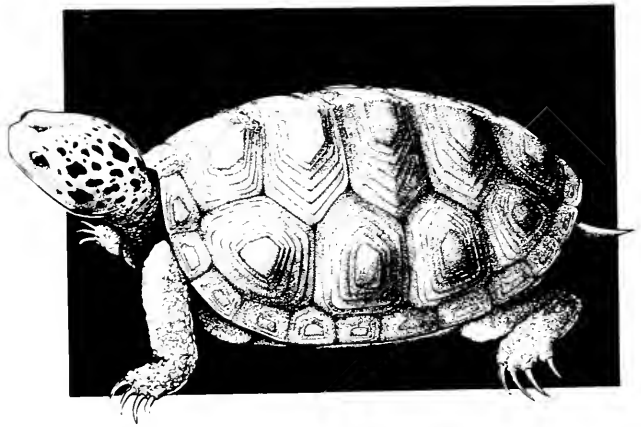
The Snakes of Ceylon.

By
A. F. ABERCROMBY.



Arthur Loveridge.

Kilternan,
Llandaff

THE SNAKES OF CEYLON.

THE SNAKES OF CEYLON

By

A. F. Abercromby.

London:
MURRAY & CO., 180 Brompton Road, S.W.
1910.

INDEX.

PREFACE.

As far as I am aware no book has as yet been written upon the "Snakes of Ceylon," though accounts of the latter are usually included in the many works and treatises on the Ophidia of India.

These works, however, are, as a rule, too technical for the general reader, and are more suited to the scientist than the naturalist. Natural History books, on the other hand, seldom give sufficiently detailed information about the Snakes, and only touch lightly on this interesting branch of Natural History. I have, however, attempted to supply this omission by describing the subject in nearly all of its most interesting aspects, and feeble though the attempt is, I trust that the Scientist, Naturalist, Sportsman, and Taxidermist may each find something to interest him in this small volume, compiled from information gleaned while keeping and studying Snakes in Ceylon.

In compiling this book I have obtained much valuable information from the following well-known works:—

"The Fauna of British India—Reptilia and Batrachia," M. G. A. Boulenger.

"The Poisonous Terrestrial Snakes of our British India Dominions," Major F. Wall.

"Nicholson's Indian Snakes," Mr. E. Nicholson.

Chapter I.

PREJUDICE AGAINST SNAKES.

There is a lot of undue prejudice and dislike with regard to Snakes. It is true that the poisonous varieties should be feared, but it is not merely fear of these, that creates the dislike prevalent against the whole of the Serpent race. It is Prejudice. People who have studied and written books on these reptiles have nothing detrimental to say against them. An attack by a lion or a tiger is just as apt to terminate fatally as the bite of a cobra, but the former are not regarded with the same horror, with which people think of serpents. This prejudice is due mostly to ignorance. It is human nature to fear what we cannot understand.

Reasons for a dislike of Snakes.

When you see a snake moving, without any visible means of propulsion, you fear it, as it appears uncanny.

When you see the fixed stare of a snake (due to the absence of eyelids), you attribute it to hypnotic powers, and fear it more than ever. That snakes actually exert hypnotic power to attract their prey is a fallacy. A frog or rat coming suddenly upon a snake, may become partially paralysed through fear, thinking that the snake is looking at it, although at the time the serpent may be asleep, but is unable to close its eyes owing to the absence of eyelids. A frog or a lizard will often, under the circumstances keep still, in a seemingly paralysed condition, hoping that its protective coloration will enable it to avoid observation.

The much maligned snake is often referred to by people, who have never handled or studied one, as "an ugly slimy thing." A snake on the contrary is dry skinned, and is one of the most beautiful

works of Creation. You never find a snake with unsightly angles and corners (though the heads of a few snakes are repulsive). The movements of the snake are silent and graceful, they make no disturbing noise, and do not fight and quarrel with each other, which is more than can be said of the Human race. In fact, the malicious nature so often attributed to snakes is entirely non-existent. Another reason for the fear occasioned by snakes (mostly noticeable, by the way, in those who have seldom, if ever, seen a snake) is the extremely "tall" romances that are related sometimes by people who have been out in the East, and wish on their return to thrill their hearers with highly-exaggerated stories. Some time ago, when reading over a rather old number of a magazine, I came across such a story.

The Author starts by entering his billiard room one morning and finds twenty-seven snakes in it, which he kills. He then goes for a walk in his garden, to repair his shattered nerves, and is chased round and round a hayrick by a cobra. When this has gone on for half an hour, the cobra leaves him, and he retires to bed (and about time too!), and in doing so steps on a deadly viper. The Author ends by stating that he is a teetotaler, and I can quite understand why. It is stories such as this that intimidate possible visitors to the East, and make them expect to find cobras regularly "with their morning tea."

