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*D. S. Richards.*

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ON THE  
V E R T E B R A T A

OF THE

LOWER MURRAY AND DARLING ;

THEIR HABITS, ECONOMY, AND GEOGRAPHICAL DISTRIBUTION.

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SOME of the observations embodied in this paper date back as far as the year 1852, but the greater number are the results of a nine months' sojourn on the Lower Murray and Darling, where, encamped in the neighbourhood of Gol Gol, I was enabled, with the assistance of Messrs. Williams and their devoted natives, to thoroughly investigate the fauna of that part of Australia.

I cannot speak too highly of the valuable co-operation of these gentlemen, the same whom Mr. Landsborough met on his return journey at the Warrego pushing on towards the Gulf, and whom he designates "the best of Australian Bushmen."

The Placental Mammals of this district are of course few. They belong to the Bats, (*Nyctophilus*, *Scotophilus*, *Rhinolophus*.) the Rodents, (*Hydromys*, *Hapalotis*, *Mus*.) and the Carnivora, which are represented here, as in the rest of Australia, by the Dingo alone.

CHEIROPTERA.

The Bats of the Murray and Darling all belong to the family Vespertilionidæ, as the large so-called "Vampire Bat" or "Flying Fox" (*Pteropus*) is not found in those regions.

Owing to the superstitions of the natives, who look upon every Bat as a departed friend and relative, who according to their ideas with regard to the transmigration of souls, has seen better days among themselves, has thrown spear and boomerang, and feasted upon Kangaroo, Wallaby, and Emeu, the number of Bats collected during my journey was very limited indeed.

When at Gunbower Creek I caught the first of these creatures, and I was seriously informed by the natives, that it was "brother belonging to black-fellow, who will kill lubra if you kill him."

Farther down the river this superstition vanished more and more; still they never assisted in procuring specimens of this family.

The following are the species collected:—

1. NYCTOPHILUS GEOFFROYI.

Geoffroy's Nyctophilus—

observed at various places between Gunbower Creek and the Junction of the Darling.

2. SCOTOPHILUS PUMILUS.

The Little Bat—

of which a single specimen was caught near Milldura, 20 miles from the Darling.

3. SCOTOPHILUS MORIO.

Chocolate Bat—

specimens of which have been captured on the Lower Darling. I have been informed that a "tailed Bat" was also an inhabitant of that part of Australia, but I did not succeed in securing a specimen. I suppose that it is a new species of the genus *Molossus*, of which only a single representative is as yet described from this country, discovered some years ago by the late Dr. L. Becker, in the neighbourhood of Melbourne.

4. RHINOLOPHUS MEGAPHYLLUS.

The Large-leaved Horse-Shoe Bat—

frequently observed near Gunbower Creek.

CARNIVORA.

CANIS DINGO.

The Dingo, Warrigal of the natives, is the only Australian representative of the large Group of carnivorous animals inhabiting every other part of the globe: and as our "Native Dog" has already established a reputation for himself, I shall be as brief as possible. In spite of the many enemies of the Dingo he is as plentiful as ever on the Lower Murray and Darling; neither the strychnine of the settlers, nor the guns or spears of the Aborigi-

nals could exterminate the breed: which no doubt is also maintained by stray shepherds' dogs—not all the so-called Dingos being of the pure "Warrigal" blood.

There is a black and tan coloured variety. Various litters taken by myself had generally four pups, sometimes a pair of each colour. The natives, who hate the Dingo most cordially for his living on the fat of the land, kill him on every opportunity and eat his flesh, which is by no means of ill flavour, though I have partaken of it under stress of hunger, and I will not vouch that I should sit down to roast Dingo with the same gusto now as ten years ago in the Murray scrub.

A question has been raised as to the origin of the Dingo in Australia, and several high authorities are of opinion that the dog was introduced there by man; if so, this must have been at a very remote age, as the first molar tooth of a dog has been found with other fossil remains in the breccia of the Wellington caves.

In those days of *Diprotodons*, not only did the Dingo exist, but also some of the animals now restricted to the island of Tasmania, as *Thylacinus* and *Sarcophilus*, teeth of which I have discovered in the same breccia, and which are now on view at the Australian Museum.

### RODENTIA.

The third group of the Australian Mammalia consists of the Rodents, which are largely represented, and, to some extent, partake of the structure of the Kangaroo; many having their hind limbs much elongated, and moving by a succession of jumps, in which they use the hind legs only. A few (4 species) are aquatic (*Hydromys*), expert swimmers and divers, and a great many are arboreal, and apparently the representatives of the squirrels in Australia.

All the species observed by me on the Lower Murray, are strictly nocturnal, and all bring forth 4 young ones (born blind) at a time.

#### 1. HYDROMYS CHRYSOGASTER.

Golden-bellied Beaver Rat.

All the specimens of this rat procured by me are from Gunbower Creek and Lake Boga, where this animal is very plentiful.

It is strictly nocturnal, and was often observed after sundown, gambolling upon the shores of that beautiful lake. The Black Snake is a sore enemy to the young progeny of this *Hydromys*; for I captured a specimen, which, upon being opened, proved to have swallowed a full dozen young Beaver Rats, about the size of new-born kittens.

This Rat is not found on the Lower Darling, at least, I was assured by the natives that they had never seen it.

## 2. HAPALOTIS CONDITOR.

Building Hapalotis.

Koel or Kohl of the natives.

Captain Sturt described this animal first, though Sir Thomas Mitchell mentioned it before him.

It is one of the many species which will soon be extinct, as I found that it had already retreated before the herds of sheep and cattle across the Murray. Only a few empty nests were occasionally met with south of that river. The few specimens collected were captured by the natives about 10 miles north of the Darling Junction; though many empty nests, or rather huts, were met with, occupied by *Hapalotis apicalis*, which, it appears, often takes a fancy to the roomy structures of the building *Hapalotis*, and ejects the original inhabitant. I kept both species together in a box, but they never agreed, and, though the building *Hapalotis* is much larger in size, it could never hold its own against *Hapalotis apicalis*. They feed on various seeds, bulbous roots, insects, and the smaller species of *Hapalotis*, or birds' eggs, &c., and bring forth 4 young at a time.

## 3. HAPALOTIS APICALIS.

White-tipped Hapalotis.

Tillikin of the natives.

Mr. Gould figures this species, of which he mentions merely that he received it from South Australia. I observed the first specimens in the neighbourhood of Euston, and found it in great numbers upon Sir Thomas Mitchell's old track on both sides of the Murray. It also occurs on the Darling, and I have no doubt

that the late lamented Explorers called Rat Point (in the neighbourhood of fort Bourke) after this *Hapalotis*.

They are gregarious in their habits. I have dislodged as many as 15 specimens from a single tree, and kept large numbers in captivity. They became quite tame; and many which had escaped would return to join my frugal supper at night, and help themselves, to damper especially. This is a very graceful animal, strictly nocturnal in its habits, and its flesh white, tender, and well-tasted.

#### 4. HAPALOTIS MITCHELLII.

Mitchell's Hapalotis.

Kahlpere of the natives—

is another animal which the late Sir Thomas Mitchell first discovered. I have no doubt that it is widely distributed over the Australian continent, but I was not able to procure specimens at Gunbower Creek, or at the Junction of the Loddon. The first pair obtained were brought to me by natives in the neighbourhood of the Murrumbidgee. This animal is very plentiful on the Darling; and as many as 50 specimens were often procured by the native women in an afternoon. It burrows into the ground, and is dug out by them. *Hapalotis Mitchellii* is strictly nocturnal in its habits, and the female produces 4 young at a time. Though they are easily kept in captivity, they often kill each other, if not well supplied with food; they also have a disagreeable habit (to the naturalist, at least) of gnawing each others tails off.

#### 5. MUS SUBRUFUS?

Dusky mouse.

Pethack of the natives.

Apparently an undescribed species (for which I would propose the name of *Mus subrufus*) is found in large numbers between Gol Gol Creek and the Darling; it is nocturnal and gregarious, and, like *Hapalotis Mitchellii*, burrows into the ground; 4 young are produced at a time by the female.

All the Rodents are eaten by the natives, but only in case of no other food being at hand, as a large number of these little creatures are wanted to satisfy the hunger of a black-fellow.

This closes the list of the Placental Mammalia, which I had

an opportunity of observing. But there are, no doubt, still many species of Rodents new to science ; in fact, several skins of *Hapalotis* were received through native tribes living some 100 miles further north, but all were in such bad preservation, that it was found impossible to give a correct description of them.

### MARSUPIALIA.

By far the larger number of animals inhabiting the extensive plains on the Murray and Darling are marsupial ; and with a few exceptions truly *nocturnal* in their habits.

This accounts for the apparent scarcity of animal life ; and often do travellers mention, that except an occasional Kangaroo, they have never met with any mammalian animal in the interior of the country.

Two-thirds of the smaller mammalia collected and examined by me on the Murray were new to many old residents, and even the natives, who, in many parts, have acquired habits different from their former mode of life, had almost forgotten the existence of some of these species. With the aid of the Messrs. Williams and the natives, I succeeded in procuring every species known to exist in that part of Australia ; and in finding also a number of animals of this order which hitherto had been only known to frequent Western and South Australia.

The following are the different genera :—

Dasyuridæ	{	<i>Dasyurus.</i>
		<i>Phascogale.</i>
		<i>Antechinus.</i>
		<i>Podabrus.</i>
		<i>Myrmecobius.</i>
Peramelidæ	{	<i>Chæropus.</i>
		<i>Peragalea.</i>
		<i>Perameles.</i>
Phalangistidæ	{	<i>Phalangista.</i>
		<i>Belidæus.</i>
Macropodidæ	{	<i>Macropus.</i>
		<i>Onychogalea.</i>
		<i>Lagorchestes.</i>
		<i>Bettongia.</i>

I may also mention the Genus *Phascalomys* (the Wombat), as I know upon reliable authority that *P. latifrons* has been killed in the neighbourhood of the "North-west Bend" on the Murray.

The two genera *Petaurus* and *Phascolarctos*, the so called "Flying Squirrels" and "Native Bear," are not represented; both frequent the rocky and mountainous districts only.

#### 1. *DASYURUS GEOFFROYI*.

Native Cat or Tiger Cat of the Settlers.

"Kettrie" of the Natives.

This is the most blood-thirsty of the Marsupial animals inhabiting the Murray scrubs, solitary in its habits, strictly nocturnal, and the terror of the feathered tribe, particularly of the yellow crested Cockatoo. Afraid of nothing, it will, when hungry, attack any other animal; a mother will eat even her own progeny, if she has nothing else to fall back upon.

I have often detected the lair of this *Dasyurus* by the heap of feathers and bones generally collected at the foot of the tree upon which it dwells; it is eaten by the natives. The female is not furnished with the usual pouch, and in June or July brings forth often as many as 6 young at a time, so that every teat is occupied, 6 being the number of mammæ generally observed in this species. The Native Cat of our neighbourhood (*Dasyurus viverrinus*) is somewhat smaller in size, with a more bushy tail, and the female furnished with 6 teats; this may not be constantly the case, though I am informed by my friend, Mr. E. P. Ramsay, that various specimens examined by him had not more than 6 teats, only 4 of which were in milk. Owing to the absence of a pouch, many of the weak young drop off, and only a few, generally 3 or 4, reach maturity.

All my attempts to domesticate the young have proved fruitless; they never learnt to recognise the hand that fed them, and though I kept a pair nearly six months, at the end of that time they were found only more ferocious than ever; having made their escape at last, they kept near the huts and tents of the camp, completely clearing the place of mice and other vermin. Wherever a spot is infested with mice or rats in the bush (and some of the stations are overrun with them) there

is no better remedy than to procure a few young *Dasyuri*, which having been kept on the ground for a few months, and turned out into the store-house, will soon "effect a clearance."

The range of this species extends, according to Gould, as far as the West Coast.

The Natives inhabiting the country near the junction of the Darling, have some superstitions regarding this animal, and "Jacob," an old chief on the River, often assured me, that "Kettrie make rain and rainbow." As his kinsmen are not fond of rain, I suppose they kill as many Kettries as possible.

