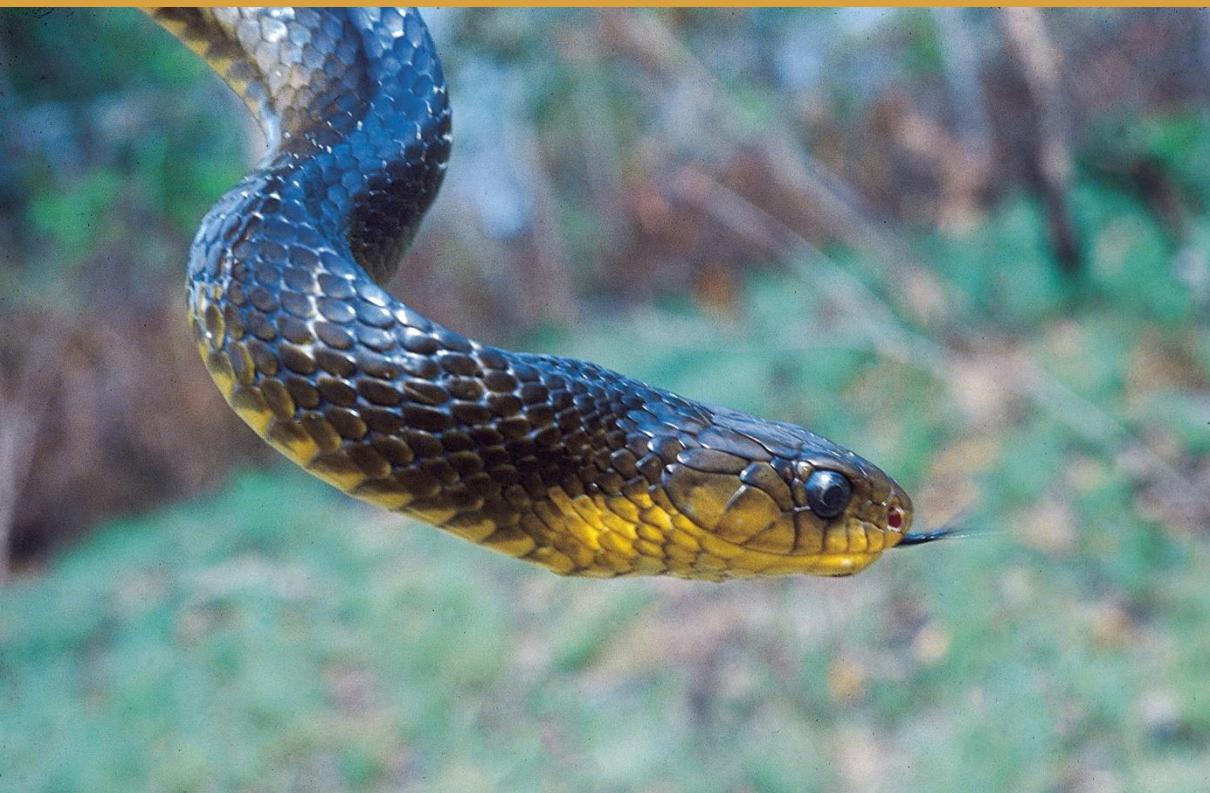


# 12

## Back to Alter do Chão



The yellow-tailed cobra, *Drymarchon corais*, is the most common species of large snake found in the savannas of Alter do Chão. Photo by Bill Magnusson.

I continued to study lizards at Alter do Chão and I usually carried a compressed-air rifle in case I needed to collect museum specimens. I was careful to get a police permit, even though you technically didn't need one for an air gun, and there were few restrictions on what you could carry on a plane in those days.

I was returning from a collecting trip in 1982 and arrived at the Santarém airport in pretty scruffy condition after camping in the savanna for a week. There was no one in the airport except the airline staff and they were surprised to see me. The attendant said in Portuguese "Don't you know that the flight has been cancelled? We called everyone."

I said that I had been in the field and out of contact, but at that moment the plane landed and the airport started to fill with serious-looking men in business suits. I pointed to the plane and the other passengers and said that the flight obviously hadn't been cancelled. The attendant looked worried and explained that the flight had only been cancelled for ordinary passengers because a delegation of the political party backed by the military government had said that they needed it for transport between Santarém and Manaus.