The following is taken from a book on Ceylon, recently published. Referring to a journey between Polgahawela and Mihintale, the Authoress mentions that "that peculiar hiss heralded the approach of a cobra, who, with head erect, would gaze at the travellers." Again, "Amidst the cracking and roar" (of the flames) "the hiss hiss of the cobra was distinctly *visible*, besides the muffled moan of

the boa-constrictor in flight for life," and further on, referring to the cobra, "It sneaked along the floor spitting out virus in all directions."

No wonder that the snake has such a bad name!

The stories that one so often hears of pursuit by snakes are easily explained.

A snake, when disturbed, will not always retreat in the opposite direction to which it is approached, but will make a bee line for its hole, or the nearest jungle.

If it is on a hillside it will be almost certain to go down-hill when disturbed by anyone.

If a person is going along a path, a snake will sometimes cross the road in front of him, and probably follow the man if his line of retreat lies down-hill, or in the same direction as the snake's hole is. Hence the fanciful idea of pursuit by a snake.

If snakes could talk they would probably tell as alarming stories about mankind, as man does of snakes.

Only when cornered or injured will a snake attack, and then, if left alone, will always retreat.

All snakes have an instinctive fear of human beings, and even members of the Python family (the Giant Anaconda, for instance) will always retreat if they get sufficient warning of his approach. The rare cases in which people have been seized and crushed by boa-constrictors, etc., are probably due to the snakes mistaking them for deer or other game, the sight of the different species of the Pythoninae being very bad in the daytime. In fact, a nocturnal snake that is having a meal in the daylight will sometimes seize and bite its own body in mistake for the dead body of its prey.

Chapter II.

SUITABILITY OF CEYLON FOR THE STUDY OF OPHIOLOGY.

Ceylon is an ideal country for the study of Snakes. There are many Eastern countries containing more snakes, and more varieties, but in few other countries are there so many varieties to be found in so small an area.

This is chiefly due to the geographical conditions prevalent in Ceylon, where so many different formations of country are to be met with, and so many different temperatures and climates. There are the mountains beloved of the earth-snakes, the swamplands, where the pythons and water snakes abound; the jungle bounded paddy fields, where the cobras, rat-snakes, and other varieties indulge in their evening frog hunting; the Patana covered downs of Uva, giving cover to snakes of all descriptions, which are seldom seen except when the grass is being burnt down; and the sandy Jaffna district, the home of the Russell's Viper, the Bungarus Caeruleus and the Echis Carinata.

Representation of genera in Ceylon.

Although many genera are represented in Ceylon, the number of representatives to be found of each genus is comparatively small. Thus the large family of Bungarums (or Kraits), eleven in number, have only two representatives in Ceylon, the Bungarus Ceylonicus and the Bungarus Caeruleus, the latter being very rare and only found in Jaffna. The large family of the Trimeresuri is only represented by the T. Trigonocephalus. Lycodon Aulicus and L. Carinatus are the only specimens of the Lycodontidae to be found in Ceylon, and the Tropidonoti are only found in the forms

Quincunciatus (Piscator*), Stolatus, Ceylonensis and Plumbicolor.

On the other hand, there are many species of Earth-snake peculiar to Ceylon. These snakes are very numerous in the mountain districts, and probably many varieties have still to be recorded.

The Gongylophis Conicus has not as yet been found in Ceylon, though its existence in the northern portion of the island is quite probable. The Echis Carinata is to be found in the north, though it is very rare.

List of Snakes found in Ceylon.

I. *Typhlopidae.*

1 Typhlops[1] Mirus
2 ,, Braminus

II. *Boidae.*

3 Python[2] Molurus

III. *Ilysiidae.*

4 Cylindrophis[3] Maculatus

IV. *Uropeltidae.*

5 Uropeltis[4] Grandis
6 Rhinophis[5] Oxyrhynchus
7 ,, Punctatus
8 ,, Planiceps
9 ,, Blythii
10 Silybura[6] Melanogaster

V. *Colubridae.*

(Aglypha) *Sub-Family Colubrinae.*

11 Aspidura[7] Brachyorrhos

---

*The Ceylon variety of this snake is now known as Tropidonotus Asperrimus.

