you into giving some time to this society rather than the others to which you belong? I don't know. But this work will probably be more fun than other work you might be asked to volunteer; it deals with herps! And the paybacks can be large. You'll be involved with a diverse group of active, intelligent, and committed people who are a lot of fun to be around and can expose you to experiences that you will not likely find elsewhere. I'll try to stay out of the way.

So here's the first small request that everyone who has a computer can spend a few minutes doing. Log on to our web site and test the links. If one doesn't work, email webmaster Chris Lechowicz so that he can fix them or take them down. You'll get a weird anti-spambot message requiring you to do nothing more than reply to it the first time you correspond with him. After that all your communications will be normal. Check out a few of the links that are not immediately accessible. Probe around a little. If each one of you finds and identifies a broken link, we can be on our way to having a web site that has the credibility enjoyed by our organization.

Register for our new forum. Jason Hood has done a good job of setting this up with Chris. It's new and easy and has the potential to allow our more distant members to interact easily with others in the CHS. And for those of you in the local area, come to the meetings and get to know people. If you can, get involved in ReptileFest, which is becoming a larger and more professional event every year. Last year over 4,500 people came to learn and have fun. Do all this because you'll have a good time, you'll probably learn new things, and many of the rewards will be instantaneous. If none of this appeals, at least email me and tell me what a dork I am.

Herpetology 2008

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.

GET AN EYEFUL OF THIS

W. Wüster and D. G. Broadley [2007, Zootaxa 1532:51-68] use multivariate morphometrics and mitochondrial DNA sequencing to investigate the systematics of the spitting cobras of eastern Africa, and describe a new species of giant spitting cobra, *Naja ashei*, from eastern and northern Kenya, southern Ethiopia, southern Somalia and eastern Uganda. The species was previously regarded as a large, brown color phase of the black-necked spitting cobra, *N. nigricollis*. However, mtDNA sequence data show it to be more closely related to *N. mossambica* than *N. nigricollis*. The new species is diagnosable from all other African spitting cobras by the possession of a unique clade of mtDNA haplotypes and a combination of color pattern and scalation characteristics. It differs from East African *N. nigricollis* in aspects of pattern (light venter, brown dorsum, no black scale edges on lips or ventrals, no well defined dark band on neck) and scalation (combination of high ventral scale counts [> 195] and dorsal scale rows [21+ around neck]). The new species is notable for its large size (specimens measuring 200 cm are not unusual) and its large venom yield. The authors dedicate this species to the memory of the late James Ashe (1925–2004), founder of the Bio-Ken Snake Farm.

HABITAT USE BY NATIVE RED-LEGGED FROGS AND INTRODUCED BULLFROGS

D. G. Cook and M. R. Jennings [2007, Herpetologica 63(4): 430-440] quantified frog phenology and microhabitat use of the native California red-legged frog (*Rana draytonii*) and introduced bullfrog (*Rana catesbeiana*) in an 11-ha seasonal marsh, Sonoma County, California. Logistic regression showed that both species selected habitats nonrandomly from among the available habitats in the marsh. As adults, the two species overlapped in their habitat use, selecting dead spikerush in winter and spring, and aquatic buttercup in summer. Although the model emphasized overlap in frog habitats, there was more separation in habitat use between species during winter (when most bullfrogs were hibernating) than other seasons. The egg-laying habitats and seasons differed dramatically between the two species. Red-legged frogs bred in winter almost exclusively in shallow dead spikerush and bullfrogs in spring and summer in deeper areas with dense cover, predominantly smartweed. Breeding periods of red-legged frogs and bullfrogs were separated by 10 wk, which coincided with peak adult abundances. The authors suggest that the separate reproductive seasons may reduce competition and predation by bullfrogs on red-legged frogs, allowing for coexistence. Furthermore, the marsh's late-season drying limits metamorphosis of bullfrog tadpoles, which usually require permanent water. The marsh's seasonal hydrologic pattern offers a model for habitat in which the native red-legged frog may persist despite negative interactions with the introduced bullfrog.

