

2

Sydney Reptiles



An eastern water dragon surveys its territory. The species is common around Sydney. Photo by David Kirshner.

Once I had reasonable living conditions for the animals, I could diversify my collection. The problem with keeping snakes was that they were carnivores, and many refused to eat dead prey. I therefore had to hunt for them. We collected lizards from under sandstone slabs, always being careful to put the rock back with a minimum of disturbance. Sydney was built on an area of exposed sandstone, with little or no soil in many places. Heating by the sun and erosion by wind and water cause slabs to split off from the parent rock, which make excellent cover for reptiles. However, many reptile collectors just turned the slabs, leaving whatever was sheltering underneath exposed to the hot sun, and often they let the rock drop, shattering it.

The upper surface of the rocks was dark grey with patches of bluish lichen, but we would often find an outcrop with yellow-white scars where the slabs had been. In the 1960s, it became fashionable to use bush rock in home gardens and landscape gardeners stripped the surface rocks from large areas. Sydney is surrounded by many national parks, and what saved the areas were the rocks and infertile soils, which made them unsuitable for agriculture. In the 1950s, it would have been difficult to predict that competition with humans for rocks would one day pose a grave threat to the reptiles of the region.

Although I mainly kept snakes, having to catch food for them made me familiar with most of the lizards in the district. The most obvious lizards were the copper-tailed skinks. These fast-moving lizards that I had called speedo lizards as a child were a bit thinner than my little finger, and their black and white stripes combined with an orange tail made them stand out as they foraged in the leaf litter. They were in almost constant movement, and it was difficult to catch one once it had warmed up in the early morning sun. We usually caught them by turning rocks while they were still cold and lethargic. Catching them in winter was relatively easy, but the snakes weren't eating then.



Photo 2.1 Coppertail skinks around Sydney forage on sandstone outcrops and retreat under flat slabs of stone when it is too cold for activity.

Photo by Bill Magnusson.

By this time, I knew more about physiology and understood why there were so many lizards among the sandstone boulders and so few mammals. Because the lizards used solar energy to heat up, and didn't have to burn food to stay warm, they could get by in areas with extremely poor soils where plant productivity was very low. The copper-tailed skinks would crawl out from their rock shelters to catch the sun's first rays. When they reached temperatures similar to those at which mammals operate, they would start foraging by poking their noses into crevices, under leaves, or into loose soil in search of insects and other invertebrates. They used their tongues and Jacobson's organs in the roof of their mouth to detect chemical signals much the way we use our sense of smell.

If the lizards spent too long foraging in the shade, their temperature would drop and they would have to sit in a patch of sun to warm up again. With their bright colors and constant movement, they were easy to see, but even

fast-moving predators, such as birds, found it difficult to catch them. One of the common predators in the area, the yellow-faced whip snake³⁸, seemed to specialize on them. These thin grey snakes, not much thicker than their prey, were well camouflaged on the leaf litter, and their huge eyes surrounded by a yellow comma were always on the lookout for lizards. Whip snakes have a lightning-fast strike, but they have to be very close to catch a copper-tailed skink.

It was impossible to outrun an active copper-tailed skink, and we used a strategy similar to that of the snakes to catch them. Seeing a lizard foraging along a rock outcrop, we would circle around, squat with one hand held close to the ground, and wait for the lizard to come into striking distance. We were rarely successful, the lizard passing too far away or the strike being too slow. I was only catching food for my snakes, but a pattern was emerging that I will return to later in this book. A fast-moving forager had bright colors and was mainly susceptible to predators that sat and waited for it to pass.



Some of the lizards of the rock outcrops were not very active foragers. White's skinks³⁹ lived in the rock crevices and only moved away from their refuges to sun or catch insects that landed on the rocks. These lizards were much bigger than the copper-tailed skinks; about the thickness of my thumb, and much more heavily built. Their colors were subdued - broad stripes of indistinct grey and brown on the back and white spots circled by black on the sides. They were much rarer than the copper-tailed skinks, and I did not feed them to my snakes. I also found a colony of coastal Cunningham's skinks⁴⁰ living in cracks in a rock outcrop. The adults were as thick as my wrist, and beautiful with dark grey, almost black backs and orange bellies. The family of skinks I found was in a National Park and I did not collect any.



Photo 2.2 Velvet geckos, *Amalasia leseurii*, live in cracks in rocks or under flat stones. Although they are probably the most common geckos around Sydney, they only come out at night and are rarely seen. Photo by Bill Magnusson.

Under the rock slabs, we found velvet geckos⁴¹, lizards that were thicker than the copper-tailed skinks, but much shorter, with broad heads, huge eyes and soft velvety skin. They presumably came out to forage at night, but I never saw any that were active. All of the snakes that ate copper-tailed skinks also ate Leseur's geckos. We also found fat little wood geckos⁴², but they were much less common than the velvet geckos and we rarely used them as snake food. All the geckos had broad tongues that they used to clean the scales over their eyes, which do not have moveable lids as in most other lizards.