12 Aspidura Copii
13 ,, Guentheri
14 ,, Trachyprocta
15 ,, Drummondhayi

[8]
16 Haplocercus Ceylonensis

[9]
17 Lycodon Aulicus
18 ,, Striatus
19 ,, Carinatus

[10]
20 Hydrophobus Nympha
21 ,, Gracilis

[11]
22 Polyodontophis Subpunctatus.

[12]
23 Ablabes Calamaria

[13]
24 Simotes Arnensis

[14]
25 Oligodon Templetonii
26 ,, Sublineatus
27 ,, Subgriseus
28 ,, Ellioti

[15]
29 Zamenis Mucosus
30 ,, Fasciolatus

[16]
31 Coluber Helena

[17]
32 Dendrophis Pictus
33 ,, Bifrenalis
34 ,, Caudolineolatus

[18]
35 Tropidonotus Ceylonensis
36 ,, Plumbicolor
37 ,, Piscator*
38 ,. Stolatus

[19]
39 Helicops Schistosus

---

* Known as Asperrimus in Ceylon.

(Opisthoglypha) *Sub-Family Dipsadinae.*

40 Dipsas[20] Barnesii
41 ,, Ceylonensis
42 ,, Forstenii

43 Dryophis[21] Mycterizans
44 ,, Pulverulentus

45 Chrysopelea[22] Ornata

(Opisthoglypha) *Sub-Family Homalopsinae.*

46 Cerberus[23] Rhynchops

47 Hypsirhina[24] Enhydris

(Proteroglypha) *Sub-Family Elapinae*

48 Callophis[25] Trimaculatus

49 Bungarus[26] Ceylonicus
50 ,, Caeruleus

51 Naia[27] Tripudians

VI. *Viperidae.*

Sub-Family Viperinae.

52 Vipera[28] Russellii

53 Echis[29] Carinata

Sub-Family Crotalinae.

54 Ancistrodon[30] Hypnale

55 Trimeresurus[31] Trigonocephalus

There are three snakes I have omitted to enumerate, as their existence in Ceylon is doubtful; Gerardia Prevostiana, Ancistrodon Millardi, Trimeresurus Gramineus.

Gerardia Prevostiana was accidentally recorded from Ceylon, and its presence there denied by Prof. Boulenger.

Ancistrodon Millardi is mentioned by Major Wall as being a second variety of Ancistrodon Hypnale.

The existence of Trimeresurus Gramineus in Ceylon is doubtful.

The Poisonous, Suspected, and Harmless Snakes.

Exclusive of these there are 55 snakes in Ceylon and 31 genera are represented. The Aglypha, Colubrinae and Achcrochordinae (the latter not represented in Ceylon) are harmless. The Opisthoglypha, Dipsadinae and Homalopsinae are slightly poisonous (back-fanged), and the Proteroglypha, Elapinae and Hydrophiinae (the latter are omitted from the list, being Sea-snakes) are poisonous (front-fanged). All the Viperidae are poisonous. The remaining Families are harmless.

Chapter III.

SNAKES IN GENERAL AND THEIR ANATOMY.

Snakes may be distinguished from lizards, earth and blind worms, by means of the following short definition :—

Definition of Snakes

(*a*) Elongate body, with a scale-covered epidermis, cast several times during the year.

(*b*) No eyelids, the eyes being covered by hard and transparent shields, which form part of, and are cast with, the epidermis.

(*c*) No limbs, though vestiges of hind legs are to be found in certain earth-snakes, the Python, and the male Gongylophis.

(*d*) Absence of visible ears.

(*e*) The connection of the jawbones by muscles and ligaments, and the expansion thereby obtained owing to the absence of natural joints.

(*f*) The presence of teeth on the palate (in most snakes) in addition to those in the jaws.

Means of Locomotion.

The snake moves by means of ventrals, or oblong shields on the underside of the body, their ends being connected by muscles with the ends of the ribs. By moving forward one pair of ribs after the other, the edges of the ventrals catch and press against the ground, in much the same manner as the paddles of a steamboat press upon the water, except that the paddles are perpendicular to the surface of the water, whereas the snake's ventrals lie almost flat along the ground. In this manner the snake is propelled forward.

The Tail and its Uses.

The tail plays no part in the locomotion of the snake, but helps to steer its body, and is useful as a prehensile organ in the case of Tree-Snakes.

When moving fast the snake lashes itself along the ground in a succession of curves. This enables it to take a hold of the ground with the outer portions of the ventrals, which, gripping the ground better than the central portions, enable the snake to move faster. The tail again comes in useful in assisting the lateral undulations of the snake.