I looked around and said that there weren't that many politicians, I had to get back to Manaus that day, and that there was surely room for me on the plane. The attendant consulted with her supervisor and said that I might be able to board, but I would have to wait until all the other passengers were seated to make sure that there was space.

I sat on a hard-plastic seat and watched the men in penguin suits. Some were balding and potbellied and I assumed that they were the candidates. However, others were much younger, athletic looking and their eyes flashed around as though expecting an enemy attack at any moment. I assumed that they were body guards.



**Photo 12.1** A compressed-air rifle was essential for our studies at Alter do Chão, but I have never liked killing animals. Photo by Bill Magnusson.

The delegation filed out of the waiting room and, soon after, the attendant said that I could board. I felt strange walking across the empty tarmac in my scruffy field clothes and probably not smelling all that fresh. However, it was only when I entered the half-empty plane and all eyes were on me that I thought about the gun that I was carrying in a dirty cotton pillow case. I had taken off the barrel, but the shape of the stock left little doubt about what it was.

As I put the package into the overhead locker, one of the politicians leaned forward with eyes wide open, then turned and said something to the athletic man beside him. He started to get up and simultaneously all the younger men reached into their coats. Every eye was on me when the politician called over the steward and pointed to the locker.

The steward said in Portuguese “Excuse me sir, but what’s in that bag?”

I tried to be nonchalant as I replied in Portuguese “It’s just an, umm, errr, .... air gun.” I virtually whispered the last word but it seemed to ripple down the plane. All the presumed body guards leaned towards me clutching whatever was making the bulges under their coats.

The steward with eyes even wider than the politician said “I’m sorry sir, but we’ll have to dispatch it with the luggage.” He then picked up the cloth bag, holding it delicately balanced in two hands as though it were a baby or a bomb, and walked down the aisle. I gave a big smile to everyone on the plane, which got no response, then sat down and tried to look inconspicuous.



I became very attached to that air rifle. Although I don’t like killing animals, the gun became an essential tool. It had to be in perfect condition and do its job or I would lose a specimen or, worse still, maim it and make it suffer before I could dispatch it. In past times, collectors, such as Henry Walter Bates and Alfred Russell Wallace, made their living and attained fame largely because of their hunting abilities. I regarded the hunting as a necessity, and did not consider the gun as part of my personality, as occurs in the USA and some other ethically underdeveloped nations.



**Photo 12.2** Xavier Desmier, and Tânia Sanaiotti holding a yellow-tail cribo and a green vine snake at Alter do Chão. Photo by Bill Magnusson.

I realized the difference between a gun as a tool and a gun as an image enhancer when I was visited by a young French man, Xavier Desmier. He had been a member of Jacques Cousteau's Amazon expedition, which must have been one of the most memorable experiences possible for any young photographer. We had a good time together near Manaus during the expedition and he asked if he could return to photograph the animals we studied at Alter do Chão.

My mother had visited me some months earlier and left an Italian-made straw hat she used as protection from the tropical sun. I inherited her pasty complexion, so the hat was good protection for my nose. However, it had an added advantage. The straw brim could be flicked up to allow sighting down the barrel of a rifle. It therefore became my hunting hat.

Xavier planned to sell the photos to magazines that wanted Indiana Jones-style stories. I wasn't much to look at, but by getting the right angle Xavier could give the impression of a crocodile-Dundee character. That is, if I wasn't wearing a lady's Italian straw hat! It is good for your pride to have someone following you around to photograph you in heroic stances, but it can be a bit overwhelming. You don't have any privacy and it is disconcerting when you duck behind a bush to relieve yourself only to find that you are staring into a camera lens.

At first, I tried telling Xavier every time I wanted a bit of privacy, but that didn't work and seemed artificial. In the end, I found that the best thing to do when I didn't want to be photographed was to put on the straw hat. Xavier hated it and would wander away grumbling whenever I did.

Snake photographs are more appealing to adventure-magazine readers than lizard photographs, and the bigger the better. The yellow-tail cribo<sup>149</sup> is, apart from the boas, probably the biggest snake at Alter do Chão, and we wanted to catch one for Xavier. It looks like an Australian tiger snake and it is difficult for an Australian to lose the feeling that the big colubrids must be venomous, which they aren't. In fact, cribos are not only nonvenomous, they are extremely calm and reluctant to bite if you handle them gently.

