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Highlands and Islands



Herpetologist Fred da Rocha with Helena Bergallo at Charlottes Pass in 2010. The cold of the Australian highlands restricts the activity of lizards and snakes. Photo by Bill Magnusson.

When we didn't go to the south coast for holidays, we went to the southern highlands. There are no high mountains in Australia, but the southern highlands near Canberra are high enough to be bitterly cold in winter. There, dad fished for trout with great success. However, trout fishing requires skill and patience, neither of which I had enough of, and I spent much of my time searching for reptiles.

Around the streams, I found southern water skinks⁵³. These agile skinks, the largest of which were the thickness of my thumb, live on rocks near water in the highlands. They were very similar to the water skinks that live around lower-elevation streams along the east coast. The lizards basked in sunny spots for a few minutes, then jumped from rock to rock searching for insects until they got too cold and had to bask in the sun again. Watching the little ones, I was reminded of my disastrous experiment with the baby water skink in Sydney.

I climbed the low hills, leaving the sparse forest and moving into pasture mowed low by cattle. Round granite outcrops were scattered across the field and the winter cold had fractured many of the rocks, resulting in deep crevices. I saw a large black lizard clinging to a nearly vertical rock face. It was about the thickness of my wrist, and had a short tail covered in spikes. When I got close, it scurried into a crack.

The crevice was not deep and I could touch the lizard's hard spiky scales with my hand, but it inflated its body with air and I couldn't dislodge it. The next one I found was in a slightly better position, and I was able to slide a stiff stick behind it and nudge it out. The size of a large carrot, it was hard and very strong, with spiky scales on its tail that made it feel like a pine cone. I released it back into its crack and investigated other rock outcrops. Each had two large lizards and several smaller individuals. These were Cunningham's skinks, and I would learn later that they live in family groups⁵⁴. Each adult pair controls a rock outcrop and the babies live with their parents until they are large enough to look

for their own crevices. Unlike most of the lizards I was familiar with, Cunningham's skinks eat a lot of plants, which probably explains why they did so well in the pasture.



Photo 3.1 *Cunningham's skinks, Egernia cunninghami, live in family groups in rock crevices. Photo by Bill Magnusson.*

My preconceptions about lizards were starting to crumble. Some were predators, some were insectivores, and some even ate flowers. There were species that hunted at night and species that foraged during the day. Some lived on the surface and others underground. Rather than pets, I started to see them as parts of complex ecological-interaction systems.



Around the southern part of Sydney, the only really dangerous species of snake you are likely to come across is the eastern brown snake. However, they are fast, and flighty, so you are unlikely to get close to one. Tiger snakes⁵⁵ occur around La Perouse on the northern edge of Sydney Harbour, the site of George Cann's famous snake shows⁵⁶, but for some reason don't occur in the southern suburbs, even though they are found in the mountains to the west and many areas further south. To find high densities of copperheads, brown snakes and tiger snakes, Merv went to the sheep and cattle grazing country in the southern highlands, and I sometimes accompanied him.

The highlands are bitterly cold in winter and may be covered in snow. In summer, they are hot and dry. We generally went in early spring, and Merv also used the opportunity to collect mice, especially after he couldn't breed them because of his heart complaint. The farmers stored bales of hay in stacks or open sheds, which were perfect breeding grounds for feral mice. We could sometimes find a dozen under a single bale of hay.

The mice attracted brown snakes and it would have been easy to catch one, but I wasn't interested in keeping them. The biggest I found was about a meter and half long, and thicker than a pick handle. It was on grass that had been cropped low by cattle and it reared up in an S shape with a third of its body off the ground. I circled around it, keeping several body lengths away, and it turned to keep facing me. Its neck was flattened, its mouth slightly open, and its tongue kept flicking. Its eyes appeared to be watching mine, but I put that down to imagination because I knew that snakes were too stupid to respond to such subtle cues.



Photo 3.2 *An eastern brown snake opens its mouth slightly to show that it is not happy about being disturbed. Photo by Bill Magnusson and Anthony Stimson.*

My circling must have taken me out of its preferred path and it suddenly dropped to the ground and shot for a blackberry thicket. It moved fast and I lost sight of where it went because my eyes tried to follow its mid body, but I didn't realize that my focus was losing ground until its tail flipped out vision and the rest had gone. It was one of the snakes' vanishing tricks. It is hard to follow long objects because our eyes don't focus on any particular part of the body, so our vision ends up going more slowly than the snake. If it were the same size, but round like a football, we would not have that problem.