SUSTAINABLE HARVEST OF YELLOW ANACONDAS?

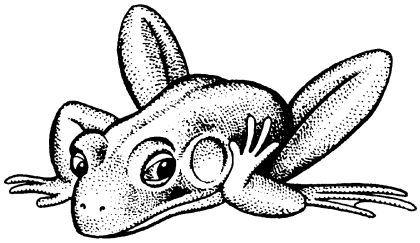
P. A. Micucci and T. Waller [2007, Iguana 14(3):161-171] describe a program for the sustainable utilization of yellow anacondas *(Eunectes notaeus)* that was implemented in 2002 in the Province of Formosa, Argentina. The management plan was conceived to manage an activity that had been misusing a valuable wildlife resource with no regard for existing regulations. Delimited hunting areas were assigned to a restricted number of local skin buyers (LSB). A LSB is authorized to acquire hides from enrolled hunters living or working in an assigned territory; overlap of areas among buyers is discouraged and regulated. A minimum size limit of 230 cm was established for skins, while annual changes in skinning patterns ensure that hunters or LSBs do not stockpile hides from one year to another. Sustainability is regulated by examining hunting effort in relation to catch-per-unit effort and monitoring traditional parameters like sex, origin and size structure of the skins harvested. About 15% of the program's gross revenue goes to cover program costs, whereas 13% goes to community members. Quantitative harvest data from the first five years are presented and discussed.

YELLOW-LEGGED FROG DEMOGRAPHICS

K. R. Matthews and C. Miaud [2007, Copeia 2007(4):986-993] used skeletochronology to determine the ages of 149 (74 females, 44 males, and 31 juveniles) mountain yellow-legged frogs (*Rana muscosa*) from 13 locations (elevation 1509–3501 m) throughout their current range in the Sierra Nevada Mountains of California. Lines of arrested growth (LAGs) from excised toe bones were distinct in these high elevation frogs, and each LAG was assumed to represent one year of age. Females ranged in age from 0 to 10 years (mean = 4.1 years) and males from 0 to 8 years (mean = 4.0 years). The skeletochronological age was that of the post-metamorphic frog and did not include the tadpole stage. Mountain yellow-legged frogs spend 3–4 years as tadpoles, but no age markers are found in their cartilaginous skeletons; thus, if both tadpole and post-metamorphic stages were included, total age would range up to 14 years. Females were significantly longer (snout–vent length: SVL) than males and had greater mean mass, but there was no difference in the mean ages. Juvenile frogs of unknown sex ranged in age from 0 to 3. A growth curve demonstrated that female SVLs were larger than males' for all ages. The authors also found that elevation was an important variable in the relationship between SVL and age; frogs from lower elevation sites were consistently larger at a given age when compared to higher elevation sites. For each increase of 1000 m in elevation, the estimated length (on average) decreases by 8.7 mm. This is the first age determination study of a Sierra Nevada amphibian, and compared to other anuran species, mountain yellow-legged frogs were found to be relatively long-lived, which will have implications for restoration and recovery plans.

The Tympanum

Online buyer's guide to ethical, conservation-minded suppliers of turtles and tortoises



This is to inform hobbyists of information now available providing reliable sources for purchasing captive-bred turtle and tortoises.

As of 1 January 2008 a list of six recommended turtle and tortoise breeders providing over 190 species and subspecies is available on line. We anticipate that our list of recommended suppliers and the number of species available will be forever growing. Direct contact information is on The Tortoise Reserve web site. Go to www.tortoisereserve.org. Look under Recommended Sources for Captive-bred Turtles and Tortoises.

Prior to purchase please consider adoption. There are numerous turtle and tortoise rescue groups throughout the country who have all sorts of turtles and tortoises available for adoption. We can place you in contact with them.

Why buy captive-bred turtles and tortoises?