I was walking through flooded grassland beside a lake when I saw a large yellow-tail cribo fossicking in the leaves and I ran up and grabbed it by the tail before it knew what was happening. It gave a few half-hearted attempts to swing around and then just hung limp in my hand. With its tail held above shoulder level, its head was touching the ground. I then slid one hand slowly along its belly and grabbed it around the neck. Its attempts to pull out of my grip were feeble and it ended up just curling around my forearm like an oversized bangle.



**Photo 12.3** Jeni Magnusson pointing out something interesting on the way to the campsite at Alter do Chão in 1995. In the background, her father is using the “hunting cap” Xavier hated. Photographer unknown.

Happy with my capture, I decided to cut across a flooded section to get to the track that would take me back to camp. Another snake of the same size was swimming through the grass and I ran after it and grabbed its tail. It wasn’t, however, a yellow-tail cribo, it was a false water cobra<sup>150</sup>. These snakes are mildly venomous, but more importantly they have a powerful bite and the habit of hanging on if they do manage to sink their teeth in. As I had the cribo in my right hand, I was trying to shake the false water cobra down by flicking my left wrist, as I would have with an Australian elapid.

The snake I had in my left hand, however, was nothing like the cribo or other snakes I had grabbed by the tail. It flung itself upwards and its jaws were snapping shut near my ears and nose. My shaking had no effect except to put off

its aim by a few inches, and it was obvious that I had to do something different or take a bite to the face. Therefore, I started to spin around, relying on the centrifugal force to keep its head away from me. It worked, and the snake could not swing more than half way back towards me as I spun around.

That is, it worked for a while, but as I spun waiting for the snake to tire, I started to lose focus and my spinning left me so dizzy that I started to stumble through the grass and fell flat on my back into the water, letting go of the snake, which was thrown into the bushes and made its escape. When I finally got my bearings again and looked around, I was surprised to see that I still had the cribo wrapped around my wrist. I hadn't hurt it and it hadn't escaped. When the wooziness subsided, I decided that Xavier didn't really need to photograph a false water cobra and I took the cribo back to camp.

As far as I know, Xavier never published any stories about Alter do Chão. He is still a professional photographer and has received many awards, including Wildlife Photographer of the Year in 2012. You can visit his site<sup>[151](#)</sup> to see his current work. However, he says that the life of a photographer is not easy these days. The digital-photography revolution upped the ante and even amateurs like me can take very good photographs, much better than professionals could produce in the 1980s. To be at the top means that just being spectacular is not enough; today his photographs really have to be outstanding - and they are!





**Photo 12.4** Liliana de Paiva with a yellow-tail cribo. These snakes have a disconcerting similarity to Australian tiger snakes, but are harmless to humans and generally very calm when captured. Photo by Bill Magnusson.

When we submitted the paper on lizard foraging, I included a statement that most of the lizards were adults at the time of the study because of seasonal reproduction, and one of the reviewers insisted that I take it out because Laurie Vitt had shown that teiids had unseasonal reproduction in the Brazilian northeast. I was annoyed that the reviewer could impose their preconceptions based on a single study in another area, but I had to admit that I had no data to back my claim. Therefore, I decided that I would collect lizards at Alter do Chão every two months from February 1984 to May 1985.

In that year, I collected 35 giant ameivas, 39 striped whiptails and 301 rainbow lizards. It seems a lot of lizards, but from my plot surveys I knew that the number I had collected was not even one percent of the lizards on the peninsula. An ethics committee would probably not allow such intensive collecting anymore, and at the end of the year I was wondering whether responding to an anonymous reviewer was justification for taking so many lives. However, those lizards were used in studies of reproduction, growth, population dynamics, thermoregulation, diet, energy flux and taxonomy. Therefore, the number of results per lizard ended up being very high.

The first paper we published showed conclusively that all the teiids had strongly seasonal reproduction, and that most of the species were probably annuals, very few individuals living to two years old<sup>152</sup>. I hadn't expected that, though it coincided with what we had found for ground-dwelling frogs<sup>153</sup>. It seems that, in many places, it is generally better for small animals to invest in reproduction rather than in long life spans. This also made me feel better about the number of animals I had collected. The tiny dent I had made in the population would be completely recovered by the next year.