I didn't like getting close to the brown snakes because, if you cornered one, it could turn from flight to fight mode, giving multiple strikes before rushing off. The snake is so fast that it is essentially impossible to avoid being hit and you have to hope it will hit loose clothing or give a "dry bite" with its mouth closed

just as a warning. In captivity, they never seem to adjust to an enclosed space and spend a lot of time circling the walls and investigating any weakness that might allow them to escape. It is much better to watch one in the wild than see them distraught and frustrated in a cage.

There were big black snakes in the mountains, and I would often sit and watch one poking its nose into crevices, probably hoping to find a frog. I once sat on a log as one approached and it didn't realize that I was there until it had started to nose up the leg of my trousers. I guess my shoes and socks were so dirty it didn't think a human could be in them, but when its tongue flicked my bare leg it drew back into an S shape and flattened its body. It must have spent ten minutes tongue flicking until it realized that I wasn't a threat and continued on its way.

I never saw any interesting behavior by the other species. The copperheads just looked like overinflated bicycle tires with an undersized coppery head on the end. They always seemed to be just curled up in the sun. Perhaps they had caught a lot of frogs during the night and were only interested in digesting their meals or, perhaps, many were gravid females with too many babies in their bellies to be able to swallow food.

Tiger snakes are one of Australia's most venomous snakes and responsible for a large proportion of snake-bite deaths. It was easy to see why. In the early morning, they lay flattened in the sun, usually near the bank of a stream. Their yellow and dark brown bands made them obvious against the green grass, but they would probably be well camouflaged against a background of rocks and leaf litter in natural bushland. The problem was that they seemed to expect you to see them and avoid them, and often would not move even if you trod very close. Sometimes they would flatten their bodies and hiss, but you could easily miss even this if you were a farmer striding along intent on seeing what was happening with your livestock. It is no wonder that they are often stepped on.



Photo 3.3 Tiger snakes, *Notechis scutatus*, are common in the southern highlands of Australia and it is easy to tread on one when it is basking because they tend to ignore humans and expect you to step aside. Photo by David Kirshner.

I rarely kept common tiger snakes, but Merv asked if I was interested in going on a trip to Hopkins Island off the South Australian coast to catch black tiger snakes that at that time were considered to be a different species, *Notechis ater*, though today they are generally just considered a variety of the common tiger snake⁵⁷. Someone had given him the name of a fisherman who took people to the island. I was interested in seeing the island tiger snakes because they were legendary. Living on small islands that have been isolated from the mainland for thousands of years, they have had to adapt to a specialized diet. There are no frogs on the majority of the islands, which are covered in dry-adapted plants. The baby snakes have to get by on small lizards until they are large enough to eat mutton-bird chicks.

Mutton birds are shearwaters⁵⁸, which like most seabirds require isolated places to nest. During a short period of the year, the mutton birds raise their chicks in burrows on the islands. The chicks thrive on the rich diet of fish brought by their

parents, grow quickly and their flesh is rich in oil. Commercial and recreational harvesting of mutton birds, mainly for their oil, is still undertaken in Australia and New Zealand. The snakes, like the humans, have to take advantage of the seasonal excess of food to carry them over to the next mutton-bird nesting season.

Merv and a naturalist friend, Ken Griffiths⁵⁹, planned to drive to South Australia in two days, which would require continuous driving. We would spend two days on the Island, making the whole trip last about a week, the most time that Merv could get off from work. I was also interested because we would go through the arid country of inland NSW and Victoria and would probably find other snakes on the road.

We headed west to cross the Blue Mountains and then headed south along the western plains in the direction of South Australia. Merv drove the first leg across the mountains where the road had many treacherous curves, but once onto the plains we took turns to drive along the long straight roads. There were often cattle and sheep on the road, but it was the kangaroos that were the greatest concern.



Photo 3.4 A red kangaroo, *Macropus rufus*, is beautiful in the wild, but can make a mess if it hits a car going 100 km per hour. Photo by Bill Magnusson.