It is noticeable that in certain fast-moving snakes, such as Zamenis, Dendrophis, and Dryophis (the Rat-snake, Copper Tree-snake, and Whip-snake), the tail is long in comparison with the length of the body, while in slow-moving snakes, such as the families Uropeltidæ, Boidæ, and Viperidæ, the tail is short.

Certain snakes, the Dipsadinæ and the Trimeresuri, vibrate their tales when irritated. This is in some way explainable in the Trimeresuri, as they belong to the same sub-family (Crotalinæ) as the Rattlesnake, but this does not explain the habit in the Dipsadinae. This peculiarity is also noticeable in other snakes, mostly Tree-snakes, but in not nearly so marked a degree.

Shape of Body and Lateral Keels

Snakes may have cylindrical or compressed bodies. The former are most noticeable among Earth-snakes (Uropeltidæ, Xenopeltidæ, etc.) and the latter among Tree-snakes (Dipsadinæ). Among certain Tree-snakes lateral keels are to be found; that is, they have their outer rows of scales very much enlarged, and as broad as the ventrals. This is especially noticeable in the different varieties of Dendrophis.

The Heads and Head-Shields

The heads of snakes vary very considerably, and, together with the shields on them, form the most important factor in the identification of snakes.

The shields on the heads of the various genera of Colubridæ are regular in pattern, and identification of the different species can only be done by minute comparisons of the comparative sizes of the different shields in relation to one another. The shapes of the heads in this large family are very variable, some being spade-shaped, some elongate, some oval, a few rounded, some triangularly elongate, and some pointed.

A rough classification of the shapes of the heads and head-shielding found in the different families.

The Amblycephalidæ have enlarged but regular shields, such as those found on the Colubridæ, and their heads are club-shaped. The snakes of the family Viperidæ have mostly triangular heads, with the exception of the Azemiops Feae and Echis Carinata, which have round heads, and the Crotalinae, which have pear-shaped heads. Some of the vipers have their heads covered with scales, some have regular shields on their heads, and others have partly-shielded and partly-scaled heads. The heads of the Boidae vary considerably, the shielding of the Pythons being unique in its pattern, while Gongylophis and Eryx have heads covered with scales.

The Uropeltidae and Ilysiide have differently-shaped shields to those of the Colubridae, the shields being enlarged and straight-sided, while a few shields that are present in the Colubridae are missing in the Earth-snakes. The shielding on the Xenopeltidae is really a mixture of the types found on the two above-mentioned families and that on the Colubridae.

The shields found on the Glauconidae and Typhlopidae are peculiar, and resemble the shielding of no other family. Their heads are of a type peculiar to themselves, while the heads of Uropetidae, Ilysiidae, Xenopeltidae, and Boidae resemble in shape those found among the Colubridae.

Colouration.

The Colouration of snakes is of three kinds :

(1) The natural colour of the scales.

(2) Colour formed by pigments under the skin.

(3) Colour on the skin between the scales.

Most dull-coloured snakes, such as the Cobra and Rat-snake, belong to the first class.

The second form of colouration is found mostly in Tree and brightly coloured snakes, often together with the third form of skin colouration between the scales.

It is the colouration by pigments that is responsible for the colour change which sometimes occurs in certain snakes. The skins of snakes coloured in this way lose their colour after the snake has been killed and the skin removed.

Colour changes occuring after death in the Dendrophis Pictus.

Take, for example, the Dendrophis Pictus. The colours found on this snake when alive are very numerous, and comprise blue, green, brown, olive, and yellow.

After death the pigment (or optical) colours disappear, leaving the scale colouring, brown and olive, and the sky blue colour found on the interstitial skin. These fade, and the ground colour, when the skin is dry, is dark blue, fading into light blue near the ventrals, though, when held to the light the part originally coloured by pigment is found to be transparent, and is crossed by dark streaks, which are what remains of the colour on the interstitial skin.

Surface Colouration.

Scale colouration is not always uniform, but certain scales may be of a contrasting colour, and form a pattern. The depth of the colour in a snake's skin may be judged by the fact that the cast epidermis of a snake is colourless, though in the case of the Python dark marking may be faintly seen on its cast skin.

The Internal Organs.

Cutting a snake open, from the head down to the anal, one first notices, in the snake's mouth, two tubular sheaths, the foremost containing the tongue, and the one behind being the termination of the windpipe. The flexibility of the windpipe is demonstrated when a snake is swallowing anything at all large.

Protrusion of the Windpipe.

When the animal or bird being devoured is about half way into the snake's mouth, the snake will project its windpipe beyond the lower lip, in much the same manner as a tongue is protruded, where it opens and closes, taking in air—in this way a snake avoids suffocation, when both the mouth and the interior orifices of the nasal passage are blocked by the food. A ten-foot python can protrude its windpipe a good half-inch beyond the lower lip.