Although I realized that most lizards spent a lot of time moving between sunny and shady positions to regulate their temperature, I still thought of them as cold-blooded animals in comparison to mammals and birds. It was a holdover from popular books that seemed to relate body temperatures to mammalian superiority. In fact, mammals tend to have body temperatures several degrees lower than birds, which are just flying dinosaurs, and hence should be classified as reptiles. However, I hadn't thought that the lizards would be hotter than the majority of mammals.

The lizards could obviously be active at body temperatures lower than most mammals can tolerate. Many of the rainbow lizards and giant ameivas were moving around at body temperatures around 35 °C<sup>154</sup>. If a human's core body

temperature drops that low they are likely to enter into a coma and die. Our temperature generally only varies around half a degree above or below normal temperature, which is about 37 °C. In contrast, the rainbow lizards were active at temperatures from around 35 °C to slightly over 41 °C. They voluntarily reached those temperatures and only seemed to be actively avoiding temperatures much above 41 °C. Human temperatures above 40 °C indicate a medical emergency!



**Photo 12.5** A rainbow lizard, *Cnemidophorus lemniscatus*, warming up in the early-morning sun. The lizard will not forage until its body temperature is about 40 °C. Photo by Bill Magnusson.

The body temperatures of the ameivas were generally in the same range, but some had temperatures above 42 °C and the data did not indicate that they were actively avoiding higher temperatures. It may be that they would have accepted higher temperatures if they had been compatible with foraging. The striped whiptails did not have temperatures much above 40 °C, but they had an

interesting pattern not shown by the other species. Their temperatures varied seasonally, peaking in August, which did not correspond to the period with the highest air temperatures. It would be interesting to determine why they adjust their temperatures differently depending on the time of year, but we have never done so.

Scientists don't use the terms hot-blooded and cold-blooded. They talk about ectotherms, which are organisms that make use of external heat sources to regulate their temperatures, and endotherms, which generate heat within their bodies to maintain their temperatures. Just as well, because otherwise I would have had to refer to the lizards as hot-blooded, and hope that readers would know that this means that mammals like us are relatively cold blooded.



Field work and even doing the analyses was stimulating, but it all leads up to publication in a scientific journal, which is a very social business and not at all as objective as we would like to think. Peer review is like democracy; it seems too messy and subject to human frailties to work, but nobody has come up with a better system.

When I finished my Ph.D., I submitted three papers to a major herpetological journal, but all three were rejected by one of the referees, and therefore by the editor. I was especially peeved by rejection of one paper that had two parts. One reviewer said that the first part was first rate, but the second part wasn't worth publishing. The other reviewer said that the first part was worthless, but that the second part should be published. The editor wrote that the two reviewers were in complete accordance about rejecting the paper!



**Joint Annual Meeting of the Herpetologists League and Society for the Study of Amphibians and Reptiles**

**Photo 12.6** *The first international scientific meeting I attended in 1980. That's me circled in the center. Among other things, I was the only person who didn't have their shirt buttoned to the collar. Photographer unknown.*

I published the papers in other journals and was very interested to see that the editor who had rejected my papers was giving a talk on the same subject at the first scientific meeting I attended in the USA. I had expected new insights from the editor, who was a World authority on the subject, but he basically just summarized my papers. When I introduced myself to him after the talk, he said "Oh! I didn't know you would be in the US, otherwise I would have invited you to give the talk." I just smiled and didn't ask him why he had rejected my papers if he thought they were so good!

I had great trouble publishing our work on foraging mode. After the paper had been rejected by three journals I just stuck it in a drawer and probably would have forgotten about it. However, I got a letter from Harvey Pough, one of the foremost experts on animal foraging and physiology, saying that he had reviewed

the paper, but hadn't seen it in print and wanted to use it in his university lectures. I wrote back saying that the paper had been rejected by the other reviewer and by several other journals, and I had given up trying to get it published.