Running into a cow at high speed would be very dangerous, but the cows generally just stood still and you could swerve around them. The kangaroos were beautiful as they ran parallel to the road, appearing as red or grey arrows streaking past the blue-grey vegetation. However, especially where there was a fence along one side of the road, they changed direction unpredictably and often shot directly in front of the car. It was a maneuver that probably saved their lives when being chased by dingoes, but was a bad choice when the potential predator was a car travelling at 100 km per hour.

I kept to about 80 km an hour at night, because it was impossible to avoid the kangaroos at higher speeds, and tiredness increased our reaction times. On one occasion we changed drivers after one of us fell asleep and drove off the road. I had been dozing in the front passenger seat when I was awakened by a loud bang and the car shuddered, as though it had been struck by a bullet from a high caliber rifle. Ken pulled over to the side of the road and steam was spurting out from under the crumpled hood.

It was two in the morning, and Merv and I stumbled around to the front of the car rubbing sleep from our eyes. The kangaroo's almost dismembered head was lying on the hood and it had lost the lower parts of its hind legs. The rest was jammed into where the radiator had been. We pulled it out and inspected the damage. The fan had been pushed back into the radiator, which was a tangled mess. The only way to get the car going again was to replace the radiator, and the nearest town that might have spare parts was over 100 km away.

Someone would have to catch a ride to town, buy a new radiator and then catch a ride back. It was 6 a.m. before a truck passed and Merv could get a lift to Wilcannia with the remains of the radiator. Ken and I remained with the car, and in the early morning it was interesting looking for lizards among the low bushes that gave the only cover in that arid landscape. However, that pastime lost its appeal as the sun rose higher. We had gotten little sleep on the hard red

earth the night before and probably would have dozed if we could have found somewhere comfortable, but the only shade was from the car. Its interior was soon too hot for comfort and we crouched against the wheels, trying to keep as much of our bodies as possible out of the burning sun. We had several gallons of water, but we were economizing it because we didn't know whether Merv would be able to get back that day and, in any case, we needed it to fill the new radiator.

Ken eventually got a lift into Wilcannia to find Merv, but passed him on the road and had to find another lift back. Sweat was pouring off me, the flies jostled to get into my eyes, and I was scrunched up against the side of the car to get out of the sun, when a truck pulled up at two in the afternoon and Merv climbed down with a new radiator. We had lost 12 hours and might not make our rendezvous with the fisherman, but now we drove even slower and we tired much more quickly from the strain of keeping watch for kangaroos.



Photo 3.5 The islands off South Australia are very scenic, but can be demanding places for humans or snakes to live. Most have no freshwater and much of the nutrients come from seabird colonies. Photo by Bill Magnusson.

We had planned to sleep overnight before meeting the fisherman, but we got to the coast at 5 a.m., and barely had time for breakfast. Fortunately, the fisherman was still willing to take us to the island. His boat was seven meters long, with a high prow and partially covered cabin to be able to plow through choppy seas. It was powered by a 100 hp outboard motor. He expertly backed his car down the loading ramp, placing the boat in waist deep water. The boat seemed big and overpowered to me because I was used to boating in my father's tiny plywood dinghy. The gentle ripples in the embayment hardly rocked the boat.

Once out of the bay, I changed my mind about the boat being oversized. The waves towered over us and the boat bucked as the powerful engine jumped us from one to the other. Hopkins Island is about 30 km south of Port Lincoln, but only a few kilometers from the uninhabited mainland and I hadn't realized how small it was. The fisherman took us to the leeward side of the island, where we could jump into shallow water and wade to shore. Sea lions swam around us or lay sunning on the warm rocks. We climbed off with our small bags of provisions and the fisherman said "I'll be back to pick you up tomorrow afternoon, if the weather permits."

It was then that I realized how vulnerable we were, marooned on a desert island crawling with deadly snakes with provisions for only two days. If something went wrong, such as a snake bite, we had no way to contact the mainland, and bad weather could prevent us from getting off the island, even by helicopter, for a week or more. I decided that I was going to be very, very careful.