About quarter of the way down the body are Lungs, or rather lung, as only the left one is properly developed. It is formed of a network of air cells, and only the anterior portion is used for breathing, the posterior being an air reservoir. The Hydrophiinæ (Sea-snakes) naturally have very well developed lungs. The Heart is in front of the anterior portion of the lungs, while at the posterior end comes the Liver, a large elongate organ, which extends down to behind the stomach. At the lower end of the stomach, where digestion principally takes place, come the Gall-bladder and Pancreas. Below these latter are large masses of fat, which form a reserve supply of nourishment for the snake when it is fasting. The stomach cannot of course contain the large amount of food swallowed, but as digestion takes place, the lower portion of the animal swallowed passes into the Intestines (situated below the Pancreas), and the remainder of the food passes from the gullet into the stomach. The fat surrounding the stomach

Digestion.

helps to lubricate the system, and plays an important part in assisting the liver and other organs in their work of digestion. The Ovaries lie in front of the intestine, and resemble transparent sacks, which sometimes extend nearly half way up the body of the snake.

The Five Forms of Dentition.

The Dentition of Snakes is of five kinds:—

(1) Solid teeth (all harmless snakes).

(2) Grooved and immovable fangs, situated in the back of the upper jaws, behind the solid maxillary teeth, and which may be provided with a slight amount of poison (Dipsadinæ, Homalopsinæ).

(3) Fangs grooved and immovable, situated in front of the other maxillary teeth and supplied with virulent poison (Hydropiinæ).

(4) Poison fangs in a better stage of development, supplied with virulent poison, and situated in front of the other maxillary teeth, with well-marked poison canals down their centres. These fangs can be slightly erected and depressed (Elapidæ of India and Ceylon).

(5) The whole poison apparatus in its best stage of development. Fangs much enlarged, caniculate, and capable of being entirely erected and depressed (Viperidæ).

Mobility of the fang.

The erection and depression of the fang is found in its most perfect form among the Viperidæ, and is accomplished in the following manner:—

The maxillary bone is a bone situated behind and below the snout, where it moves in a socket formed by the "snout bones" (præ-frontal). Welded to the lower end of the maxillary bone is the fang, while the centre of the maxillary bone is itself hinged on to another bone (the ectopterigoid), which can be protruded and retracted by muscles, thus raising and depressing the fang.

Bones of the skull and jaws.

These muscles also move the palatine bones, which are the inner branches of what are known as the pterygoids, the maxillaries forming, in the harmless snakes, the outer branches.

All snakes bear teeth on the palate, except Oligodon and a few varieties of Earthsnakes.

A snake's mouth is capable of great expansion, the lower jawbones being joined to each other at the anterior (chin) end by muscles and skin, while at the posterior end they are loosely connected with the skull by quadrates, long-hinged bones which enable the mandibles to be protruded to a great extent. The lower end of the quadrates also hinge with the pterygoids, which themselves branch out into four branches, the two inner ones being the palatine bones, and the outer ones the "maxillaries."

The shedding and replacing of the fangs.

The poison fangs of a snake are shed frequently during its life (very often about the skin-shedding period). As the fangs loosen, the teeth behind, which by this time have reached almost their full growth, move forward and are used in place of the original fangs, replacing the latter when they fall out. If a snake is killed at this period and a maxillary bone removed it will be found that the front fang can be easily extracted from the bone with the fingers, but that the hinder fang will be firmly welded on. In some snakes, usually old ones, I have counted as many as three fully developed fangs on each side, the front ones being loose and the back one firm.

Teeth of every stage of development may be found in a snake's mouth, and the ones behind move forward and replace any of the front ones that may have become broken. When, therefore, people talk of a snake's fangs growing again it is incorrect; they do not grow again, they are replaced.

The salivary glands are situated along the jaws and below the teeth, and the saliva is discharged through small openings in the membrane surrounding the teeth.

The poison glands are merely a development of the salivary glands, and vary in size in the different poisonous snakes. In the genus Adeniophis (not found in Ceylon) they extend to one-third of the way down the body, but in most snakes only occupy a small portion of the head.

The injecting of poison.

The gland is situated below and behind the eye, and is connected with the base of the fang by a small duct. When the snake bites, the fang presses upon the gland, forcing out a drop or two of poison, which, flowing down the duct, enters the canal in the fang and comes out of an oriface near the point of the tooth.

Snake-bite.