Unbelievable numbers of turtles and tortoises are removed from the wild each year for the pet trade. Two-thirds of the world's turtles are currently threatened or endangered and for many species their mass exploitation for use as pets has become a major conservation issue. Globalization has accelerated the problem exponentially and wild-caught turtles are now being exported to the United States in record numbers. Most turtles and tortoises are long-lived but have very limited annual reproductive output and because of this populations seldom rebound from extensive commercial harvest. By purchasing only captive-bred turtles and tortoises the buyer is not contributing to the continual decline or supporting the trafficking of these gentle and lovable reptiles. Each captive-bred turtle purchased is like buying two, the one you have and one that, because of this, can remain wild.

As a secondary benefit to purchasing captive-bred animals from reputable breeders the buyer is assured of acquiring a healthy animal. Wild-caught turtles and tortoises often support heavy populations of parasites, and both internal parasites and various diseases and typically get out of control as a result of handling, shipping and being held under stressful and unsanitary marketing conditions. Additionally, as a captive-bred animal the turtle's exact age will be known, a useful piece of information for a long-lived pet that may be passed through more than one generation of your family. In that the breeders are experts on the species they work with, and concerned with the long-term welfare of the turtles they produce, they are happy to advise you on all aspects of your turtle's needs.

Some real issues!

Many dealers are passing off wild-caught turtles and tortoises as captive-bred individuals, while others being imported from foreign countries are labeled as captive-bred when actually they were wild-caught or hatched are from eggs removed from turtles butchered for food.

Some commercial farms that are breeding turtles en masse for the pet trade (in this country mostly sliders and map turtles), also supply small numbers of other species to the pet trade. Often hybrids are sold as recognized species. The mass produced turtles become disposable pets, and those that live are often later dumped into aquatic systems where they compete and hybridize with native turtles and they can possibly spread exotic diseases into local waters. Consumer support of these operations is ill advised.

Imported turtles, and those farmed en masse, typically are exposed to extended periods of poor and inhumane treatment. This in turn results in high levels of mortality. One typical trick-of-the-trade is to keep newly hatched turtles in refrigerators for half a year or more. Once that year's hatch is sold off they are then put on the market at a higher price. A huge percentage of these refrigerated turtles die within a few months after being sold due to dehydration. One dealer is selling genetically blind red-eared sliders as pets. These blind turtles actually have a higher asking price than normal ones sold by the same dealer.

Dealers that supply both wild-caught and captive-bred turtles and tortoises are not contributing to conservation as profits from sales are frequently rolled over to purchase imported and locally wild-caught species.

There are all types of legal issues with wild-caught turtles. Different states and countries each have different laws and regulations which are frequently broken somewhere in the long chain that extends from the collectors to distributors, exporters, importers, dealers, and retail sales. Purchasing directly from reputable private breeders removes any question of doubt regarding the origin or legality of the purchase.

The reasons particular turtle and tortoise breeders are recommended

- We personally know these private turtle and tortoise breeders to be reliable, honest, and that they sell only species they actually breed themselves.
- They all live in the United States so import permits are not an issue.
- All sales are legal and none of the people listed here have ever been charged with breaking federal of state wildlife laws.
- The turtles they sell and their parent stock are all housed in healthy and humane conditions.
- They all guarantee the health and condition of individuals sold, know shipping regulations, and pack turtles for shipment so that live arrival is guaranteed.
- Each of them has been involved in breeding captive turtles and tortoises for decades. They are knowledgeable, will be

able to answer questions regarding your purchase, and will be glad to help you with any problems you may have in the future.

• These breeders are well known individuals and we expect they will be in the business for decades to come; they are unlike people you encounter on internet sites who disappear within 48 hours of selling off groups of exploited animals.