## 2. PHASCOGALE CALURA.

Handsome tailed Phascogale.

Kultarr, (native name.)

This is without doubt the most handsome species of the genus. It is ashy grey above, white underneath, with long bushy black tail, the upper half of the basal part of which is of a rich chesnut colour.

The few specimens which have found their way to Europe were procured at the Williams River, Western Australia; but when the intervening country between the Murray River and the West coast is better known to Naturalists, it will probably be found that the range of this beautiful creature extends over the larger half of the continent. The few specimens brought to me by the natives were generally found in hollow limbs of trees. I kept several alive for a considerable time, feeding them with live mice or small birds. Their movements were cat-like, but very graceful; like all the members of this genus they are strictly nocturnal in their habits. A female specimen, caught in the beginning of June, had 8 very small young ones attached to the teats, which were 10 in number: no regular pouch was observable, the long hair only covering the young progeny.

My specimens were captured near Williams' Station, Gol Gol Creek, about 10 miles from the Darling Junction.

## 3. PHASCOGALE PENICILLATA.

Brush-tailed Phascogale.

This species, nearly allied to *P. calura* is, no doubt, still more widely distributed. It is occasionally found in the neighbour-

hood of Sydney, and extends its range right across the continent to the west coast. On the Murray River, it is exceedingly rare; the only specimen I found was secured in the neighbourhood of Mount Hope. I have subsequently received specimens through the natives, when at Port Lincoln; and examined some which had been captured at Albany on King George's Sound, and have found them to be identical with the original Tapoa-Tafa of White.

The only female specimen I saw had no pouch, but 10 teats covered with long hair. I suspect that, as in the other species, a large number of young is brought forth; but how many reach maturity must yet be left to be determined.

#### 4. PHASCOGALE LANIGERA.

Woolly Phascogale.

Kultarr (native name.)

Two single specimens of this little *Phascogale* were obtained through the natives at Gol Gol Creek: one a female with 10 teats and 7 young. The hind legs in this species are long and slender, and the natives informed me, that it lived upon the ground, unlike the other species of this genus; most of which are arboreal.

The little creature, which I kept alive for several weeks, was fond of flesh, and, when put into a box with a number of Rodents, attacked the frightened mice immediately.

The natives informed me, that the animal was very rare; in fact, they had a dispute about its name, and called it "Kultarr," just as they did with *Phascogale calura*, while some asserted they had never seen the animal before.

Though I offered high rewards for another specimen, I did not succeed in procuring any more than these.

This species is also strictly nocturnal in its habits.

#### 5. ANTECHINUS FLAVIPES.

Rusty footed Antechinus,

Warum (native name.)

This lively little animal is the most abundant of the *Antechini*, and, though nocturnal, is often seen during the day time. Its

range extends from the east to the west coast. It used to be so common near the camp on the Murray, that I have often captured several specimens whenever a load of wood was brought in. I kept many alive and always found that, like the species of the *Phascogale*, it would attack and kill any number of mice, if put into the same box. The shallow pouch of the female is provided with 10 teats, and as many young are sometimes attached to them. I find several entries in my diary corroborating these facts:—

Aug. 17.	1	female	<i>Antechinus flavipes</i>	with	10	young.
„	19.	1	ditto	„	9	„
„	20.	1	ditto	„	9	„

Several females procured in September had only 6 young, of much larger size, attached to the teats.

This animal is common on the North Shore, Sydney.

#### 6. ANTECHINUS ALBIPES.

White-footed Antechinus,  
Tram-Trammit (native name.)

One of the smallest of this genus, and widely distributed over the whole of the southern part of the continent from Swan River to Port Jackson. The specimens I obtained on the Plains of the Murray are identical with specimens from this Colony, and with those inhabiting South and Western Australia.

The female is furnished with a rather shallow pouch containing 10 teats; and in specimens captured in July and August, from 6 to 9 young, of the size of a pea. The Natives caught this species frequently on the Sand-hills near our camp, in King George's Sound. *A. albipes* frequents rocky places, and is often found under stones. I have also found specimens under stones near Manly Beach.

It bears captivity very well. I have lately found several specimens, and succeeded in keeping them about six weeks alive; they thrive very well, and I killed them only on account of their rather strong odour, if fed on flesh. Though small, they are very ferocious, and they will attack mice of double their size, without fear.

7. *PODABRUS CRASSICAUDATUS*.

Thick-tailed Podabrus.

Mondellundellun (native name.)

All the specimens of this species ever sent to Europe came from the West coast of this continent; but as I have obtained specimens from various parts of the Murray River, I doubt not that it inhabits the intervening country between the Swan River colony and New South Wales. I have never seen this handsome little Podabrus from the eastern part of Australia, though a species with a much longer tail (*Podabrus macurus*) occurs in the neighbourhood of Brisbane, and further north. I have kept several specimens alive for months, but always found it necessary to separate them on account of their ferocity. I have more than once lost a number of valuable Rodents through inadvertently adding a *Podabrus*, or any species of *Antechinus* to them; they fall upon the poor mice immediately, and kill many more than they can possibly eat. If not supplied with food, they attack and devour each other.

Females, which the natives brought in July and August, had from 6 to 9 young ones in the rather shallow pouch. The number of teats is 10; and, as I found several with the whole number in milk, I believe that as many as 10 young are brought forth at a birth.

All the species of the genus *Antechinus* are rather sensitive to cold; and, when the thermometer fell as low as 30° a great many perished.

Beyond a hoarse screech, I never noticed any voice. A singular peculiarity in all the *Dasyuridæ* is, that they carry their ears folded down, never erect, when alive: and, though I do not want to find fault with Gould's beautiful work, I must say, that, in this respect, the representations he gives of this tribe of the animals of Australia are not over true to nature.

8. *MYRMECOBIUS FASCIATUS*.

Banded Myrmecobius.

This singular animal which also inhabits the Plains bordering on the Murray and Darling, is not found close to the first

named river: and, as far as my inquiries among the natives went, has never occupied that part of the country. It does not now inhabit any part of Victoria, and I think the Murray may be taken as its southern boundary. A quarrel existed between the Darling natives and the tribe which accompanied me, so that I was not able to procure any live specimens of this singular animal, but its existence is proved sufficiently. I have been informed by Mr. Scott, the owner of a Station at Tapio, about 80 miles from the Darling Junction, that the Banded *Myrmecobius* is by no means rare; and that the natives could procure specimens for me; but a few bad skins were all I obtained.

How many young ones the female produces, and with how many teats she is furnished, I am unable to say; the only fact proved is, that the range of *Myrmecobius fasciatus* is not limited to the West Coast, and, that according to the natives, it is not nocturnal in its habits.

#### 9. CHÆROPUS OCCIDENTALIS.

The Eastern Chæropus.

Landwang (native name.)

This singular animal which Sir Thomas Mitchell first discovered in his expedition to the Darling, June 16, 1836, is still found on the plains of the Murray; though it is exceedingly rare, and is disappearing as fast as the native population. The large flocks of sheep and herds of cattle occupying the country will soon disperse those individuals which are still to be found in the so-called settled districts, and it will become more and more difficult to procure specimens for our national collection.

During a period of six months, I encamped not far from the spot where Sir Thomas Mitchell secured his tail-less animal. I had the greatest difficulty in obtaining a few specimens, but succeeded at last, and as I believe that nobody has ever been able to observe the habits of this singular creature in a state of nature, I will quote from my diary, October 4th, 1857:—

“After returning from a short excursion into the scrub, I fell in with a party of natives who had succeeded, at last, in securing a pair of the *Chæropus*, (male and female.) They wanted all manner of things for them, from a pair of blankets to a cutty

pipe; and as I was very anxious to sketch them from life I emptied my pockets there and then; and promised a grand entertainment for the night with plenty of damper and sugar and tea."

On arrival at the camp, the two animals were secured in a bird cage; and I was busy for several hours sketching my charges in different positions.

Gould's figures of *Chæropus occidentalis* are spiritless, being taken from dry skins. I was in the habit of showing a copy of Sir Thomas Mitchell's tail-less specimen to the natives, urging them to procure animals of that description; of course, they did not recognize it as a "Landwang," and I was furnished in consequence with a large number of the common Bandicoot (*Perameles obesula*) minus the tail, which, to please me, had been screwed clean out.

About sun-down, when I was about to secure my animals for the night, one of the nimblest made its escape, jumping clean through the wires of the cage.

At a quick pace it ran up one of the sandstone cliffs, followed by myself, all the black-fellows, men, women, and children, and their dogs.

Here was a splendid opportunity for observing the motions of the animal; and I availed myself of it. The *Chæropus* progressed like a broken down hack in a canter, apparently dragging the hind quarters after it; we kept in sight of the fugitive; and, after a splendid run up and down the sand hills, our pointer, who had been let loose, brought it to bay in a salt bush.

A large tin case was fitted up for the habitation of these animals, and provided with coarse barley grass, upon which, as the natives informed me, they feed. Insects, particularly Grasshoppers, were also put into the box, and, though they were rather restless at first, and made vain attempts to jump out, they appeared snug enough in the morning, having constructed a completely covered nest with the grass and some dried leaves.

During the day time, they always kept in their hiding places, and, when disturbed, quickly returned to them; but, as soon as the sun was down, they became lively, jumping about and scratching the bottom of the case, in their attempts to regain

liberty. I kept these animals upon lettuces, barley grass, bread, and some bulbous roots, for six weeks, until the camp was broken up, when they were killed for the sake of their skins.

I think that about 8 specimens of this species were secured during our stay; several of which, proved to be females with good sized young ones in the pouch, which is very deep and runs upwards, not like that of a Kangaroo. All were provided with 8 teats, and bore 2 young ones, only one pair of teats being drawn.

I may mention here that the *Chæropus* drinks a good deal of water, but will neither touch meat nor attack or eat mice, as the other members of this family do.

Their dung, which I often examined when out hunting, was entirely composed of grass, very dry, about the size of sheep's trundles, but much longer, so that I believe, that in a state of nature, they feed principally upon vegetables. They are very good eating, and I am sorry to confess that my appetite more than once over-ruled my love for science; but 24 hours upon "pig face" (*mesembryanthemum*) will damp the ardour of any naturalist.

The young which I took from the pouch of several females, never exceeded 2 in number, and were so far advanced, that I conclude that the breeding season is in May or June. It is a curious fact, that the third toe in the fore feet of the *Chæropus* is much more developed in the young than in the adult animal: in fact, the former looked more like a young *Perameles*, than a *Chæropus*; the limbs being short and strongly made—the basal half of the tail, which in the adult is covered with long black hair, is of a dark purple colour in the nude young animal. The eye of this species, which is very large and brilliant, is represented much too small in Gould's figures.

#### 10. PERAGALEA LAGOTIS.

Rabbit Rat.

Wuirrapur, (Murray natives.)

Jecko, (Darling tribes.)

This beautiful animal, like many other species, has long ago retreated to the north of the Murray. It is social, not gregarious,

in its habits, only found in pairs scattered over the wide plains formerly the sole domain of the Kangaroo and Emen. It digs into the ground, forming a burrow like a rabbit, but with only one entrance, and differs herein from *Bettongia Graii*, the burrows of which are provided with several outlets, and may easily be distinguished from those of the *Peragalea*.

As this "Rabbit Rat" often prefers entering the ground on a hill side, and as hills, even of very slight elevation, are often scarce on these extensive plains, it will sometimes happen, that the *Peragalea* takes advantage of the mound raised upon a departed black-fellows grave, providing for itself a habitation beneath the natives weary bones. Upon this ground an investigator asserted, some years ago, that this animal dug out the dead bodies of the natives and fed upon them. I think that every naturalist that has the slightest knowledge of the habits of this animal, will agree with me, that it is no resurrectionist, and if it takes advantage of the "mound," it is only for convenience sake, and not for criminal purposes.

It is nocturnal in its habits, feeds upon grass, roots, insects, &c., and always retires before dawn. Its flesh is very good eating, though the fur has a peculiar sweetish smell which is retained for years after the skin has been cured.