The effect of, and antidotes for, snake poison is a subject which has been much written about and much discussed, but very little has been discovered about it.

The symptoms of death from snake bite vary very considerably, and depend on the amount of poison injected, the part where it was injected, the condition of the blood at the time of the injection, the size and general condition of the snake, together with the amount of poison in its glands at the time, and the condition and general behaviour of the person bitten.

In most cases death from the bite of the common cobra (Naia Tripudians) seems to be almost painless, except for smarting in the member bitten, as convulsions and suffocation seldom take place until after the patient has become unconscious.

Results of Cobra-bite.

During my absence from Colombo the man in charge of my Serpentarium disobeyed orders, and allowed a coolie to handle one of my tame cobras, which bit him in the hand. My servant at once

tied a ligature and lanced the bite, rubbing in permanganate of potash as previously instructed. The coolie then went to hospital, where mortification of the arm set in. He recovered after nearly two months, but was not able to use his hand for some time.

A fowl which I once saw bitten in the leg by a cobra showed signs of sleepiness after three minutes, then sat down and fell on its side unconscious, when spasms and signs of suffocation followed, the fowl respiring slowly and spasmodically with its mouth wide open. Death occurred about five minutes after the fowl had been bitten. I have seen a rat killed by a cobra, with the symptoms above described. Death took place after thirty seconds.

A Russell's viper killed a rat in twenty minutes. The rat kept becoming giddy and recovering again, but at last fell over unconscious, when spasms and death took place.

These are the only deaths (of animals) from snake bite which I have seen, and on each occasion it seems to have been painless, as the animal was unconscious before any visible symptoms of discomfort took place. The eyes remained open, and did not close when touched. About fifteen minutes after death the fur of the rat and feathers of the fowl became loose, probably due to the mortification of the flesh as a result of the poison.

Some letters appeared in the Ceylon Government Directory relating to the effects and cures for snake bite.

I express no opinion as regards the theories, but give extracts from them, as they are interesting and contain much useful data.

Extracts on snake-bite, from the "Ceylon Directory."

"When about a dozen yards above the stream, I stepped off a rock on to a tuft of grass, when suddenly from the side of the tuft, a brownish flat

head struck at me viciously, but missed me by a few inches. I jumped back on the rock badly frightened, for I had recognised the snake as being the much-dreaded "tic."* I stood absolutely still for about ten minutes, peering about me through the tall grass, but could see nothing, though several times I heard rustlings down below. This got on my nerves after a bit, so taking a box of matches from my pocket, I set fire to the grass all round me, so that I soon stood in the centre of a blackened clearing. I then cheerfully lit my pipe, congratulating myself on my escape, and again started up the hill. I had not gone more than ten yards, when a flat, brown head struck at me again, and I felt a sharp prick on my right leg just above my boot. Regardless of another bite, I leapt after the snake, lashing at it with my stick in a sudden fury. Then I realised what had happened, and a nasty cold feeling seized me and sweat stood on my forehead. I knew that I had only two hours at most to live, and I felt an angry resentment against fate. Then my presence of mind returned, and, sitting down, I scratched the skin round the two little punctures away with my finger nails and sucked as hard as I could through thin grass stalks. This probably saved, or helped to save, my life. I must have sucked out some of the poison, as I felt a bitter taste in my mouth. I then turned and ran back to the bungalow, which was about three-quarters of a mile away. Arrived at the foot of the last flight of steps, I turned suddenly giddy, and sat down on a rock. Summoning all my will power to help me, I tottered up the verandah and yelled for the "boy," telling him to bring whisky at once. . . . . My friend . . . . . sent off a cooly for the nearest doctor. I was drinking tumblerfulls

---

* Russell's viper.

of neat whisky all this time. Then my leg went quite numb, so I limped across to the writing table and drew up a will, which he signed. Just as I had finished the pains came on; I writhed in my chair in agony. . . . . All this time the "boy" was rubbing my leg with limes, but I could feel nothing. After finishing a whole bottle of raw whisky I got more or less drunk, which is the only thing to do under the circumstances. . . . . I soon went to sleep, then began to turn grey, and my pulse stopped beating. The doctor injected strychnine and started things off again. My friend resigned himself to the fact that I was pegging out, when the local barber, a Tamil, ran up, saying he could cure master. . . . . He produced a small black stone shaped like an almond. . . . . First of all, passing the palms of his hands from my head to my feet several times, as if hypnotising me, he then placed the stone on the bitten place, where it stuck like a limpet. After several hours he took off the stone with great difficulty and placed it in some milk, which was quickly impregnated with the poison. He told me that I had been undoubtedly bitten by a ticpolonga. In the middle of the night the pains returned, and my friend sent off at once for the barber, who went through the same operation as before, telling me that the stone would drop off by itself in twelve hours. He applied the stone at twenty-five minutes after midnight, and it dropped off at twenty minutes to one the following afternoon! My leg is now sound again, and, except for occasional cramp, causes me no trouble."