Removing creatures from the wild for profit is one of the worst forms of vandalism; legal or not, it's unethical. Do not support the commercial trade in wildlife by purchasing wild-caught turtles. Buy only captive-bred turtles and tortoises, and by purchasing directly from reputable breeder you and the turtles bypass a whole string of middlemen and commercial reptile dealers. **David S. Lee, The Tortoise Reserve, Inc., PO Box 7082, White Lake, NC 28337; Torresinc@aol.com**

Unofficial Minutes of the CHS Board Meeting, December 14, 2007

The meeting was called to order at 7:52 P.M. at the home of Gary Fogel. Board members Rich Crowley, Kira Geselowitz, Deb Krohn, Jenny Vollman and Erik Williams were absent.

Officers' Reports

Recording Secretary: Mike Dloogatch read the minutes in Kira Geselowitz's absence and they were accepted.

Treasurer: Andy Malawy reviewed the November financial reports. ReptileFest 2007 will make the year a great success financially for the CHS.

Membership Secretary: Membership is up for December and failed renewals were shared with the board. Total membership is about 575.

Vice-president: We should have a fun meeting this month with the Christmas party. Final arrangements for food are made.

Sergeant-at-arms: Attendance at the November Elections Meeting was 48.

Committee Reports

Shows:
• I Love My Reptile/Turtle magnets are available at most of the shows we will be at. We are looking at making the Spot books available there as well.
• Peggy Notebaert Nature Museum: We have a contract pending, looking for the dates at the first weekend of each month.
• Lake County Reptile Show went well. Some magnets were sold.
• Great Lakes pet expo coming up February 2, 2008, at the Wisconsin State Fair Park. If interested in volunteering for the CHS booth, please contact Cindy Rampacek.
• ReptileFest: We are looking at having T-shirts available for certain volunteers to help identify them when needed at the show. We are also working on fliers. If you are interested in handing out ReptileFest cards, please contact John Archer.

Raffle: The raffle has been doing well, but as always we need donations. If you have supplies that you are not using, please speak with Josh Chernoff to arrange donation to the raffle. Remember this is a tax-deductible donation.

Library: We purchased the second edition of *Reptile Medicine and Surgery* by Douglas R. Mader and *Homalopsid Snakes: Evolution in the Mud* by John C. Murphy.

Conservation: Steve Sullivan reports that U.S. House Bill 3036 would offer additional funding to states that participate in the No Child Left Inside program . Chicago Wilderness is looking for stories about kids involved with conservation and outdoors projects. Cindy Rampacek reports that land in Guatemala has been secured for the Guatemalan beaded lizard and the Guatemalan black iguana. This is a partnership program in conjunction with the IRCF, Zootropic and Zoo Atlanta.

Grants: In view of our favorable 2007 financial results we should be able to fund more grants in 2008. The exact amount will be determined by the 2008 board.

Old Business

2010 Midwest Symposium: We are currently working to come up with a date.

New Business

Board Meetings: Meetings in 2008 will be held at the Schaumburg Township District Library on the second floor. This meeting space is available for free to us. Meetings will start at 7:30 P.M. on the Friday evening 12 days prior to the last Wednesday of the month. All members are welcome. The address is 130 S. Roselle Road, Schaumburg, IL 60193.

Dottie Humbert donated Ron's old herp T-shirts to the CHS for future use.

Round Table

Dick Buchholz will be in Florida for the Christmas meeting and we wish cold and rain upon him.

Steve Sullivan would like to thank everyone serving on the board this year.

Jason Hood is looking for speaker suggestions for the upcoming year.

Cindy Rampacek announced that she and her husband got a 16-week-old pit bull puppy for Christmas.

The board would like to thank Gary Fogel for opening his wonderful home to us for this meeting.

The meeting was adjourned at 9:50 P.M.