The natives seldom unearth the animal; the holes being very deep, and often found to be uninhabited. I procured a few specimens only, among which, was an adult female, with a very deep pouch, 8 teats, and two large young.

All the spots which, in the adult, are covered with black hair, were of a purple colour in the nude young specimens, which appeared to be about four months old; so that, according to my diary, their breeding season will be about the beginning of May. The pouch runs upwards.

#### 11. PERAMELES FASCIATA.

Banded Perameles.

Thill, (native name.)

Moncat (do. do.)

One of the many animals whose range extends from the east to the west coast of the Continent, it is common on all parts of

the Murray River, and is also found in Victoria, in South Australia, parts of Western Australia, and in the immediate neighbourhood of Sydney.

Though provided with strong claws it seldom burrows, except in search of its food, which consists of insects, bulbous roots, various herbs, &c. Nocturnal and social in its habits, the striped (so called) "Bandicoot" seeks shelter, during the day time, in hollow logs, or under stones, although sometimes it constructs a sort of nest like the *Chaeropus*.

This animal bears captivity well, and becomes very expert in catching mice. I had several about the camp; and they proved as useful as cats.

I was in the habit of feeding the specimens kept in a large tin case with various kinds of Rodents, which they killed with astonishing quickness.

The *Perameles* would tumble the mice about with its fore paws, break their hind legs, and eat generally the head only. I have seen a single individual kill as many as twenty mice in a very short time, breaking their bones successively, after which it would begin to satisfy its hunger.

During the months of May, June, July, and August, female specimens provided with 8 teats, and containing from 2 to 4 young were captured by the natives. Those obtained in August, had grown to the size of a young rat; fur, cream coloured, without the markings upon the haunches, which appear at a more mature age.

The flesh is palatable. The pouch runs upwards.

## 12. PERAMELES OBESULA.

Short-nosed *Perameles*.

Bandicoot of the settlers.

Pirrikin, Murray natives.

This animal is the most common of the *Peramelidae*, inhabiting the whole of the Southern part of the Continent and Tasmania. How far its range extends to the north, I have been unable to ascertain, though I know that it is frequently met with on the Clarence River.

The flesh is delicious, especially when *done* in the native style,

that is, the hair removed, and the game roasted upon the coals. From May to September, females with from 2 to 3 young ones in the pouch were frequently captured. In October or November, the young progeny begin to shift for themselves.

The pouch is very deep, the entrance upwards, and contains 8 teats.

### 13. PHALANGISTA VULPINA.

Vulpine or Brush-tailed "Opossum"—

So well known to everybody, that I shall not enlarge upon it; but merely remark that this species is the staff of life to the natives.

I often admired my native friends, when after a hard day's unsuccessful hunting they dropped in at the camp empty handed; how carefully they would examine the large flooded Gum-trees (*Eucalyptus rostratus*), fringing the river banks, how nimbly they would get a footing upon some hollow limb, and with what perseverance "Possum" was dislodged, and perhaps, accidentally dropped into the river, whence it had to be rescued by the black-fellow's better half: for it was the question of "to eat or not to eat."

How often the *Phalangista vulpina* produces young, I am not able to tell with certainty. I think, judging by the large numbers in every forest, several times a year. The female is provided with only 2 teats, and seldom carries more than one young one at the time.

### 14. PHALANGISTA VIVERRINA.

Ring-tailed Opossum.

Pirrath of the Murray natives.

A rare animal on the Murray and Darling. I secured no more than two specimens during my stay there. It is much lighter in colour than the species inhabiting the Swan River colony. The pouch in the female is provided with 2 teats.

It is one of the characteristics of the flat country traversed by the Murray and Darling, that no other species of the *Phalangistidæ* are found there.

The first *Belidæus* I captured on my return, at Mount Ida,

McIvor Range, 80 miles distant from the Murray, is, according to Gould, a new species, and is figured by him in part XI. of his Mammalia, 15, as "*Belidæus notatus*."

As I made many enquiries of the Natives about the genus *Petaurus*, and found that these animals are not known to them, I do not hesitate to consider their range to be restricted to the mountainous coast districts.

All the members of this family are nocturnal, and the female is provided with one pair of mammæ only. In the "Flying Squirrels" the number of young is sometimes 2; but the Koala or "Native Bear" never produces more than a single young one at a time.

I now proceed to the Kangaroo, whose form and habits seem to have struck the discoverers of Australia with special wonder. Large Plains are admirably adapted to the habits of these animals, and the low lands of the Murray have once swarmed with their numbers as they do now with cattle and sheep. At the present time, large flocks of Kangaroos are a rare sight; and though I have seen as many as sixty or eighty together, I think that this is the exception, not the rule.

The most formidable, and no doubt the handsomest species of the whole tribe is,

#### 15. OSPHRANTER RUFUS.

The Great Red Kangaroo.

Bullucur of the Murray natives.

Which has become very scarce upon the left bank of the Murray, but is still found in considerable numbers in New South Wales and South Australia. The range of this species to the eastward does not extend much beyond Mount Hope.

This large beautiful animal, about which a great deal has been written, ought to be well known to every colonist, and yet it is only a few months ago that the very existence of such a creature was doubted by an enlightened "critic," who was pleased to designate this species as ante-diluvian; indeed it must sound like a fable to people who know little or nothing about such matters, if they are informed that the male of this species is of a foxy red, and the female of a bluish grey colour.

The Red Kangaroos, like the great Kangaroo, (*Macropus major*) feed in flocks, and, when disturbed, the old males cover the retreat of the fleet females who are off first, so that specimens of the latter sex are rare, the dogs generally stopping the progress of the rear-guard of the red "old men."

In wet weather, when the chalky top soil of the "Malley scrub" is softened, these Kangaroos are easily captured: they sink deep into the ground, and any black-fellow's cur, trained for such work, will stick to the tail of the Kangaroo until his master is able to come up and crack its skull, or run a spear through it.

The female produces one young at a time, which she carries in her pouch until it is of considerable size. As in all the other members of this family, the number of mammæ is four.

The flesh is very palatable—I prefer it to that of *Macropus major*.

#### 16. MACROPUS MAJOR.

The Great Kangaroo.

Bullucur of the Murray natives.

A much more common species than the preceding, and similar in its habits, the female producing only one young one at a time. The pouch has 4 teats.

Dr. James C. Cox has lately presented two young of this species to the Museum, which were *both* taken from the same pouch. I mention this as being of very rare occurrence; they are about  $\frac{1}{2}$  inch long.

#### 17. ONYCHOGALEA FRÆNATA.

Bridled Nail-tailed Kangaroo.

Merrin of the Murray natives.

The most common of all the smaller species of the Kangaroo tribe; often seen out during the day-time, though, when observed in captivity, much livelier at night; gregarious, the female producing one young at a time, generally in the beginning of May; pouch containing 4 teats. Its flesh is white and well tasted.

## 18. LAGORCHESTES LEPOROIDES.

Hare Kangaroo.

Turatt of the Murray natives.

Common upon the level country between the Murray and Darling; strictly nocturnal and solitary in its habits; it is seen during the day-time only, and is generally found asleep under some salt bush, or in any other sheltered locality. The Hare Kangaroo is the fleetest of the whole tribe, and will, when hotly pressed, take leaps more than 8 feet high.

A single young one is produced at a time; pouch furnished with 4 teats. This species is easily tamed, and I have kept several at the camp, which lived well on biscuit, bread, or boiled rice.

Its flesh is delicious, in fact some of the best meat I ever tasted.

## 19. BETTONGIA RUFESCENS.

Rufous Bettongia.

Kangaroo Rat.

This animal, so common in the neighbourhood of Sydney, has not been observed by me to the westward of the Murrumbidgee, where *Bettongia penicillata* appears to take its place. Not a single specimen was procured by the natives during my stay at the Darling Junction; so that I have no doubt about the extent of its range. This animal is easily tamed, and I have kept a young one about the size of a large rat for several weeks. The little animal often followed me upon my excursions, seeking shelter upon the approach of danger by creeping between my boots and trousers.

Only one young is brought forth in June, though the pouch contains 4 teats. The flesh of this animal is also very palatable.

## 20. BETTONGIA PENICILLATA.

Pencil-tailed Bettongia.

Pattuck of the Murray natives.

The smallest of the whole family, nocturnal in its habits. Those occasionally seen during the day time have been disturbed.

It is not very quick, and is easily caught, even by common dogs. I have from time to time kept numbers of these animals in captivity in an enclosure of pine logs about seven feet high, which they used to climb with a nimbleness truly astonishing, and thus often escaped. During the day time I always noticed these creatures crouching into some corner; the tail brought forward between the hind legs, the head between their paws; fast asleep. I noticed that they are very partial to the thick clusters of *Polygonum* scrub so frequent on the Murray.

Female specimens, with never more than 1 young attached to one of the 4 teats, were frequently brought to me by the natives. Single specimens, with a white brush at the end of the tail, occur occasionally.

This *Bettongia* and *B. Ogilbeyi* appear to be so closely allied to each other that I should consider them the same species.

#### 21. BETTONGIA GRAII.

Gray's Jerboa Kangaroo.

Booming of the Murray natives.

This burrowing *Bettongia* has long retreated before the herds of cattle with which the plains bordering on the Murray are now stocked; and it is no longer to be found south of that river, so, at least, the natives assured me, and whenever we went out hunting for it, we always had to cross to the New South Wales side.

Not a single specimen of my collection was procured in Victoria. Although this species is constantly furnished with a brush of white hairs at the end of the tail, I consider it identical with Gould's *B. Graii*, in which the white mark is wanting.

It is a truly nocturnal animal, which always leaves its burrow long after the sun is down, in fact, never before it is quite dark. I often watched near their holes, gun in hand, listening to their peculiar call; but I always had great difficulty in procuring specimens, as they are very shy, and hardly to be distinguished from the surrounding objects.

The best plan is always to dig them out; an operation in which the black-fellows are very expert, though it is rather tedious work; the holes running into each other, and being

sometimes ten feet deep ; and several shafts may have to be sunk, before a couple of "Boomings" can be secured.

I have often seen several acres of ground covered with their holes.

I have no doubt that this, and, perhaps, many of the other species, breeds several times during the year, but brings forth one young only. The pouch of the female is furnished with 4 teats.

It is difficult to keep them in captivity, as they are very wild indeed ; and either escape by a burrow, or kill themselves in running their heads against the enclosure.

These are all the Marsupial animals proper which I have observed ; it will however be necessary to say a few words about the sub-class of the Marsupial Group, the Monotremata, which is represented by the following species.

## 22. ORNITHORHYNCHUS ANATINUS.

### The Duck-billed Platypus.

This singular animal does still exist in most of the tributaries of the Murray, as the Loddon, Avoca, Campaspe, &c. It is extremely shy, and little is yet known about its habits and economy. It burrows into the river bank from below the water level, and according to Bennett, brings forth 3 young ones at a time ; some found by that naturalist were one inch and seven-eighths in length. Its food consists of fresh water worms, mollusca, worms, insects, &c.

This is about all we know of the *Platypus*, and cannot I do better for the benefit of science than draw attention to Professor Owen's remarks in his elaborate paper on the monotremata ; The great anatomist says :—

"The principal points in the generative economy of this paradoxical species still remain to be determined by actual observation.

1. Manner of copulation.
2. Season of copulation.
3. Period of gestation.
4. The nature and succession of the temporary structures developed for the support of the foetus during gestation.
5. The exact size, condition, and powers of the young at the time of birth.

6. The act of suckling.

7. The period during which the young requires the lacteal nourishment, and the age at which the animal attains its full size."

Knowing that many gentlemen in the country take great interest in Natural History, and have frequent opportunities of observing the *Ornithorhynchus*, I beg to draw their attention to the questions yet to be solved.