There were southern leaf-tail geckos⁴³ in cracks in the larger boulders near streams. These geckos were prickly and had flattened tails that gave the impression of a dried leaf. Much bigger than the velvet geckos, some were longer than my hand and twice the width of my thumb. They were so spectacular that I never thought of feeding them to snakes.

Another big gecko also lived under the stone slabs. Thick-tailed geckos⁴⁴ were as large as the leaf tails, but their bodies were more rounded, and they were imposing when they stood up on their spindly legs. Their body colors were pinkish brown with yellow markings, and their unbroken tails had broad bands of black and white. If they lost their tail to a predator, they grew a new one, but it was drab grey. Their spectacular colors were probably cryptic at night, except for the tail. Geckos lose their tails easily, and it is probably one of their principal strategies to avoid being eaten - better to lose your tail than your life!

I did not think much about the diversity of night-active geckos around Sydney until I moved to the Amazon where, in most places, there is only one gecko that comes out at night, but several that forage during the day. Because they were active at night and I couldn't watch them, I didn't give the geckos much time when I lived in Sydney. Today, I would be able to study them with starlight magnifiers or infrared lights and I would love to have time to go back and find out what they are doing.



Photo 2.3 *Thick-tailed geckos wave their distinctive tails if threatened by a predator. Losing the tail is costly, but much better than the alternative.*
Photo by Ruchira Somaweera.

One line of Australian geckos produced species that are active during the day, but they are so different from other geckos, in fact from most other lizards, that they are generally put in a family of their own, the Pygopodidae. They are the Australian legless lizards. In fact, most are not legless, but have tiny flat hind legs with no toes that are kept pressed against the body, and they are sometimes called flap-footed lizards. Unlike snakes, whose tails are usually short, pygopodid tails are much longer than the head and body. Most eat invertebrates and have typical lizard-like heads attached to elongate snake-like bodies and tails, but one species, Burton's legless lizard⁴⁵, has a long snout with flexible jaws, and it eats other lizards.

The Burton's legless lizards that had lived behind my school were long gone, but I caught several in other areas and I was surprised at the variation in colors. Some were uniform grey, some had black lines on the grey, and others were brick red. The first one I kept was in a large cage with plenty of space to move around, but it spent most of the time curled up in the leaf litter with only its head exposed. I dropped a copper-tailed skink into the cage and the legless lizard raised its head slightly, but made no other movements. It was about the thickness of my index finger at mid body, but its head and tail were only about as wide as the copper-tailed skink that was exploring the cage. Although it hunted during the day, the legless lizard had large eyes with vertical pupils similar to those of nocturnal geckos, so I presume that it also hunted at night. Its snout was long and tapering, so that its jaws were many times longer than the width of its head. It was more like the beak of a bird than that of a lizard or snake.

The copper-tailed skink came towards the legless lizard and was in a position that would have been perfect for a forward snake strike, but the legless lizard waited until its prey started to pass to one side and grabbed it with a sideways sweep of the head that was almost too fast to see. The long jaws wrapped around the lizard at mid body and squeezed down, squashing so hard that it

looked as though the skink might be broken in half. The powerful bite seemed to be as effective as snake venom and the skink only gave a few halfhearted contortions before lying still. The legless lizard lifted its fore body off the ground, using its weight to keep its head pressed down on the lizard and the ground. Unlike snakes, which crawl their jaws along their prey, the lizard opened and closed its mouth as though nibbling the lizard along its length. It released its hold only for milliseconds and each successive bite squashed the lizard more and moved the bite closer to its victim's head.

By the time the legless lizard reached its neck, the copper-tail was obviously dead. The predator turned its victim around and swallowed it by dragging it down with alternate movements of the sides of its jaws, much as a snake would. Most geckos have short bodies, well developed legs, and eat small insects. Therefore, it is surprising that the Gecko lineage could have produced flap-footed lizards, which are convergent on snakes, right down to the elongate body and jaws that can be disarticulated to swallow prey as wide as the predator.



Photo 2.4 A Burton's legless lizard eating a grass skink. Photo by Ruchira Somaweera.

The only member of the other radiation of pygopodids found near Sydney was the scalyfoot⁴⁶. The heads of scalyfoots look like those of typical lizards, though perhaps slightly deeper than most. People told me that they loved banana, and that was the best food for them. I kept a scalyfoot in a cage in my room, and it really did like banana. I left small pieces on a log and it crawled over and ate them quickly. Soon, it was taking chunks of banana directly from my finger. However, despite eating regularly, it became thinner and thinner and something was obviously wrong. I put grasshoppers in with the banana, but it just ignored them. It seemed that I would have to release it, but I tried one more experiment.