Respectfully submitted for the Recording Secretary by Cindy Rampacek

Chicago Herpetological Society
Income Statement: January 1 – December 31, 2007

Income		Expense	
Adoptions	$ 1,215.44	Adoptions	$ 1,274.82
Grants	124.00	Grants	2,150.00
ReptileFest	37,774.60	ReptileFest	22,411.16
Other CHS Shows	4,021.00	Other CHS Shows	435.91
CHS Group Trips	250.00	CHS Group Trips	200.00
Merchandise Sales	1,653.80	Merchandise Sales	1,982.89
Conservation — Massasaugas	40.00	Conservation — Massasaugas	0.00
Conservation — *Cyclura*	30.00	Conservation — *Cyclura*	0.00
Membership Dues	14,610.36	Printing / Duplicating	11,361.59
Contributions (unrestricted)	546.00	Addressing / Mailing Service	2,164.79
Amazon.com	87.86	Membership Brochures	230.00
Bulletin Ads	550.00	Awards	200.77
Bulletin Back Issues	40.00	Bank Fees	22.36
Interest	1287.42	Donations	38.00
Raffle	1111.00	Liability Insurance	5,351.00
Miscellaneous	30.26	Library	248.83
		Licenses and Permits	68.00
		Postage	2,146.41
		Speaker Reimbursement	1,985.81
		Telephone	249.07
		Miscellaneous	75.00
Total Income	$63,371.74	Total Expense	$52,596.41

Net Income $10,775.33

Chicago Herpetological Society
Balance Sheet: December 31, 2007

Assets	
Checking	$ 5,034.68
Money Market	36,526.58
Total Assets	$41,561.26
Equity	
Restricted – Adoptions	$ 5,760.87
Restricted – Grants	42.00
Restricted – Massasauga	356.00
Restricted – *Cyclura*	321.00
Restricted – CIG	405.00
Retained Earnings	23,901.06
Net Income	10,775.33
Total Equity	$41,561.26

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*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. PO Box 85, Alpine TX 79831. Call **toll-free** at (800) 720-0076 or visit our website: < http://www.themousefactory.com> .

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: Graptemys.com T-shirts, 100% cotton, pre-shrunk, pigment-dyed shirts with the Graptemys.com embroidered logo. These are very high quality shirts with that stylish faded look. Sizes S-M-L-XL-XXL. Colors: Pacific blue, nautical red, brick red, plum, granite, khaki green and putty. All profits made from these shirts goes directly to in situ *Graptemys* research. $20 each with $3.00 shipping. Email: chris@graptemys.com or call (239) 437-4148 to order. You can look at the shirts at http://www.graptemys.com/shirts.htm

For sale: books. Carr, Archie—*The Reptiles*, 1977 (1963), 192 pp., many color and b&w photos, drawings, part of Life Nature Library series, well written book by this noted herpetologist and excellent writer, hardbound, $9; Kauffeld, Carl—*Snakes: The Keeper and the Kept*, 1969, 248 pp., 39 b&w photos, husbandry information and the author's adventures looking for snakes (particularly rattlesnakes) in Arizona, Texas, New York and South Carolina, previous owner's name inked out inside front cover, DJ slightly frayed on top of spine, mylar covering on DJ, hardbound, $52; Bredl, Rob—*The Real Crocodile*, 1993, 24 pp., many b&w photos, author's attitudes towards and experiences with Australian crocs (Rob and his herpetologist father, Joe, have operated fauna exhibits in Australia for many years), softbound, $15; Dixon, James R.—*Amphibians and Reptiles of Texas* with keys, taxonomic synopses, bibliography (32 pp., literature from 1852-1982) and distribution maps, 1987, 434 pp., 25 b& w photos, softbound, $15. All books are in excellent condition except as noted. Subject to prior sale. $2.50 postage and handling for orders under $25, free for orders of $25 or more. William R. Turner, 7395 S. Downing Circle W., Centennial, CO 80122; telephone (303) 795-5128; e-mail: toursbyturner@aol.com.