#### 24. ECHIDNA HYSTRIX.

##### The Spiny Echidna.

This singular animal, of which I have seen two preserved skins at Mount Hope, is almost less known than the Platypus. Its geographical range does not extend far into the flat country, and it is generally found in mountain ranges among rocks and stones; a shepherd at Mount Hope assured me that the animals which he had preserved were captured at the mount; the natives further down the river did not appear to be aware of the existence of such an animal as the Echidna; their food is said to consist principally of ants and their eggs, though I have kept many in captivity and offered them the food mentioned, but without success. Upon hen-eggs they subsist for some time; they also like bread and milk, but seldom live longer than two or three months in captivity. I have reason to believe that, strange as it may appear, the Echidna lives upon grass also, as I have examined several which had the intestines full of digested grass or herbs.

Of the generation of this species nothing is as yet known, nor have I ever seen a very young Echidna, none at least less than six or eight inches long.

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#### REPTILIA.

To investigate the Reptilian fauna of a country, a longer stay than six months is necessary, and the species which I am going to enumerate must be considered as but a small portion of the reptiles inhabiting those districts. The country consists of large plains without a stone upon them, studded with salt-bush,

pine forests, or mallee scrub, affording the agile reptiles unusual facilities for escape during the summer. In the cold season these creatures, owing to the nature of the country, retreat into the ground, so that they can only be obtained with great difficulty; and this is the cause that the collection made during my sojourn on the Murray was but a scanty one.

Those which were observed belonged to the following genera:—

CHELONIA.		1. <i>Chelodina</i> .
	a. Leptoglossæ.	2. <i>Hydrosaurus</i> .
		3. <i>Pygopus</i> .
		4. <i>Lialis</i> .
		5—7. <i>Hinulia</i> .
		8. <i>Mococa</i> .
SAURIA.	b. Geissosaura.	9. <i>Siaphos</i> .
		10. <i>Trachydosaurus</i> .
		11. <i>Cyclodus</i> .
		12. <i>Tropidolepisma</i> .
	c. Pachyglossæ.	13—15. <i>Diplodactylus</i> .
		16—18. <i>Phyllurus</i> .
		19—22. <i>Grammatophora</i> .
	not venomous.	23. <i>Morelia</i> .
		24. <i>Acanthophis</i> .
OPHIDIA.	venomous	25—26. <i>Diemenia</i> .
		27—28. <i>Pseudechis</i> .
		29. <i>Hoplocephalus</i> .
		30. <i>Limnodynastes</i> .
BATRACHIA.		31—33. <i>Hyla</i> .
		34. <i>Pelodyras</i> .

## CHELONIA.

### I. CHELODINA LONGICOLLIS.

The long-necked Tortoise.

This aquatic reptile is found in considerable numbers in the Murray and its tributaries. It affords food to the natives, especially during the summer, when the lagoons are dry, as it can

then be procured in large numbers without difficulty. Their eggs, which are deposited in the beginning of January, amount to 15 or 20, perhaps even more, as the natives, who consume them in quantities, informed me.

Like all tortoises, the present species is very tenacious of life. On one occasion, a specimen was brought to the camp pierced by a spear: for the sake of experiment, it was put into a case, and kept for a few months, at the end of which, the wound was found completely closed, and the animal as lively as if nothing had happened to it.

## S A U R I A .

### 2. HYDROSAURUS VARIUS.

#### The Lace Lizard.

I believe the present striped species, and the large spotted or Gigantic Lace Lizard (*H. giganteus*) to be identical; this is one of the most common forms on the plains of the Murray; so common, in fact, that I have often captured half a dozen of them on my return to the camp; they were generally found basking in the sun, close to their holes, down which they disappeared with extraordinary swiftness when disturbed. They grow to a large size, as much as 7 or 8 feet long, and feed upon carrion, as well as upon living animals; on various occasions several pounds of bones, and once a large "opóssum" was taken from the stomach of one of these reptiles.

Their eggs, of which they deposit some 10 or 15, are large, covered with a tough leathery membrane; the young lizards being more than 10 inches long, at the time of birth.

The present species is well distributed over almost every part of Australia.

### 3. PYGOPUS LEPIDOPODUS.

#### The Pygopus.

This, at first appearance, snake-like form, is occasionally met with, but not so frequently as other Lizards: its flat tongue, the two rudimentary limbs near the anus, and its ear-holes, easily distinguish it from a true snake.

The number of eggs deposited by the present species, seldom exceeds 3 or 4, they are of very elongate form, 3 or 4 times as long as they are broad, and are generally hatched by the powerful rays of the sun in 3 or 4 weeks. This lizard also has a very wide distribution.

There has been a second species of *Pygopus* observed on the Murray, marked with much more brilliant colours than any hitherto known; but owing to the mutilated state of the specimen which was captured by the natives, it was found impossible to preserve it or give a correct description thereof.

#### 4. *LIALIS BURTONI*.

Burton's *Lialis*.

This is another snake-like form, with pointed muzzle, a single specimen of which came under my notice; its range is very extensive, as I have at various times received specimens from the Clarence River, and from farther north. Sir George Grey mentions its occurrence in Western Australia. In its habits, it is similar to the *Pygopus*.

#### 5. *HINULIA ELEGANS*.

Elegant *Hinulia*.

#### 6. *HINULIA AUSTRALIS*.

Australian *Hinulia*; and

#### 7. *HINULIA TENUIS*.

Slender *Hinulia*.

Are three species of Scincoid Lizards, occasionally observed. The first is generally found beneath the rough bark of trees. I believe that there are many more representatives of the genus *Hinulia*, but owing to their nimbleness, it was impossible to capture many of them. The number of eggs deposited by these Lizards has not been ascertained correctly; perhaps they are viviparous, and if so, may bring forth 10 to 12 young.

#### 8. *MOCOA TRILINEATA*.

New Holland Moco.

This widely distributed small Lizard has been frequently

captured, it is very common under bark, or among dead leaves or branches. Its eggs are deposited among decomposed leaves in moist places, and are from 10 to 16, and perhaps more in number. I have often taken as many as 50 out of one of these breeding places, but I believe that they were the produce of several lizards.

In the neighbourhood of Sydney, where *M. trilineata* is very common, the eggs are generally laid between the fronds of the so called "Staghorn fern."

#### 9. SIAPHOS EQUALIS.

The Siaphos.

This is another small Lizard, with very short three-toed limbs; it frequents shady or dark places, and lays but a limited number of eggs.

#### 10. TRACHYDOSAURUS RUGOSUS.

Rugose Stump-tail.

A large, lazy, and very common kind of Lizard, generally known as the "Sleeping Lizard," which frequents open sandy plains, and may be captured in large numbers during a hot summer's day.

The number of young produced, seldom exceeds 4, those dissected by me had 2 embryos only. I believe these Lizards do not inhabit the east coast, at all events they are not found near Sydney, or at the Hastings or Clarence Rivers.

In Western Australia, particularly in the neighbourhood of King George's Sound they are very common.

#### 11. CYCLODUS GIGAS.

Giant Cyclodus.

Whether this species is identical with the large *Cyclodus* of the east coast I cannot at present determine. Peters has described a *Cyclodus* from South Australia, and Dr. Schomburgk who discovered this new species informs me that our common Giant *Cyclodus* does not exist near Adelaide; if this is correct, the *Cyclodus* found on the Murray, would be referable to Peters' *C. occipitalis*.

One or two specimens of this Lizard were captured by the natives.

I had been always under the impression that these reptiles produced 2 or perhaps 3 young only, but not long ago I dissected a large female specimen and took therefrom fifteen well formed young, each about from 5 to 6 inches long.

This species is prized by the natives as an article of food.

#### 12. TROPIDOLEPISMA KINGII.

King's Tropicolepisma.

This species, (the smallest of the genus) is alone found on the Murray, its range extends almost from the east to the west coast, though in the immediate neighbourhood of Sydney it does not occur.

The number of eggs or young produced by this Lizard has not been ascertained.

#### 13. DIPLODACTYLUS VITTATUS.

Yellow Crowned Diplodactyle.

This little Gecko is rather rare, as not more than 5 specimens were procured through the natives during my stay on the Murray; its distribution is very extensive, and, in fact, includes almost every part of Australia. The Australian Museum is in possession of specimens from the North East Coast, from the Murrumbidgee, and from South and West Australia. Near Sydney this species is tolerably common. It is oviparous, producing about 6 eggs.

#### 14. DIPLODACTYLUS ORNATUS.

Beautiful Diplodactyle.

I do not think that there is another species of Lizard, so common and so widely distributed as this; every tree along the river banks harbours large numbers of them, and wherever a piece of dry bank is removed, this little Gecko is sure to be found beneath, in company with various species of Coleoptera, Blattæ, and spiders. In stony localities it frequents the shady side of rocks, &c. In its habits this Lizard is truly nocturnal.

15. *DIPLODACTYLUS OCELLATUS.*

## The Eyed Diplodactyle.

Of this rare Lizard a few solitary specimens were captured, and these were in bad preservation and scarcely to be recognized. The Museum has, however, lately received well preserved specimens from the Murrumbidgee, through the kindness of Mr. William MacLeay, M.L.A., so that I am able to enumerate this Gecko, as inhabiting the Murray Plains.

16. *PHYLLURUS PLATURUS.*

## Broad-tailed Gecko.

17. *PHYLLURUS INERMIS.*

## Spineless Gecko.

18. *PHYLLURUS MILIUSII.*

## Thick-tailed Gecko.

Have been obtained in the McIvor ranges and near Mount Hope; on the Murray Plains, no specimens were observed, though they may exist there. These three Geckos are common near Sydney and at the Clarence and Richmond Rivers; the last mentioned species also occurs in Western Australia.

19. *GRAMMATOPHORA CRISTATA.*

## Crested Grammatophora.

The distribution of the present species does not extend, as far as my experience goes, beyond the mountainous districts; upon the dividing range specimens were frequently observed, but in the plain country they disappeared. The natives informed me that this lizard existed near Mount Hope, but they never captured it.

Near Sydney, where this species is common, it is generally found in the neighbourhood of water, diving into it when disturbed and remaining at the bottom for a considerable time. Specimens which I have in captivity, would lie at the bottom of a water vessel for hours without coming to the surface to breathe. I have watched one under water for more than forty minutes, I was then called away, but on my return half an hour afterwards I could not see the least indication that the lizard had stirred;

again I watched it for some twenty minutes longer, and gave it up at last, the reptiles being apparently under no necessity to breathe.

20. GRAMMATOPHORA MURICATA.

The Common Grammatophora.

This is a well-known and very common species found in nearly every part of Australia. It is fond of basking in the sun, and may be frequently observed sitting motionless on old stumps upon road side fences, &c. From 5 to 8 eggs are generally produced, and deposited in the sand.

21. GRAMMATOPHORA ORNATA.

Yellow spotted Grammatophora.

This species is found in large number upon all the open plains, every tuft of grass and every salt bush sheltering several of these gaily coloured creatures; they vary considerably in their markings, more so even than the previous species *G. muricata*. The number of eggs produced amounts to about 8.

22. GRAMMATOPHORA BARBATA.

Bearded Grammatophora.

This formidable looking reptile is better known under the name of "Jew Lizard." It cannot be considered a common form on the Murray, but its distribution extends from the East to the West Coast; how far it ranges North I have not been able to ascertain, I know however that it occurs at Wide Bay, and is probably found all over the continent.

The number of eggs produced by this reptile is most likely from 6 to 8, perhaps more.

OPHIDIA.

23. MORELIA VARIEGATA.

The Carpet Snake.

I am inclined to think that the Carpet Snake and the Diamond Snake are identical, varying in colour in different localities; Carpet Snakes occur in every part of Australia, the

South East Coast excepted ; they differ from the Diamond Snake in nothing but their markings, which consist of a series of brown blotches with darker margins, whilst the Diamond Snake is of a glossy bluish black, with a bright yellow spot in the centre of nearly every scale.

The Carpet Snake does not appear to be so common on the plains or in the mountain districts, and a single specimen only was secured ; this snake feeds upon birds, small mammals, &c., and produces a large number of eggs ; from 20 to 30 as the natives informed me.

24. *ACANTHOPHIS ANTARCTICA.*

The Death Adder.

Of this highly venomous snake, I obtained but a single specimen at Lake Boga ; it brings forth about 10 or 12 young ones.

25. *DIEMENIA PSAMMOPHIS.*

Grey Diemenia.