We pitched camp behind the strand line and started looking for snakes. There were no trees on the island, and it was small enough to walk across in a couple of hours. The ground between the waist-high bushes was mined with mutton-bird burrows. We scrambled over rocks, fossicked among bushes, and even tried to reach the ends of the burrows with forked sticks, but found no snakes that day.

It was colder at night, especially in the sea breeze, but it was warm enough for temperate reptiles to be out and about. I directed my flashlight under a bush and two big black eyes stared back at me. I crouched closer and saw that it was a thick tailed gecko. As long as my hand, it stood high on its spindly legs and seemed unafraid. Its tail was unbroken and the black and white bands stood out in the torchlight. I grabbed it and I could see its internal organs through the semitransparent belly skin. It seemed much too delicate to live on a desert island inhabited by one of the World's deadliest snakes, but a world of mutton-bird burrows and the myriad insects that feed on seabird guano are probably much of what a lizard could wish for.



Photo 3.6 Thick-tailed geckos look to be too fragile to live on desert islands crawling with tiger snakes. Photo by Ruchira Somaweera.

We slept well, probably because of the lack of sleep on the trip down, and the next day dawned sunny and calm. I sat on a rock overlooking the sea, munching

a biscuit and appreciating the scenery. The water was clear blue, but of a different tone to the sky, which sported scattered white clouds. Female sea lions frolicked in the water or sat in groups around the big bulls. I had no camera, but it was the sort of sunny day combined with spectacular coastal scenery that is a photographer's paradise. I had little time to spend appreciating the scenery, however, because we only had about nine hours before the fisherman was due to pick us up. We spread out and started across the island.

It wasn't easy walking in the low heathland riddled with mutton-bird burrows, and I was careful to watch where I stepped, remembering how easy it is to step on common tiger snakes. It was about 10 a.m. by the time we reached the highest point on the island and I was beginning to despair of finding a snake when I saw a black tube covered in large scales. I carefully edged around until I could see the snake's head, which was a little wider than my thumb. I was carrying a stick to pin snakes, but I could not reach the head without touching bushes that were in contact with part of its body. I was in a quandary. If I went too slowly, it might disappear down a mutton-bird burrow before I got within pinning distance. If I went too fast, I might not pin it properly and would risk a bite. I decided to take it slow.

I carefully placed my feet between the bushes, balancing first on one, then on the other. The snake didn't move and I knelt within a few feet of it and carefully pinned it behind the head with the stick I held in my left hand. I expected it to writhe and try to escape, but it just lay there and I grabbed its neck with my right hand. It then tried to pull its head out of my grip, but it was weak and I had no trouble dropping it into a bag.

Further up the hill, I found a larger snake, well over a meter long, sunning in a patch between the bushes. Just like the first one, it ignored me until I had it pinned, then tried only weakly to pull through my fingers. It did open its mouth and I could see its fang sheaths, but only momentarily. I now had as many

snakes as I could keep and both Merv and Ken had also caught two each. I was very happy because I felt that I could take a bit of this mystical isle back to Sydney with me. I now know that animals lose their mystique when you take them out of the world that defines them, and I would now never dream of doing more than observing them where they live. However, I was only 18 years old and still had a lot to learn.



*Photo 3.7 Bill holding a Hopkins Island tiger snake. It is good that the snakes are weak and inoffensive. If not, he would not have lived to have written this book.
Photo by Ken Griffiths.*

The weather held and the fisherman picked us up as planned. The trip back was more spectacular than the trip out, mainly because we were flushed with success and the magic of the island. The incident with the kangaroo was all but forgotten and we kept an eye out for snakes on the road on the way back. At night, we caught a De Vis' banded snake⁶⁰, a beautiful little desert snake with

bands that made it stand out on the black bitumen. If my memory is correct, and it was that species, it would have been a range extension because the species was not officially known from the area until decades later. The only snake we saw during the day was a western brown snake⁶¹.

Thin and whip like, the western brown snake shot across the road in front of us. Merv slammed on the breaks and the car fishtailed to a stop about a meter from the snake, which was about an arm length long. We bundled out of the car and surrounded the snake, Merv and Ken on one side and I on the other. The only place it could escape to was under the car, and that is what it did. There was no cover on the bitumen road, but the snake shot up into the engine compartment.