For sale: Well started normal and spider morph ball pythons (*Python regius*) available for free delivery in the Chicagoland area—2007 normals $20 and spider males $350. I will consider trades for a mojave morph ball python. Also available are high-contrast, Sarawak Locality and Walnut × Sarawak pairing Borneo pythons (*Python breitensteini*). Pricing is based on male sex with $50 more for females, if available: 2007 high-contrast, $150; 2007 Sarawak, $175; 2006 Sarawak, $200; 2007 Walnut × Sarawak (melanistic Borneos), $125. All feeding on frozen thawed adult mice and/or rats. Shipping available as an additional cost, if needed. Contact Rich Crowley at 708-646-4058 only (at this time since I am in transition with internet service providers.)

For sale: I am trying to downsize my collection as I move into my new apartment in Chicago and am looking to sell two of my more recent acquisitions. Both are about 2 years old now. I have a female Chihuahuan mountain kingsnake (*Lampropeltis pyromelana knoblochi*) for $100 and a beautiful male jungle carpet python (*Morelia spilota cheynei*) for $200. Please contact me at (217) 390-7672 or mroconnoDVM@gmail.com if you would like to see pictures or purchase them.

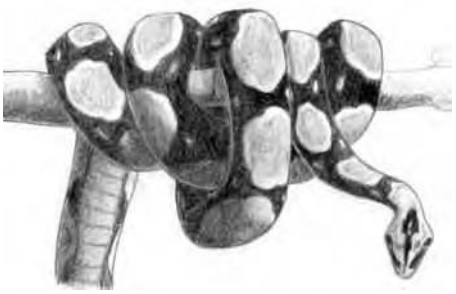
Internship available: The Kentucky Reptile Zoo, a nonprofit organization, is seeking student interns for the 2008 season. The zoo is an educational exhibit, venom production and research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions to the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition, the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern will **not** be involved in the handling of any venomous species. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis, ability to communicate effectively with people, writing skills, orientation to details, and self-motivation. The intern will be required to work Saturday and Sunday, with days off during the week. Students majoring in the biological or natural sciences are preferred. Interns are required to be either college students or recent graduates. Former interns have arranged for academic credit with their institutions. Benefits include experience with one of the most extensive and diverse collection of snakes in the United States, housing, and $55/week to cover expenses. Interns have been successful in finding zookeeper positions: over 95% hire rate! Personal transportation is recommended. A valid driver's license is required. Starting dates are flexible, but a minimum of three months covering spring (April-June) summer (June-August) or fall (September-November) is required. Deadlines are February 1 for spring, April 1 for summer and July 1 for fall. To apply, send a cover letter, resume, transcript, and at least 2 (preferably 3) references to: Kristen Wiley, Internship Coordinator, Kentucky Reptile Zoo, 200 L&E Railroad, Slade, KY 40376 or email to: reptilezoo@bellsouth.net.

Herp tours: Adventure trips to **Madagascar**! Journey somewhere truly unique to seek and photograph nature on the world's least-studied mini-continent. For maximum herp fun and discovery, join Bill Love as we go where few people will ever venture in their lives. Let his experience assure a comfortable tour finding the most colorful and bizarre species on the planet! Get all the details at Blue Chameleon Ventures' comprehensive new website: < http://www.bluechameleon.org> , E-mail: bill@bluechameleon.org, or call (239) 728-2390.

Herp tours: The beautiful Amazon! Costa Rica from the Atlantic to the Pacific! Esquinas Rainforest Lodge, the Osa Peninsula, Santa Rosa National Park, and a host of other great places to find herps and relax. Remember, you get what you pay for, so go with the best! GreenTracks, Inc. offers the finest from wildlife tours to adventure travel, led by internationally acclaimed herpers and naturalists. Visit our website < http://www.greentracks.com> or call (800) 892-1035, E-mail: info@greentracks.com

Virtual Museum of Natural History at www.curator.org: Free quality information on animals — emphasis on herps — plus expedition reports, book reviews and links to solid information. Always open, always free.