Mr. E. E. Green, of Peradeniya, in reference to the poisonous snakes of Ceylon, writes as follows:—

"But we have more than one species of venomous snake, the bite of which is seldom, if

ever, fatal. Our smaller viper (Ancistrodon Hypnale) is a case in point. I have had particulars of several occurrences of coolies bitten by this species. Though the resulting symptoms were alarming at the time (partly due, probably, to nervous shock), the patients recovered without any special treatment having been applied. Boulenger reports of this snake, that 'its bite is said to be but exceptionally fatal to man.' The fully-grown Ancistrodon averages about a foot and a half in length, and bears a superficial resemblance to the large 'Ticpolonga' (Vipera Russellii). Our 'Green Tic' (Trimeresurus Trigonocephalus)—though of villainous appearance—is still less deadly. It has been stated by an Indian authority that the bite of this snake is seldom followed by worse symptoms than a severe headache. I have heard of a man who deliberately chopped off a finger after having been bitten by a 'Green Tic,' and was satisfied that he had saved his life by so doing.

"It may be said that at such a critical time no man would wait to kill the snake; but apart from the scientific interest of the determination of every snake that has bitten a man with serious results, much inconvenience, and even some loss of life, might be avoided by the discovery that the assailant was either harmless or not fatally venomous. For there are well-established cases of death following upon the bite of a non-venomous snake—due to fright and consequent nervous prostration."

The following is an extract from a letter on the "Snake stone" and snake poisons:—

"The so-called stone is animal charcoal. It sucks the poison if applied immediately after the bite. The bite of the cobra is more dangerous, in so far as the poison circulates more rapidly, and if instantaneous remedies are applied the poison is

soon got under. But not so the bite of the Ticpolonga. It takes a longer time for the poison to take effect—from four to ten hours. What I mean is, while the cobra bite proves fatal within three or four hours if not treated, the bite of the Ticpolonga will not kill a man for about twelve hours or so; but it is exceedingly difficult to bring out the poison of the Tic."

In the "Visitors' Book" in Nalanda Resthouse there is an entry dated July 24th, 1908, evidently made by someone who had been stopping at the Resthouse, mentioning that "the Resthouse keeper's son had been bitten on the foot by a large cobra; that a native doctor had been sent for and applied remedies, but the patient was in a very bad state." The writer also mentioned that he was obliged to leave the Resthouse without waiting to see the outcome of the bite, but, that should the boy recover, it would be a marvellous cure and should be inquired into.

It was about three weeks afterwards that I read the above statement in the Resthouse book, and found the patient (a youth of about 22 years) to be quite recovered, though the fang marks were discernable in the side of his foot. Upon inquiry I learnt that, although some time had elapsed before the arrival of the native doctor, and the foot was much swollen, the latter had managed to cure him by giving him herbs to eat, and by putting a herb in his own mouth and sucking the wound. There was no cauterizing or lancing. The patient suffered extreme pain in the night, and his leg became much swollen, showing that the poison must have got well into the wound. I do not know whether the doctor repeated the treatment, but the boy got all right in a day or two, and suffered from no subsequent illness or weakness, such as is usual after receiving a large dose of poison into the system.

The doctor had a local reputation for the cure of snake bite.

The average number of deaths from snake-bite in Ceylon is about 200 per annum, and when the number of deaths that occur in the island from other causes (about 125,000) is taken into consideration, the mortality from snake bite seems surprisingly low, especially as the movements of the natives are practically noiseless, and he must run considerable risk, when in the jungle, of suddenly stepping on to a snake lying asleep in the grass. This low mortality is, I believe, due to the fact that, though snakes are numerous in Ceylon, the percentage of deadly specimens is exceedingly small. I consider the danger from snakes is much exaggerated, and that the increasing spread of rabies in the island is a far greater menace to its population.

Many antidotes have been tried for the cure of snake-bite, but no infallible cure has as yet been found. Amongst the best remedies at present relied on is the injection of permanganate of potash crystals into the wound, which, although a very successful absorbent remedy, is reported to have a poisonous effect on the blood. The injection of strychnine has also been adopted with success. When a "poison destroying" remedy is injected into the blood a tight ligature should be placed above the wound (the longer the poison has been in the system the higher the ligature should be placed. This prevents the carrying of the poison to the lungs and heart by the blood, but it also has the effect of concentrating the poison on the lower portion of the limb, and although it may help to save the patient's life, it is liable to cause severe gangrene in the portion below the bandage.