The present species so common near Sydney is not often met with on the Murray, only one specimen being secured during 6 months ; its bite is not considered dangerous, causing only a slight irritation, not as bad as the sting of a bee ; the total length seldom exceeds 3 feet.

26. *DIEMENIA SUPERCILIOSA.*

Brown Snake.

A species, which like many others, ranges from the East to the West Coast, and perhaps extends over the whole continent, as I have received specimens from Cape York. Near Sydney, and along the East Coast, the young are distinctly black, banded with a black patch upon the head ; but the young found on the Lachlan and in other localities to the westward are not banded. I have received specimens from Adelaide which are plain coloured with black patches upon head and neck, but without bands. In a few years these bands and black spots disappear more or less, and the adult snake is generally of an uniform brown color ; there are some individuals on the coast, however, in which the bands may be traced when full grown. In the specimens taken on the Murray no bands or black marks could be detected.

This snake is highly venomous, and produces some 20 eggs, which are deposited in the sand under some bramble or decayed leaves ; it is frequently confounded with the following species.

27. PSEUDECHIS AUSTRALIS.

Yellow-bellied Brown Snake.

Hitherto considered to be a variety of the Black Snake, from which it differs in nothing but the colour, being brown above and yellow or orange beneath. This Snake does not occur near Sydney ; but it appears to be common as far north as Port Denison, from whence specimens have been obtained.

It is highly venomous.

28. PSEUDECHIS PORPHYRIACUS.

Black Snake.

One of the most common and most venomous Snakes, distributed over almost every part of Australia, common on the Murray, and producing some twenty young annually.

29. HOPLOCEPHALUS CURTUS.

Brown-banded Snake.

This, the most vicious of all our reptiles, closely allied to the Indian Cobra, is very common on the plains, in particular in the reed-beds near Swan Hill, and in other swampy places ; the natives appear to be in great dread of this reptile, and assured me that its bite was certain death.

This species is also found in almost every part of Australia.

These are all the Snakes actually observed by me, but no doubt they do not represent all the species which exist in these extensive plains.

BATRACHIA.

FROGS.

Of this order not many species were collected.

30. LIMNODYNASTES DORSALIS.

Striped Swamp Frog.

In a reed-bed near Lake Boga a single specimen was

obtained. It is a common species near Sydney, on the Clarence River, near Rylston, and in many other localities.

31. *HYLA AUREA*.

## Common Golden Tree Frog.

This species, widely distributed over Australia, is the most common of all our Batrachians: the natives when pinched for food capture large numbers of it by the light of a torch at night; a supply of this frog can always be secured wherever there is fresh water near.

32. *HYLA PERONII*.

## Yellow-Legged Tree Frog.

This species, which ranges also over a great part of the continent, is generally found during the day-time under the bark of the "Flooded Gum" (*Eucalyptus rostrata*).

33. *HYLA ADELAIIDENSIS*.

## Adelaide Tree Frog.

This species is not common on the Murray; its range extends as far as Western Australia.

34. *PELODRYAS CÆRULEUS*.

## Great Green Tree Frog,

The largest of our Batrachians, found in every part of Australia, and in New Guinea. I have seen specimens as large as a man's fist. This species feeds upon almost every living object that can be swallowed: lizards, frogs, all kinds of insects, and young birds—for I have once taken the nestling of a small honey-eater out of the stomach of one of these insatiable reptiles.

This concludes my notice of the reptilian fauna of the Lower Murray, which, as before mentioned, will prove much richer both in genera and species than it appears at present to be. I could enumerate some 5 or 6 more species, but these were in such bad preservation that it was found impossible to determine their character with certainty.

## ON SNAKES

*Observed in the neighbourhood of Sydney.*

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HAVING paid much attention to the reptiles found near this city, I am now able to give an account of the snakes to be met with in the vicinity, and to point out which of them may be considered dangerous to man or larger animals.

There are four highly venomous snakes observed to inhabit nearly every part of Australia, while a fifth large venomous species exists besides these on the North-west coast; and these are the only dangerous ones known to us as yet.

All the remaining species, as far as my knowledge goes, are too small to inflict a dangerous wound.

In the beginning of spring, when reptiles re-appear, there is generally a great supply of snake stories brought before the public by the daily press, but it is of very rare occurrence that we hear of death being caused by the bite of any of these animals.

If we compare our reptile-fauna with other countries under the same latitude, I think that we have sufficient reason to be thankful for the absence of the deadly Vipers, the Rattlesnakes and Puff-adders of India, America, and Africa—all of which have fangs an inch or more in length; we actually have not yet discovered a single species in which the teeth exceed one-fourth of an inch, and I doubt whether any of our snakes can inflict a wound through ordinary cloth or a common leather boot.

All our venomous snakes belong to the second sub-order of the class Ophidia, viz:—to the Colubrine snakes with permanently erect immoveable fangs in front. Of innocuous, or not venomous Colubrine snakes, we have three species near Sydney, all of which are Tree-snakes. If we except the Diamond snake, which belongs to the Boa family, we find that all not venomous

Colubrine snakes may be easily distinguished from the venomous species by the deep curve which the gape of the mouth forms; whilst, in the venomous snakes, the gape is always a more or less straight line. In the members of the Boa family the line is straight, as in venomous snakes, but these are easily distinguished by the rudimentary limbs, in shape like a small spur situated near the anus.

I have added Dr. Günther's description of the two species of Sea-Snakes which occur on our coast; both of which may be considered harmless, having only very small fangs—and I take this opportunity to thank that eminent naturalist for the kind assistance he has so frequently rendered me. I also beg to assure those contributors to the Museum who have furnished me with the means of adding to the knowledge of our Reptiles, that I shall always consider myself under deep obligations to every one of them.

#### FIRST SUBORDER.

#### OPHIDII COLUBRIFORMES INNOCUI.

#### INNOCUOUS COLUBRINE SNAKES.

Snakes without grooved fang in front, comprising the following families:—

1. *Typhlopidae*, or Blind Snakes.
2. *Dendrophidæ*, or Tree-Snakes.
3. *Dipsadidæ*, or Nocturnal Tree-Snakes; and
4. *Pythonidæ*, or Rock-Snakes.

#### 1.—TYPHLOPIDÆ; OR BLIND SNAKES.

Typhlops. *Schneid.*

Typhlops rüPELLI. *Jan.*

The Blind Snake.

Scales in 22 rows. Rostral large and broad above, narrowing below; Preoculars much larger at the base than at the tip, third upper labial in contact with the ocular and preocular. Anterior scales smaller than the posterior ones. Tail short, cylindrical,

very obtuse, three times the length of its diameter, and ending in a small spine.

The color of this harmless little reptile is brownish grey above, and yellowish below; each scale of the back being bordered with yellowish white, the markings becoming obsolete towards the tail; the form is cylindrical, enlarging towards the tail.

Of all our harmless snakes, the present species is the least offensive; it lives under ground, and is frequently found in Ants' nests, upon the larvæ of which it principally exists; its total length does not exceed 18 inches. I believe that the present species has a very wide range, and that it will be found to inhabit the greater part of the Australian Continent; specimens from the Murray River, from South Australia, and from Queensland are in the collection of the Australian Museum.

## 2.—DENDROPHIDÆ; OR TREE-SNAKES.

*Dendrophis. Boie.*

*Dendrophis punctulata. Gray.*

The Green Tree-Snake.

Scales in 12 or 13 rows.

Anal bifid.

Ventrals 207.

Subcaudals 106/106.

Of slender form, above green or pale olive brown, beneath bright yellow, sides and under parts of head the same colour; eyes large, pupil rounded. Outer edge of scales white, as may be seen on stretching the skin.

1 anterior 2 posterior oculars, scales smooth, those of the vertebral row much larger, polygonal; scales of outer rows elongated, narrow, quadrilateral, and very imbricated.

Maxillary teeth smooth and of equal length.

This snake, one of the few not venomous Australian species, is a gentle harmless creature, which at any time may be handled with impunity; it never attempts to bite, and of many hundred

individuals which I had an opportunity to observe alive, not a single one could be induced to inflict a wound.

If we except Tasmania and the southern part of Victoria, we find the Green Tree Snake from north to south, and from east to west; it frequents trees, feeds upon insects, frogs, lizards, small birds and birds' eggs, and grows to a considerable length, but seldom if ever exceeding 6 feet.

I have reason to believe that the female is oviparous, laying about 20 or more eggs in November or December; young individuals differ considerably from the adult in colouring, being not of so bright a green; and having a grey instead of a light yellow belly. The winter is generally passed under hollow logs or beneath flat stones in sunny but often damp localities.

### 3. DIPSADIDÆ, OR NOCTURNAL TREE-SNAKES.

DIPSAS. *Auct.*

DIPSAS FUSCA *Gray*;

The Brown Tree-Snake.

Scales in 19 rows.

Anal entire.

Ventrals 236.

Subcaudals 87/87.

Form slender, body and tail compressed, elongate head much depressed, triangular, broad behind, very distinct from neck; scales on the vertebral line much larger, regularly six-sided, vertical shield broad, occipitals obtuse behind, one loreal; eight upper labials, the third and fourth and sometimes the fifth touching the orbit; one anterior two posterior oculars; eye large, pupil elliptical; nostril moderate, between two shields; posterior maxillary teeth longest and grooved.

Above, light brown or reddish brown, with numerous black rather oblique, sometimes obsolete cross bands; belly uniform salmon coloured.

The present species has not been so much noticed in the neighbourhood of Sydney as the Green Tree-snake, but this may

be owing to its nocturnal habits ; it is found along the East Coast, and ranges as far as Port Essington ; individuals observed in captivity appeared very gentle in disposition, and could be freely handled without showing any inclination to bite, they passed the day coiled up amongst the branches of trees, but became very active at night, noiselessly gliding through the foliage in search of their prey, which, as in the Green Tree snake, consists of birds, birds' eggs, insects, frogs, lizards, and the smaller mammalia.

I am unable to state whether the female is oviparous or not ; the number of young produced annually does probably not exceed 20. Total length of adult about 6 feet.

#### 4. PYTHONIDÆ, OR ROCK-SNAKES.

MORELIA. *Grey.*

##### MORELIA SPILOTES. THE DIAMOND SNAKE.

Scales in 47 rows.

Ventrals 276.

Anal bifid.

Subcaudals 80/80.

Head shields small, scale-like ; three pairs of distinct frontal plates, vertical plate indistinct, rostral shield with a pit on each side, first and second upper labials pitted ; of the lower labials the first seven are smooth, then follow seven deeply pitted scales, and 3 or 4 smooth ones, nostrils lateral, in a single plate with a groove beneath ; eyes lateral ; pupil elliptical, erect ; scales smooth ; subcaudal plates in two rows, two spur-like appendages near the vent.

Coloration :—

Bluish black above, almost every scale with a yellowish (white in spirits) elongate spot in the centre ; there is a series of dark-edged irregular blotches upon the back, each bearing in the middle a few very bright yellow-colored scales ; these spots or blotches vary considerably in different individuals, specimens from Port Macquarie having almost the markings of the Carpet Snake, but still retaining the yellow spot in each scale, which in

*M. variegata* is wanting. Some specimens occur with a pale yellow streak from the side of the head to the vent: in fact we very rarely find two of these snakes which do not differ considerably in their markings.

The range of the Diamond Snake (*M. spilotes*) is restricted to a very limited area of country, being found in no other part of Australia than from Port Macquarie to Jervis Bay, or perhaps Cape Howe; and from the coast to the western slopes of the Blue Mountains and the Liverpool Range. In the plains watered by the Lachlan, the Murray and the Murrumbidgee, the present species is not found, the Carpet Snake (*Morelia variegata*) taking its place there.

The Diamond Snake is a common species in the county of Cumberland, in the Blue Mountains and the Illawarra district; it is a harmless creature, which may be picked up by any body without ever offering to bite; though it is a strictly nocturnal snake, individuals are nevertheless met with during the day-time, either basking in the sun and digesting their food, or, having been disturbed, in search of a place of shelter. Like the other species of the family Pythonidæ, they prey upon birds, and the smaller species of Mammals; young individuals feeding upon insects, frogs, or birds' eggs; the female deposits 30 or more eggs in December or January, which in a month or two the sun brings to maturity. I am not aware that the mother cares any longer about her progeny, after laying the eggs; and I have never seen or heard of a single instance where she coiled herself upon the eggs so deposited.