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: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com

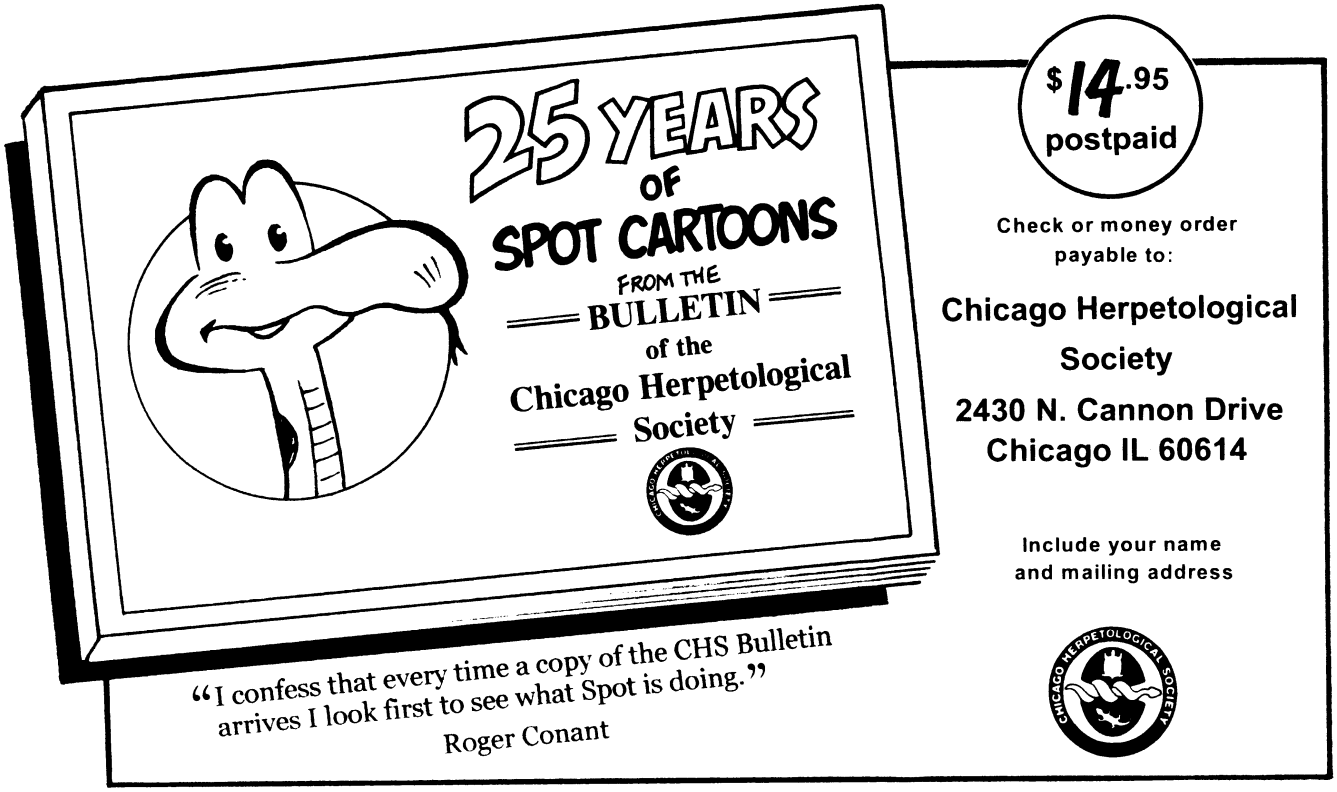


Whaddayagot?

Bringit!

ReptileFest 2008
April 12 & 13

Register online at ReptileFest.com or Chicagoherp.org



UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, January 30, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Dr. Zoltan Takacs**, research associate at the University of Chicago's Institute for Molecular Pediatric Sciences, will speak on "How the Cobra Escapes Its Venom." Hungarian-born, Zoltan has been fascinated by reptiles since early childhood and started to pursue venomous snakes at age 14, an addiction he never gave up. His main academic interest is the molecular basis of snake venom resistance—why cobras, sea snakes, and mongooses are not affected by elapid neurotoxins. A wildlife photographer, scuba diver, and aircraft pilot, Zoltan's quest for snakes has taken him to over 110 countries, and his work has been featured several times on the National Geographic Channel.