I fasted the lizard for a week, not giving it banana, and when I threw in a grasshopper it grabbed the insect immediately and broke it into pieces to swallow. It made quite a mess eating the grasshopper, but used its broad tongue to lick the grasshopper juice off its eyes. From then on, I gave it only grasshoppers and it regained weight and remained healthy until I finally released it. I never imagined that, just like humans, lizards might develop bad food habits when artificial foods are available, even to the point of death. Many years later, I read that the principal food of scalyfoots in the wild is burrowing spiders⁴⁷. Even a diet of grasshoppers probably had not been very natural.



I was lifting a rock looking for geckos when I saw one of the most beautiful snakes found near Sydney. It was glossy black with tiny yellow dots forming rings around its body and blotches on its head. It wasn't much thicker than my index finger. The rock was big and I was off balance, so the snake could easily have escaped if it had made a run for it. However, it just curled up and assumed a striking stance typical of many highly venomous snakes. It was a broad-headed snake⁴⁸, a species with potent venom. They are now considered

rare because of destruction of their rocky habitat⁴⁹. In fact, they mainly use the rocks in winter time, probably for protection and warmth, and spend most of the summer months in trees hunting small mammals and birds⁵⁰.



Photo 2.5 Broad-headed snakes, Hoplocephalus bungaroides, live in trees during the summer months, but hide under rocks during winter. The species is endangered by rock collectors. Photo by Ruchira Somaweera.

I carefully pinned the snake with a stick, grabbed it behind the head and threw it into the cotton pillow case I was carrying. It would have pride of place in my collection, and several other collectors offered to buy it or trade it for other species. However, I didn't have commercial intentions or want to have a large collection. I kept the snake because it was incredibly beautiful.

The Broadhead ate velvet geckos, but it was hard work catching enough for it and I tried to feed it white mice that I got from Merv. However, the snake just ignored the mice and I concluded that the story that the species ate mammals

was a myth. I generally didn't leave mice in the snake cages because they would gnaw holes in the wire and sometimes attacked the snakes, gnawing at wounds until the snake died. Why the snakes didn't use their potent venom to kill mice that were annoying them I can't imagine, but they usually avoided biting other animals unless they wanted to eat them.

I had left a white mouse overnight in the broad-head's cage in the hope that the snake might eat it. However, in the morning, the mouse was outside the cage and the snake was nowhere to be seen. I hadn't closed the cage properly. I searched the room carefully, but after about an hour I concluded that it must have escaped the shed. We kept rabbits in a pen nearby, and they had shallow burrows and pieces of board to hide under. I lifted a board and dug into a burrow. There, curled up at the end, was the broad-headed snake, with a bulge in its stomach that could only have been made by a mouse. Although it ignored the white mice, it had eaten one of the feral mice that entered the pen to feed on the rabbit food. From that time on, I fed it wild-caught mice, and it did very well.

There were obviously subtleties to the chemical world of the snakes, and what we considered a mouse was not recognized as such by the snake. Many species, especially those that are active a night, can "see" with smell, not just the way the world is now, but who passed hours or days before. Snakes and many other animals⁵¹ probably make smell maps in their heads that tell them as much or more than the visual maps we are familiar with. We have become so dependent on our eyes that we cannot imagine how the World appears to animals with a keen sense of smell, or in the case of snakes and lizards, of taste.



There are also worlds within worlds. We concentrate on flowering plants and vertebrates, but most of the organisms in the world are too tiny for us to see. It has been estimated that there are more bacteria in a single human body than there are humans on Earth. Many of these microorganisms are essential for our survival, but we generally only note the microscopic creatures when something goes wrong. Merv started to have heart problems and the doctors told him he had contracted a disease from the mice he bred for the snakes. He had to feed his animals on other things afterward, and only bought rats and mice from others when he had to.



Photo 2.6 Death adders, *Acanthophis antarcticus*, are almost impossible to see when curled up under leaf litter. They twitch the tips of their tails to attract their prey, primarily lizards, to within striking distance. Photo by David Kirshner.

Merv's death adders also suffered from parasites. The baby death adders his female produced loved coppertailed skinks and grew well. Merv gave me one of

the babies and I was enthralled the first time I saw it hunt. The snake lay with its tail in front of its nose and, when I dropped in a lizard, it waved the flat yellow tip of its tail in a good imitation of a meal worm. The lizard ran across to grab the grub and the death adder struck faster than the eye could see, swallowing the lizard down to the front legs before it knew what was happening.

Several of the baby death adders, including mine, died while still small. The snake would contort, as though trying to disgorge something, before finally dying on its back with mouth open. We dissected the snakes and found large linguatulid worms⁵². These worms are really degenerate arthropods without legs that have evolved for life as internal parasites. The snakes get the worms from the lizards they eat and the adult worms migrate into the snake's lungs, where they often block the airflow and kill the snake. I was starting to learn that many of the things that make the world go round are mostly invisible to our senses. I would later find that lizards are subject to a wide range of parasites, but we know very little about their effects on wild animals.