Diamond Snakes are found in almost every kind of country as long as it offers sufficient shelter; they prefer open stony ridges studded with low trees and well supplied with water, the edges of swamps and lagoons are frequented by them, as they find there a considerable supply of Water-rats (*Hydromys*), young Ducks, and other water-fowl; they also often visit the hen roosts of the farmer, or surprise "Opossums" (*Phalangista*) or "Flying Squirrels" (*Petaurus*), upon the branches of high *Eucalypti*.

The largest specimen, to my knowledge, that has been captured near Sydney, and properly measured, without being stretched, was 10 feet 3 inches long; that individuals of 11

feet or more in length occur, I doubt not, though they are very rare indeed, and have never come under my notice.

The way in which Diamond Snakes capture their prey is as follows :—

The snake suspends itself from the branch of some low bush or tree and watches for the victim, which often plays about near its unseen enemy. The reptile, with its neck and head bent into the form of an S, deliberately measures its distance, uncoiling more of its body if necessary, and often almost touching the animal it is in wait for ; as soon as the snake is sure to reach its victim, it darts forward, generally catching the prey by one of the hind legs, and instantly takes a turn around its body, soon extinguishing life through its powerful pressure. As soon as the animal is quite dead, the process of swallowing begins, the snake always commencing with the head ; this done, the reptile will often for days together bask in the sun, until the food is so far digested as to impede its movements no longer.

If a snake is disturbed during this state, it will almost always throw up the half digested carcass.

In a state of nature they never touch any food, except living animals. I once, however, observed a Diamond Snake, which was kept in a cage, swallow a rat which had been killed by a Brown-banded snake (*Hoplocephalus curtus*.)

The present species is greatly infested by various kinds of Intestinal worms, including a Tape worm, clusters of which I have frequently taken from the stomach of this reptile.

Before concluding, a few remarks will be necessary with regard to the Carpet Snake (*Morelia variegata*).

There is very little, if any difference in the distribution and number of scales between the Diamond and Carpet Snakes, the only character in which both snakes vary, is the coloration ; the first having a yellow spot in the centre of each scale, whilst the latter has the back ornamented with numerous irregular black edged brown blotches ; the belly, as in the Diamond Snake, being yellowish. I have mentioned before the remarkable fact, that the Carpet Snake is found in every part of Australia, except the Coast District, say from Cape Howe to the Hastings, and about 100 miles

inland ; at Port Macquarie both species occur, but at the Clarence River, according to Mr. James F. Wilcox, the Carpet Snake alone is found. Dr. J. E. Gray has indeed tried to distinguish the one from the other by the vertical plate, which he considers distinct in *Morelia variegata*, and indistinct in *M. spilotes*. But after examination of large numbers of both species, I do not think that the above is a character much to be relied upon, and I am led to believe that both Snakes are but varieties of the same species.

There is, according to Duméril and Bibron, the famous French Herpetologists, a second species of Snake of the Boa family to be found near Sydney, namely,

The Bolyeria, *D. & B.*

*BOLYERIA MULTICARINATA. D. & B.*

This, however, is not the case. I have hunted the country near Sydney for years, and have never come across a single snake of this description ; high rewards have been offered for it, with no better success, and no specimen ever existed in the Australian Museum. I have, however, lately purchased a snake which answers to the description given, and which was obtained at some of the islands near New Guinea.

#### SECOND SUBORDER.

#### *OPHIDI COLUBRIFORMES VENENOSI.*

#### VENOMOUS COLUBRINE SNAKES.

Snakes with an erect immoveable grooved or perforated fang in front of the maxillary.

Gape of mouth forming a straight line.

This suborder, if we include the genus *Acanthophis* with the first family, comprises the

1. *Elopidæ* or Elapides ; and the
2. *Hydrophidæ*, or Sea-Snakes.

## 1. ELAPIDÆ; OR ELAPIDES.

Diemenia. *Gray.*Diemenia psammophis. *Schleg.*

The Grey Snake.

Scales in 15 rows.

Anal bifid.

Ventrals 177.

Subcaudals 85/85.

The present species has been described by Dr. Günther as *D. reticulata*, under which name I have frequently alluded to it. It appears, however, that the snake to which Günther refers in his *Cat. of Colubrine Snakes*, when quoting Schlegel's figure (*Abbildungen* Tab. 46, No. 14), is that author's *D. psammophis*, which name has the priority, and ought to be adopted instead of, *D. reticulata*. The coloration is a uniform grey above, and greenish below, the central part of the ventrals being conspicuously marked with green; tips of scales and skin between them, black; and of tail, salmon colour; a yellowish dark edged streak crossing the rostral shield. The eye is encircled first by a black and then by a yellowish line, both ending in a point below the orbit.

The present species is found in nearly every part of Australia, the extreme North and South excepted. I have taken it eight years ago on the Murray and Darling, and since then specimens have come to hand from Brisbane, Port Curtis, and Rockhampton. All these snakes differ no more from those of Sydney than these do amongst themselves. Much dependence can never be placed upon coloration as a distinguishing character in snakes, as in this no two reptiles vary so much as a snake about to shed its skin differs from itself after this operation has been successfully performed. I believe the present species to be the most common in our neighbourhood.

It frequents sandy localities, feeds on insects, small frogs, lizards, &c., and its bite does not cause any more irritation than the sting of a bee; from 15 to 20 eggs are deposited by the

female under stones exposed to the sun, generally in the beginning of December, and perhaps earlier, as I have on more than one occasion taken the young snakes at the end of that month and in the beginning of January. This reptile is generally found from two to three feet in length, very rarely exceeding four feet. During the cold season the grey snake retires under flat stones exposed to the sun; it very seldom, if ever, goes into the ground; it is very sensitive to cold, and the least frost suffices to destroy it. I have found sometimes five and more of these reptiles under the same stone.

*Diemenia Superciliosa.* *Fischer.*

Ringed *Diemenia.*

Scales in 17 rows near neck.

Scales in 15 rows near tail.

Subcaudals 73/73.

Anal bifid.

Ventrals 228.

Superciliaries larger than vertical; occipitals widely forked, rounded, broad; rostral high, reaching to the surface of crown; one nasal, one anterior, two posterior oculars; superciliaries prominent above the eye; anterior ocular grooved near the top; posterior frontals much larger than the anterior ones, bent down on the sides and with nasal, anterior ocular, and second and third upper labial replacing the loreal; belly flat. Dark brown above, a lighter band just crossing behind the occipitals; side of face and chin much lighter than the other parts of the body; belly yellowish, sides of ventrals and lower edge clouded with purple grey, forming a series of irregular blotches, each ventral with a distinct darkish streak on its lower edge. Half-grown and sometimes adult individuals show traces of from seventy to seventy-five black rings, which in the young snakes are very distinct. The following description is applicable to young specimens up to three years old:—

Muzzle light brown; a black triangular spot covering the region between the eyes and the occiput as far as the hinder margin

of the occipitals—this streak is bent down on the sides of the face, and behind this dark spot is a white narrow streak and another broad dark band reaching down to the edge of the labial shields; then follows again a white streak and a second black band, but much smaller than the previous one, and so alternately a broader brownish and a narrow black band to within an inch of the apical half of the tail; the black bands are occasionally interrupted, leaving a blank on the other side of the body; including these interrupted streaks, from seventy to eighty may be counted upon body and tail, seventy-five is the usual number. The belly in young and half-grown individuals is covered with yellowish spots, which at a more mature age form into the black blotches mentioned in the description of the adult.

The great difference in the coloration of young half-grown and adult individuals has given rise to a variety of names: for some time I tried in vain to reduce them, but at last succeeded by bringing together a complete series of this snake in various stages of growth, from the egg upwards. Dr. Albert Günther to whom drawings as well as specimens in good preservation were submitted, states in a paper read before the Zoological Society of London,

“The young specimens, then, found by Mr. Krefft, do not belong to *Furina textilis*, Duméril and Bibron, which has three posterior oculars, but to *Diemansia annulata*, described by myself in ‘*Colubr. Snakes*,’ p. 213. And the old individual sent by Mr. Krefft is identical with *Pseudaelaps superciliosus*, Fisch. Mr. Jan, of Milan, (who says that he has examined the Snakes of the Hamburg Museum) describes the adult Snake under two names, *Pseudaelaps sordellii* and *Ps. kubinyi*, the latter being founded upon an accidental variety, in which some of the head shields are confluent. The synonymy of this species therefore would be:—

*Diemansia superciliosa*.

an Adult.

1856. *Pseudaelaps superciliosus*. Fisher in *Abhandl. Geb. Naturwiss.* III., part 107., taf. 2 fig. 3. (head not quite correct).

1859. *Pseudaelaps sordellii*. Jan in Rev. and Magaz. Zool.  
pl. C. (head).

1859. *Pseudaelaps kubinyi*, Jan, l. c. (founded on an accidental  
variety) C. (young).

1858. *Diemansia annulata*, Günth. Colubr. Snak., p. 2 B.

1862. *Furina textilis*, Krefft, Proc. Zool. Soc. p. 149."

The geographical range of this species extends over almost every part of Australia, as I have seen specimens from Cape York, Adelaide, the Murray, and other localities. When full grown, this Snake may be dangerous to man; in its habits it is diurnal, and found generally in rocky localities; young Snakes are frequently found under stones during the cold season, while those of a more mature age retire into the ground.

BRACHYSOMA. *Günther.*

*Brachysoma diadema. Günther.*

The Red-Capped Snake.

Scales in 15 rows.

Anal bifid.

Ventrals 175.

Subcaudals ?

Body elongate and rounded; head flat, distinct from neck; muzzle broad and obtuse; rostral high, slightly grooved, reaching to surface of crown; one nasal pierced by the large nostril; anterior oculars triangular, posterior one much larger, five-sided and bent down on the sides; occipitals moderate, rounded, scarcely forked behind; 6 upper labials, the third and fourth forming the orbit; eye small, pupil sub-elliptical, erect. Two temporal shields, the upper in contact with both post oculars, the lower much larger, wedged in between the last two labials.

Above, purplish brown, each scale with yellow centre very distinct in the first 4 or 5 rows on each side; head and neck black above, except a lunated spot just behind the occiput, which is brick-red, and turns white in spirits.

Beneath yellowish, front of lower jaw with a black spot.

“Upper jaw with grooved fang in front, separated from the other teeth by an interval; an elongate series of six or seven teeth behind; palatine teeth equal in length; anterior teeth of lower jaw longest.” (*Günther.*)

This very handsome little Snake is not uncommon near Sydney, though few people have ever seen it; during the cold season I have met with specimens under thin flat stones at Manly, Lane Cove, and other rocky localities; before I had an opportunity of proving its existence near Sydney, it had been known from Western Australia and the North East coast only. This Snake is venomous, but never offers to bite, and may be handled with impunity; it is oviparous, laying from 8 to 10 eggs. Its food consists, like that of other small species, in minute *Blattæ*, young frogs of the genus *Pseudopkryne*, ants, ants' eggs, &c.

PSEUDECHIS. *Wagl.*

*Pseudechis porphyriacus.* *Shaw.*

The Black Snake.

Scales in 17 rows.

Anal bifid.

Ventrals 180 to 200.

Subcaudals 14, 41/41. Sometimes all subcaudals entire.

This snake is so well known that but a short description of it will be necessary. Body elongate and rounded; tail moderate, not distinct from trunk: head rather small, quadrangular with rounded muzzle; shields of crown regular; 2 nasals, no loreal; one anterior and 2 posterior oculars; scales smooth, imbricate, in 17 rows; anal bifid; first subcaudals entire, hinder ones two-rowed; in some individuals all the subcaudals are entire. Black above, each scale of the outer series, red at the base and black at the tip; ventral shields with black posterior margins; muzzle light brown; ventral plates from 180 to 200.