John C. Murphy will speak at the February 27 meeting on "Homalopsid Snakes and the Herpetofauna of Thailand." John, a past president of the CHS and a past editor of the CHS *Bulletin*, is a long-time educator, herpetologist, research assistant at the Field Museum, and author. His most recent book, *Homalopsid Snakes: Evolution in the Mud*, brings together important information and new knowledge about this fascinating group of snakes.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new 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., February 15, in the adult meeting room on the second floor of the Schaumburg Township District Library, 130 S. Roselle Road, Schaumburg.

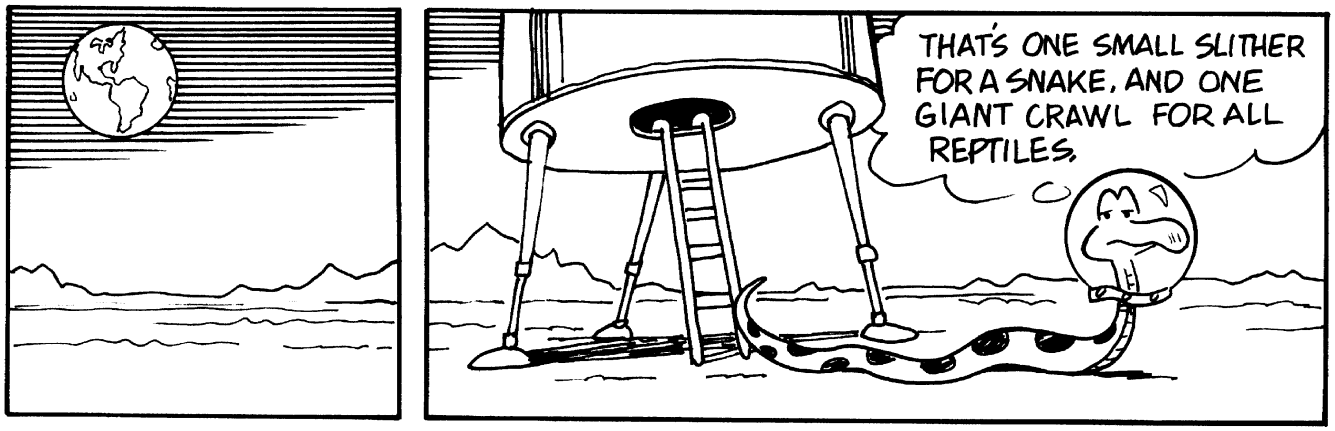
The Chicago Turtle Club

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.

REPTILE RAMPAGE 2008

Reptile Rampage 2008 will take place Sunday, March 9, from 10 A.M. to 4 P.M. at the Lake Forest Rec Center Gym, 400 Hastings Road, Lake Forest, IL 60045. The Rampage will be hosted by Lake Forest's Wildlife Discovery Center and sponsored by CroFab. Rob Carmichael, Curator of the Discovery Center, asks that you join him for this one-day event where many members from the Chicago, Wisconsin, and St. Louis herp societies will be showcasing an amazing assortment of reptiles for an educational exhibit. This is a great warm-up event for the greatest show on earth: the CHS's ReptileFest. Admission is $5; proceeds will go towards various herp conservation projects! For more info please contact Rob Carmichael at (847) 615-4388, or better yet, carmichr@cityoflakeforest.com. You can also check it out at www.girconservation.com.

THE ADVENTURES OF SPOT



Periodicals Postage
Paid at Chicago IL

CHICAGO HERPETOLOGICAL SOCIETY

Affiliated with the Chicago Academy of Sciences

2430 North Cannon Drive • Chicago, Illinois 60614