Harvey wrote back to me saying that I should publish it and giving me the following advice:

"The manuscript about foraging mode is fascinating. I can't see why it's being rejected, it looks solid to me. Possibly it questions the party line. If it's made the round of four journals, it's probably been seen by all the big names in lizard ecology in the U.S. and more submissions are unlikely to wear down resistance. In the face of similar problems with heretical views of aerobic and anaerobic metabolism, I found that by going to a European journal I was able to get a different set of reviewers."

However, the problem didn't seem to be with the big names. Laurie Vitt wrote saying the following:

"I just received your letter and must admit, I am somewhat taken by the fact that your manuscript has been rejected again. I simply can't understand what's going on with the editors, particularly since both Huey and Pough seem to like it."

The main reason I couldn't get the paper past the editor, possibly combined with my lousy writing style, was that the "big names" approved the paper, but a second or third reviewer, often misinterpreting what the big names had published, rejected it. With the limitations of space in journals, editors tended to turn down anything that one of the reviewers rejected. Nevertheless, buoyed by Harvey's and Laurie's support, I eventually submitted the paper to another journal. Rather than risk a weak revision, I sent a list of potential reviewers to the editor that only included the best in the field. It was accepted and has since become one of my most cited papers<sup>[155](#)</sup>.



**Photo 12.7** Laurie Vitt (far left) and fellow rockers in the 1960s. It's good to know that herpetological science is in such trustworthy hands. Photographer unknown.

The incident kindled a long exchange of letters with Harvey over the following years, and we even coauthored a chapter on foraging mode in a book<sup>156</sup>. However, more importantly, I had discovered the importance of persistence in publishing and not being put off by a few bad reviews. I would later discover that many of the most famous books on my shelves had initially been rejected by many publishers. Of course, it is much easier to keep submitting articles today. There was no readily accessible internet in the 1980's, manuscripts were posted to editors, who posted them to reviewers, and then the process started again until the manuscript returned to my desk, which often took eight months or more.

I also sometimes found it hard to be sure that my subjective interpretations of lizard behavior had anything to do with what was going on in the animals'

minds, which must be very different from ours. Many researchers were interested in how lizards perceived the World, but there was often no objective way of determining whether a lizard was interested in a stimulus or not because they don't talk or smile. Therefore, it became popular to record a lizard's interest in an object by the number of tongue flicks it gave. As lizards use taste the way mammals use smell, it was a bit like quantifying a dog's interest in something by counting how often it sniffed.

The number of papers on lizard tongue flicks soared and I got a bit sick of reading tongue-flick papers. After reading one on the responses of snakes to mammal scent, feeling mischievous, I decided to write an obviously bogus paper to a herpetological journal because I thought the editor would get a kick out of it. I wrote that instead of investigating lizard behavior by tongue flicks, I had investigated the responses of mammals to snakes by using tongue flicks. The original idea came from a British comedy movie.

The “paper” entitled “Can tongue flicks be used to measure non-snake prey sensitivity” went like this. I had secured specimens of the largest primate in the area that I had not yet been able to identify. For non-biologist readers, I should point out that the largest species of primate almost everywhere in the World, except for a few tiny areas in Africa with gorillas, is *Homo sapiens*, better known as humans. I had put a cardboard collar around the primates’ necks so they couldn’t see their lower bodies and then passed boa constrictors over their thighs. The most obvious result I had obtained was that there was an apparent sex difference in response. The males opened their mouths in a wide gape and stuck out their tongues rigidly as though unpleasantly surprised. In contrast, the females licked their lips with a circular motion as though in anticipation of something pleasant. I sprinkled plenty of probability values and other scientific jargon throughout the text. It is in the notes section if you are interested<sup>157</sup>.



**Photo 12.8** A Boa constrictor, the species I used in the farcical experiment on the effect of snakes on human tongue flicks. Snakes use their tongues to detect smells the way we use our nose. Photo by Bill Magnusson.

Of course, I had thought that the editor might not find the parody funny, but I was caught off guard by his reaction. He wrote “I am afraid that your manuscript cannot be accepted for publication in this journal because it consists of laboratory work. It is against the policy of this journal to publish such original research, as stated on the inside back cover of each issue. Although your project was very basic and uncomplicated, it does represent “an experiment”, therefore making it unsuitable for this journal. I suggest you expand the manuscript a bit and submit it to the Journal of Herpetology.” I don’t know if he was serious or was just continuing my joke, but I never had the courage to ask!