The Black Snake is, I believe, the most common of all our venomous snakes; it frequents low marshy places, is fond of water, dives and swims well, and subsists principally upon frogs,

lizards, insects, and the smaller mammalia, in particular the young of *Hydromys leucogaster*. On one occasion 16 young of this rat were taken out of a single Black Snake, so that the reptile must have plundered four rats' nests.

When irritated the Black Snake raises about two feet of its body off the ground, flattens out the neck like a Cobra, and then darts at its prey or enemy. The bite of this snake is highly venomous, killing good sized dogs or goats within an hour.

The number of young brought forth in March generally amounts to 15 or 20. During the winter the Black Snake retires into the ground.

I believe that the Black Snake is found in almost every part of Australia. On the Murray and farther north a Snake occurs which has generally been considered a variety of the Black Snake; it is identical with it in almost every particular except colour, being brown instead of black, and orange beneath. Whether this is really a distinct species or merely a variety is not quite certain. Dr. Günther has distinguished the brown variety, however, as *P. australis*, and I mention this as it is a belief with some people that the Brown Snake and the Black Snake are identical, and the coloration sexual. It is to be remembered that the Brown Snake of Sydney, (*Diemenia superciliosa*) is generically distinct from the Black Snake.

#### HOPLOCEPHALUS. *Cuv.*

*Hoplocephalus nigrescens.* Gthr.

Black-backed Hoplocephalus.

Scales in 15 rows.

Ventrals 173 to 176.

Anal entire.

Subcaudals 37.

Scales in 15 rows, 6 upper labials, the second of which is pointed above, the third truncated. Uniform bluish grey or purple black above; ventral shields whitish, blackish on the

sides. Description :—Body rather elongate, rounded ; tail somewhat short, not distinct from trunk ; head oblong, depressed, not distinct from neck ; eye small, pupil sub-elliptical. Rostral shield, very broad and low, and very obtuse superiorly ; anterior frontals moderate, broader than long, rounded in front ; posterior frontals rather large, five-sided, each with two hinder edges forming together a right angle ; vertical, six-sided, about as broad as long, with parallel outer edges, an obtuse angle in front, and a pointed one behind ; occipitals oblong, obtusely rounded behind ; superciliary moderate ; two posterior oculars, one anterior just reaching to the upper surface of the head ; the post frontal, nasal, anteorbital and second upper labial meet at a point and replace the loreals ; six upper labials : the first is very low, situated below the nasal, the third and fourth enter the orbit ; front series of temporals formed by two shields, one of which is in contact with the post orbitals. Chin-shields of nearly equal size, several scales between the hinder chin-shields and the first ventral ; the median line of the upper part of the tail is occupied by a series of hexagonal scales ; a series of small teeth behind the grooved front tooth.

The present species is subject to considerable variation of colours during the course of the year ; sometimes before changing its skin the back and head are of a leaden hue, and the ventral scales uniform whitish ; after the old skin has been cast off, the upper coat assumes a shining deep purple or bluish black ; the ventral scales are at this time rose-coloured, which hue is invariably lost in spirits. The ventral scales of many subjects examined I found clouded on the sides ; sometimes the greater part of the scales, in particular those near the vent, were blackish, and the subcaudals entirely so. I believe that this is the only snake of the genus *Hoplocephalus* in which the tongue is white.

The rocky neighbourhood of Middle Harbour (Port Jackson) is the locality where I first found this new species, but since then specimens have been obtained from Port Macquarie and the Clarence River, which do not differ in colour from those inhabiting the neighbourhood of Sydney ; it is highly probable that the geographical distribution of this species extends still farther to

the northward; but, owing to its nocturnal habits, collectors will experience great difficulty in capturing it.

During the cold season, from May to September, I have frequently found this Snake hybernating (if I may so express their dormant state) under loose flat stones, singly or in pairs, but never in company with other Ophidians; and more than once a dozen specimens were the result of a day's hunting.

It is very singular that no Snakes of this kind were ever met with between Sydney and Long-Bay, or towards the South-head, and I believe that they never frequented that district, otherwise the species would have been known long before this, as even White, in his Voyage to New South Wales, figures such rare Snakes as *Vermicella annulata*, and *Hoplocephalus variegatus*.

With regard to its habits, I may mention that it is strictly nocturnal, feeding on the smaller Batrachians, as *Pseudophryne australis*, and *Uperoleia marmorata*, specimens of which I have found in its stomach. It is rather sluggish in its disposition, and, though venomous, not dangerous to man or the larger animals.

The female produces about 20 young annually.

HOPLOGEPHALUS SIGNATUS. *Jan.*

Black-bellied Hoplocephalus.

Scales in 17 rows.

Ventrals 157.

Anal bifid.

Subcaudals 51.

Body short and rounded; tail short, distinct from trunk; head triangular, distinct from neck: above brownish olive, head much lighter coloured, with a white-edged dark streak from behind the eye to the back of the neck.

Description—head shields regular; vertical, six sided, with obtuse angle in front, and a sharp one behind; superciliaries rather large, nearly as long as the vertical occipitals; much forked behind, sometimes angular, but more generally rounded; nasal large, pierced by the nostril; one anterior, two posterior oculars; rostral high, with a groove along its lower edge; six

upper labials, third and fourth coming into the orbit; a white or yellowish-edged dark streak from behind the eye to the back of the head, no collar; eye moderate, pupil rather sub-elliptical; in young individuals the pupil appears always quite rounded; scales six-sided, much larger on the sides than upon the back; skin between the scales black.

Young specimens have the whitish streak behind the eye very distinct and often extended on the other side as far as the nostril; the apical half of the tail is either whitish or salmon-coloured below; in other respects they do not differ from the adult in colour, except that the whitish hue on the sides of the neck is less distinct. In the adult subject the head is often much paler than the other part of the body, which is either olive brown or brownish black above, and bluish black or bluish grey below; the fourth part of each ventral scale is clouded with grey on the sides, leaving a much darker band in the middle, which, approaching the neck, diminishes in size; the sides of the neck below and the chin shields being of a yellowish hue. Individuals occur occasionally, which are almost black above; others, particularly those about to shed their skin, appear pale brown above, and bluish grey below; in removing any of the ventral plates, the skin below is always jet black.

Habitat.—

The present species abounds in sandy or swampy localities near Sydney; the country between the City and Botany is much frequented by these snakes; they appear to be nocturnal, and are seldom observed during the day-time; they often prey upon each other, but generally upon the smaller Batrachians (*Cystignathus* and *Pseudophryne*) which I have frequently taken from their stomachs; various kinds of insects, small lizards, &c., are also devoured by them. The venom of this snake does not effect the larger vertebrated animals. I have at various times experimented upon cats and goats with it, but without a single fatal result; in fact the animals bitten did not appear to be affected at all.

Mrs. Edw. Forde of Ash Island, to whom I am greatly indebted for much valuable information respecting the reptilian fauna of the Hunter River, informs me that *Hoplocephalus*

*signatus* is the most common of the Snakes on Ash Island, and that it is frequently captured and carried about by domestic cats, generally at night, proving at once its nocturnal habits and the slight effect its venom has upon these animals.

At Port Macquarie, this Snake occurs in large numbers, also at the Richmond and Clarence Rivers, but from beyond Brisbane I have never seen any specimens. I believe that it is also found in the neighbourhood of Melbourne. It is probably identical with *Hoplocephalus flagellum* (M'Coy).

The female produces from 15 to 25 young ones annually, total length 20 inches, tail 4 inches, cleft of mouth  $\frac{5}{8}$  of inch.

HOPLOCEPHALUS VARIEGATUS. *D. and B.*

Broad-Headed Snake.

Scales in 21 rows.

Anal entire.

Ventrals 210.

Subcaudals 45 to 50.

Body and tail moderate ; head flat, broad behind, very distinct from neck, obtuse in front ; eye moderate, pupil sub-elliptical ; vertical shield rather small, six sided, frontals of nearly equal size, large posterior ones rounded behind ; occipitals regular, rather broad, forked ; large lower temporal shield wedged between fifth and sixth lower labial ; 6 lower labials, the last of which is the largest ; one large pre-ocular in conjunction with nasal ; anterior, frontal and second upper labial replacing the loreal.

Above black, irregularly spotted with yellow (white in spirits), forming a series of broad black blotches upon the back.

Beneath shining greyish black, each ventral plate with a large yellow spot on each side ; first and second row of scales yellow, with here and there a black one intermixed ; all the light scales more or less shaded towards the point.

We know little or nothing as regards the geographical distribution of this reptile ; the few specimens in European collections were obtained by Mons. Verreaux, near Sydney, and so rare has this snake always been that up to 1858 no specimen of

it was to be found in the British Museum. Since then I have been able to collect several hundreds of these snakes, which are strictly nocturnal in their habits, and seldom if ever observed during the day time. They may be procured from under stones in sunny localities during the cold season, and all the stony ridges around Sydney have harboured them in large numbers. At the present time they begin to become scarce, many of their favourite haunts being invaded by the gardener or the builder.

The bite of this snake is not sufficiently strong to endanger the life of man. I have been wounded by it several times, and experienced no bad symptoms beyond a slight headache; the spot where the fang entered turning blue to about the size of a shilling, for a few days.

Cats, dogs, and goats have been frequently experimented upon without any fatal result.

In January or February the female produces from 15 to 20 young ones, which, though only a few inches long, will show fight if one attempts to lift them; the adults always look formidable if attacked.

The snake which Schlegel describes as *Naja bungaroides* *Abbildungen*, Tab. 48, fig. 17 and 18, is nothing but a variety of the present species. The Australian Museum is in possession of a specimen from the Hastings, which is banded instead of having the irregular blotches of *H. variegatus*.

#### HOPLOCEPHALUS CURTUS. *Schleg.*

##### The Brown-banded Snake.

Scales in 18 rows anteriorly, and in 19 posteriorly.

Ventrals 169.

Subcaudals 44.

Body rounded, rather depressed, tail moderate, not distinct from trunk; head large, broad, very distinct from neck, crown flat, muzzle rounded; superciliaries slightly prominent, and sometimes two grooves before the eye. All the shields of the head very broad, the vertical almost square, with an obtuse angle behind; occipitals deeply forked, sides sometimes jagged, with a

broad scale fitting the notch. Scales never in less than 18 rows; above olive brown with from 60 to 70 darker cross-bands, in some specimens the scales between the dark bands are anteriorly edged with yellow, the two outer rows of scales yellowish, more or less clouded, but without any distinct spot in the centre of each scale as in *H. superbus*. Belly yellow, ventral plates frequently clouded or spotted with dark grey anteriorly, growing darker towards the tail; the subcaudals, which are entire, being almost uniform blackish.

The coloration of this snake varies considerably; on the East Coast light-brown specimens are much more frequent than dark ones, whilst Western Australian snakes of this species are very dark-brown, and the cross-bands remarkably distinct. This reptile has been frequently alluded to by some authors as *H. superbus*, but I have always maintained that no continental species has ever been found with 15 rows of scales, and the vertical shield more than twice as long as broad; the main characters by which the two snakes can easily be distinguished. I am certain that more than 300 specimens have passed through my hands, and in not one instance did they answer to Dr. Günther's description of *H. superbus*.

I will give here the main points in which both Snakes differ:

*H. superbus.*  
*Scales* in 15 rows.  
*Tail* short, distinct from trunk.  
*Head* remarkably small, scarcely distinct from trunk.  
*Neck* rather rounded.  
*Scales of Head* more or less elongate; vertical, more than twice as long as broad.  
*Coloration* uniform brown, 2 outer rows of scales with reddish or yellow centre spot.  
*Habitat* Tasmania.  
*Synonym* Diamond Snake of the Tasmanians.

*H. curtus.*  
*Scales* in 18 to 19 rows.  
*Tail* not distinct from trunk.  
*Head* very broad, as large again as *H. Superbus*, and distinct from neck.  
*Neck* very flat.  
*Scales of Head* very broad, in particular the vertical, which without the anterior angle would form a square.  
*Coloration* brown banded, 2 outer rows of scales paler, or clouded with yellow and greyish.  
*Habitat* Australian continent.  
*Synonyms* Brown Banded Snake, N. S. Wales; Tiger Snake, Victoria.