Merv opened the hood, and we crowded around, worried that the snake would be burned by the hot exhaust. The snake was jammed under the air filter and there was no way to pin it, so Merv grabbed quickly for its head - not quickly enough. As his fingers closed around its neck the snake twisted and drove one of its fangs into his finger. Merv didn't let go, but just repositioned his fingers behind its head. As soon as the snake was in the bag, we focused our attention on Merv's finger. Western brown snakes are potentially deadly, and we were hours from the nearest hospital.

Merv held up his finger and stared at it, apparently waiting for the life-threatening symptoms, which fortunately never came. He had a little pain and tingling around the puncture, but it was apparently a "dry bite" and the snake had injected little venom. Although we were hours from a hospital, Merv was probably in no great danger, even if the snake had given a full load of venom, but it was a good reminder of how things can go wrong unexpectedly, and how foolish we had been to risk our lives on Hopkins Island with much deadlier snakes and no way of getting medical help.



Photo 3.8 *DeVis' banded snake, Denisonia devisi, a small inoffensive snake from the arid regions of southeastern Australia. Photo by David Kirshner.*

The black tiger snakes did not do well in captivity. They basically refused to eat and became very thin. Within six months, Merv's specimens had died. I had put my pair in my biggest vivarium, which was a meter and a half long and occupied most of one of the benches in my snake shed. I tried live and dead rats, but the snakes just ignored them.

I was distraught, and did not know what to do. If I had been able to, I would have released them, because I knew that captivity made snakes much more susceptible to disease than they would be in the wild, where they could use behavior to fight their maladies. I remembered one of Merv's tiger snakes that had developed a disease called canca by snake enthusiasts. It caused white pus-like exudations in the mouth and stopped the snake from eating. Antibiotics can be used to treat it, but these didn't work on this snake, and it became so thin that

its backbone stuck well out of its debilitated body and it developed sores that left a network of scars along its entire length. He probably should have killed it, but instead Merv released it into the wild on one of our trips to the mountains. When he recaptured it a year later, it still had the network of scars, but it was fat and had no signs of the disease.

Unfortunately, there was no way that I could get back to the island, but I remembered the incident with the broad-headed snake. Therefore, I trapped some native bush rats⁶² and put them with the black tiger snakes. The first rat had not gone two steps when the snake struck, and it was dead before it had taken another two hops. Both snakes soon regained weight on a diet of bush rats, but I didn't want to have to keep catching native rodents. Therefore, I killed a bush rat and tied a white rat onto its rump. The tiger snake swallowed the bush rat and did not stop its jaw crawl until the white rat went down its throat as well. After doing this three times with each snake, they learned that white rats are edible and they lived on them for years.

My mother looked after my snakes when I travelled, but she didn't open the top of the cage to give the black tigers water, she just poured it threw the wire mesh. I never worried about taking the top off the cage because the black tigers were the calmest snakes I had ever seen. One day, I had lifted the top off the cage and had it propped against the top of my head while I was concentrating on cleaning the water bowl, which had become fouled with snake poo. I was so concentrated on the task that I forgot the snakes until I felt one crawling along my shoulder. It had climbed onto the lip of the cage and then up onto my shoulder. I felt it sliding across my neck and then it turned back in the direction of the cage. I now had one of the World's deadliest snakes draped over my shoulders and it turned its head towards my face, its tongue flicking my cheeks and nose. I looked into its black eyes, felt its relaxed body across my neck, and sensed nothing in its behavior except calmness and curiosity.



Photo 3.9 Tiger snakes (*Notechis scutatus*) have toxic venom, but are very calm in captivity. The southern varieties are shiny black rather than banded.

Photo by Bill Magnusson.

I very carefully slid one hand under its body, lifted the cage top with the other, and gently lowered the snake back into the cage. It licked my hand, but showed no signs of distress. I had become part of its world, an object of curiosity, but not of fear or fight. Those snakes taught me a lot, but not in any technical sense. I had simply started to feel for them. I had seen that they live in a complex natural world with good things and dangers that we cannot imagine, and they sense that world in ways that are also beyond our conceptions. I had the privilege of seeing that because I tried unsuccessfully to mimic all that they had in the wild, at great cost to them. When we put snakes in steel and glass boxes we limit our ability to see how complex and beautiful they really are; I wonder how much that applies to humans as well!