I have had some correspondence with Dr. Albert Günther regarding the habitat of the two Snakes, and I am glad to see the learned Doctor's statement in the *Annals of Natural History* for November, 1863, that "*Hoplocephalus superbus* proves to be a Tasmanian species."

It would be interesting to know whether the Tasmanian Snake is able to inflate the skin of the neck when irritated, but judging from its small size this is not likely to be the case, and we must leave to Tasmanian Naturalists the solution of this question. In the continental Snake the power to raise itself off the ground for half the length of the body, and to flatten out the neck like a Cobra, is well known, the Black Snake being the only other reptile which has been provided with the same power. A few words more and I have done with this, the most dangerous of all our Snakes.

Its habitat is, I believe, the temperate part of Australia from East to West. I have taken it on the Murray, in South Australia and Victoria, and received specimens from almost every part of New South Wales and from King George's Sound. The present species is not far removed from the Indian Cobra (*Naja tripudians*), and its bite is as deadly. A good sized dog bitten became paralyzed within three minutes, and was dead in fifty minutes afterwards; a goat died in thirty-five minutes; another goat which escaped whilst experimented upon, was found dead in the street after a few hours; a Dingo met the same fate in forty-eight minutes; an Echidna (*Echidna hystrix*) lived six hours, and a Common Tortoise, an animal which will live a day with its head cut off, was dead in five hours after being bitten.

Antidote vendors seeing the effect of the poison, never dared to peril their reputation in the attempt to save the animals so bitten; I must mention, however, that in making these experiments, chance bites, where the snake makes a dart, bites, and retires, were out of the question, and I grant that under such conditions man or animal may recover; but if the snake's head is applied to the lip or ear of some animal and the fangs well pressed into the wound, there is little hope of recovery. Let me also give a few words of advice to such men as go about exhibiting these reptiles, and showing their prowess by allowing themselves to be

bitten, professing that they possess an antidote against the poison; generally speaking, these persons are more or less impostors; they break off the fangs of the snake, but do not know how soon they are reproduced, and thus frequently fall victims to their ignorance. The Indian jugglers have more sense, and entirely remove the teeth, as most of the specimens of *Naja tripudians* prove which are received from India.

The young of this snake, from 15 to 20 in number, are generally observed about the end of February; they are then from 7 to 8 inches long, and subsist on small frogs, lizards, or insects. During the cold season this snake retires into the ground, as I have never met with half-grown or adult specimens under stones.

PETRODYMON. *Kreffl.*

PETRODYMON CUCULLATUS.

Red-bellied Snake.

Scales in 15 rows.

Anal 1/1.

Ventrals 187.

Subcaudals 41/41.

Purplish brown above, with a series of darker longitudinal lines along the upper part of the body, leaving a light elongate mark in the middle of each scale. Beneath yellow, bright red in adult specimens, each ventral plate clouded on the upper edge with purplish brown, much interrupted on the posterior part of the body. Divisional line of subcaudal plates marked in a similar manner, leaving the outer edges of the plates yellowish. Upper part of head purplish brown as far as the middle of posterior frontals, covering the vertical part of superciliaries, and reaching beyond the occipitals; this elliptical spot is joined to the back by a narrow band of the same colour running along the median line of the neck. A light-greyish band encircles the dark-brown mark, divided by the narrow line by which this mark is joined to the back. Upper and lower labials dotted with brown spots. Body rounded, head rather flat, depressed; tail

short, distinct from trunk, and ending in a conical spine or nail about a quarter of an inch long.

Scales in 15 rows (not in 13, as mentioned by Dr. Günther, whose description as *Diemenia cucullata* was taken from a very bad specimen); 6 upper labials, the third and fourth forming the lower edge of the orbit, the second labial *not* in contact with the posterior frontal; rostral broad, low, very obtuse superiorly; shields of the head regular, all more or less rounded posteriorly, and slightly imbricate, vertical twice as long as broad; one anterior and two posterior oculars, one temporal in contact with both oculars, four or five scale-like temporals behind; eye very small, pupil elliptical and erect.

About 3 years ago—in 1860—I captured a single individual of this species; since then, owing to the exertions of friends in the country, specimens from Ash Island, Hunter River, Port Macquarie, the Clarence River, and other localities have been received, so that its geographical range has been ascertained for many hundred miles along the east coast. This snake is strictly nocturnal in its habits, sluggish and of gentle disposition, never offering to bite when handled, and though venomous, it is so in a very slight degree only, as has been proved by experiments; its length seldom, if ever, exceeds 20 inches. Rocky and desolate places are frequented by it, and in such localities it is occasionally found under flat stones during the cold season.

VERMICELLA. *Gray.*

VERMICELLA ANNULATA

The Ringed Vermicella.

Scales in 15 rows.

Ventrals 225.

Anal bifid.

Subcaudals 18/18.

The following is Dr. Günther's description:—"Body elongate, rounded, slightly compressed behind; tail very short; head

moderate, not distinct from neck, similar to *Elaps*; rostral shield very large, rounded, raised above the surface of snout; occipitals rather narrow; two posterior oculars; anterior large, replacing the loreal together with the nasal; nasal shield single, pierced in the centre by the small nostril; six upper labials, third and fourth coming into the orbit; one large temporal shield in contact with the upper posterior ocular, two smaller ones behind. Scales smooth, large, rather rounded behind, in fifteen rows. Anal and subcaudals bifid. Tail ending in an obtuse conical scale. Two small fangs in front of upper jaw, no other teeth behind; palatine and mandibular teeth equal in length. Crown of head and muzzle black; a yellowish, in fresh specimens white, band across the posterior frontals, a second on the neck; body and tail encircled by alternate black and white (in spirits) rings. Length of cleft of mouth  $\frac{1}{2}$ " ; length of tail  $1\frac{1}{2}$ " ; total length 28."

The ringed *Vermicella*, like all other nocturnal snakes, is very seldom met with, and apparently little known to the colonists. I often capture it during the cold season without taking any precaution whatever, as I know from experience that this gentle creature will never bite; but even if it should do so, the wound would be small and of no danger whatever. I have never succeeded to make it bite of its own accord, but had to open its mouth forcibly if I wished to try an experiment. White, in his Voyage to New South Wales, gives a figure of this interesting snake, but little was known until a few years ago with respect to its geographical range. We find it as far south as Eden, Twofold Bay; it occurs again in Western Australia, is tolerably common near Brisbane, and may probably be found much further north. Mr. William Taylor has lately presented a young specimen of this snake to the Museum, which was captured at the Culgoa River; it is not unlikely that this species is found all over the continent from east to west.

In its habits it is nocturnal, and closely allied to the genus *Elaps*, inhabiting South America; in fact it bears, like our *Batrachians*, according to Günther, a closer resemblance to the South American than to the Indian fauna.

ACANTHOPHIS. *Daud.*ACANTHOPHIS ANTARTICA. *Wagl.*

The Death Adder.

Scales in 21 rows.

Ventrals 127.

Anal entire.

Subcaudals 42.

Head large, depressed, broad behind, regularly shielded, no loreal, 2 nasals, nostrils between; 8 rows of dorsal scales, keeled to the root of the tail; grey, sometimes salmon coloured above, minutely punctulated; back and tail with about 4 or 5 white spots speckled with pink, lower lip flesh coloured (white or yellowish white in spirits), with a pale black dot in the centre of each scale; beneath salmon coloured (yellow in spirits); tail distinct from trunk, short, thin, and ending in a recurved soft spine.

The colour of the Death Adder is subject to a good deal of variation, northern specimens from Rockhampton and Port Denison have the dark cross-bands of the back considerably smaller than those from the neighbourhood of Sydney, and the markings in the centre of the upper and lower labials and chin shields are of a pale greyish hue in the former. Specimens of a copper-red colour, as occasionally occur near Richmond, Randwick, and Long Bay, have seldom come under my notice from other parts of the continent.

Its habits and economy are tolerably well known. It is fond of warmth and sunshine, frequents sandy localities, is sluggish in its movements, and does not jump backwards if going to bite. When irritated this snake flattens itself out generally in the form of an S, turning round to one side or the other with astonishing rapidity, but never *jumping* at its enemy. As regards the supposed venomous sting in the tail, I can assure everybody interested in this matter that the caudal appendage is a mere ornament, quite soft, which nobody could run into his finger if he tried, and I am astonished that the fables which ignorance has circulated in a former and darker age, have not been exposed long before this.

In April or May they go into winter quarters, having during the summer months accumulated a sufficient quantity of fat, to

be under no further necessity of catching frogs, grasshoppers, or field-mice during the next season. The burrow of some small rodent, or the hole furnished by a decayed root, is selected and taken possession of until the warm sunshine of spring recalls the sluggish reptile to fresh activity.

I believe that the Death-adder is found in almost every part of Australia north of 36°. The Australian Museum is in possession of specimens from many parts of New South Wales and from various localities in Queensland. The British Museum received this snake from Port Essington and the north-west coast, and I have taken it myself on the Murray and Darling. Its length seldom exceeds 30 inches. A very large specimen measured 2 feet 2½ inches to the vent, and 4¼ inches to the tail; total, 2 feet 7 inches; around the body, 6 inches.

## 2. HYDROPHIDÆ, OR SEA SNAKES.

PLATURUS. *Latr.*

PLATURUS SCUTATUS. *Laur.*

The Ringed Sea Snake.

Scales (front part) 21 to 23 series.

Ventrals from 213 to 241.

Body subcylindrical, of moderate length, shields of the head subnormal in number and arrangement, nostrils lateral, in a single nasal shield, both nasals being separated from each other by a pair of anterior frontals. Scales imbricate, smooth, ventral shields well developed, tail with 2 series of subcaudals (Gthr.)

Body covered with a series of black rings, 20 to 50; crown of the head black, the first and second black mark of the head and neck are joined below by a longitudinal band commencing from the chin; snout and side of the head yellow, with a black band running through the eye (Gthr).

This Snake is frequently thrown ashore after stormy weather near Manly Beach, Coogee Bay, Botany, and other localities. Its range is very extensive, and it is common in the Bay of Bengal, the China Seas, and on the Australian and New Zealand coast; it lives on fishes, and is not much dreaded by the natives of the South Sea Islands who, I am told, handle this snake with impunity.

PELAMIS. *Daud.**Pelamis bicolor.* *Daud.*

## The Black and Yellow Sea Snake.

“Head long, with very long spatulate snout; neck, rather stout; body of moderate length; nasal shields contiguous, longer than broad, pierced by the nostrils posteriorly; only one pair of frontals; scales not imbricate, not polished, tubercular or concave; ventral shields none or very narrow; lower jaw without notch in front; 2 or 3 postorbitals; neck surrounded by from 45 to 51 longitudinal series of scales: from 378 to 440 scales in a lateral longitudinal series between the angle of the mouth and the vent.” (Günther.) The coloration of this snake varies considerably; the most prevailing colour is, the upper part of the head and the back uniform black, the sides and belly uniform brownish olive or yellow, the latter colour predominating just after the snake has shed its skin. Both the black and yellow colours are sharply defined. Tail with a series of black spots. This snake, which occasionally occurs on our shores, has a wide range, and appears to be as common on the Indian Ocean as it is here. The coast of New Zealand may be taken as its most southern limit. Dr. Gray, speaking about the Hydridæ in the *Brit. Mus. Cat. of Snakes*, remarks “that they are true Sea-Snakes; that they coil themselves up on the shore, living on sea-weeds, and lay their eggs on the shore.” This observation is not correct if applied to the present species, as I have more than once taken gravid females with from four to six well-developed young of such a size as are sometimes met with swimming about, and apparently a few days old only. That they live on sea-weed is doubtful also, for though I have dissected almost every specimen which has come into my hands, I have found nothing but fishes or the remnants of such in the stomach.

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These are all the specimens of Snakes observed near Sydney; and as the country has been well searched for more than five years, it will be difficult to discover new species.















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