Innoculation, if successfully done, is a great safeguard against the effects of a snake-bite, but

the innoculation is fraught with much danger, being as yet merely in the experimental stage, though I fully believe it has been practised for many years by Indian and Burmese snake-charmers.

What is still required for the cure of snake bite is, not so much a remedy—of which there are many good ones—which will absorb and neutralize the poison, but either a means by which this neutralizer may be enabled to reach the poison, or a treatment for keeping up the vitality of a patient until the poison becomes absorbed by the system. If there has been much delay after the bite, local treatment is practically useless, and everything depends on a general treatment of the system.

The poison of the Opisthoglypha, the back-fanged snakes, is so slight as to be hardly noticeable to human beings whom they have bitten, but it probably paralyses the small birds and reptiles on which they live. The reason for this is explainable in the case of the Tree-snakes, which have very thin skins, as the struggles of their prey when caught would probably injure the delicate skin of their throats were it not for the poison contained in the back fangs, which paralyses the victim. The skins of some of these snakes are so delicate as to be transparent when dry.

I have allowed specimens of Dipsas and Dryophis to bite me, but have never felt any appreciable effect of the poison, but a "bungalow servant" who was bitten by a large Dryophis Mycterizans suffered from local pain and swelling for a couple of days. A young wild kitten I kept died in great pain from the bite of the above snake, which I found in its box about two hours after receiving the bite, the symptoms being giddiness, followed by spasms, and insensibility.

Chapter IV.

THE NINE FAMILIES OF SNAKES.

Snakes are divided into nine Families, which in some cases are divided again into Sub-families.

The Families are as follows (using Prof. Boulenger's classification) :—Typhlopidae, Glauconidae, Boidae. Ilysiidae, Uropeltidae, Xenopeltidae, Colubridae, Amblycephalidae, Viperidae.

Distinctions between the Nine Families.

1. The *Typhlopidae* are small cylindrical snakes, with short tails ending in a spike. They belong to the lowest order of snakes, and having no ventrals, resemble worms. The extension of their jaws is exceedingly limited, and they have traces of rudimentary hind legs, which, however, are hidden under the skin.

2. *Glauconidae.*—There is only one genus in this family. The upper mandible in these snakes greatly overhangs the lower jaw. In other respects they much resemble the Typhlopidae.

3. *Boidae.*—This family is closely connected with the Ilysiidae in having traces of rudimentary hind legs, which, in the genus Python are visible in the form of thorn-like projections on each side of the anal. The spurs are also visible in the male Gongylophis. The three genera in the family, Python, Gongylophis, and Eryx, kill their prey by constriction. Although large snakes, their rudimentary hind legs and narrow ventrals point to their close connection with the Earth-snakes.

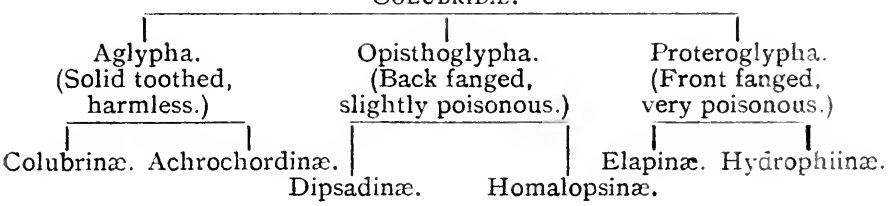
4. *Ilysiidae.*—A family of short cylindrical snakes with conical tails, very narrow ventrals, and visible traces of hind legs.

5. *Uropeltidae.*—This is a large family, composed of burrowing snakes with cylindrical bodies,

short shield pointed tails, and very small ventrals. Some species have beautiful irridescent skins.

6. *Xenopeltidae*.—Only one genus, and one species. A small irridescent snake, with narrow ventrals, and with the outer rows of scales enlarged.

7. *Colubridae*. This is by far the largest family of snakes, and contains all those species that have no striking peculiarities such as would serve to classify them for any other family. In fact, one might say that the members of the Colubridae got placed in that family by the *reductio ad absurdum* method. The Colubridae are divided as follows :



Sub-divisions of the Colubridae.

The Aglypha are harmless snakes with solid teeth.

The Opisthoglypha have their back teeth grooved for poison, and are slightly poisonous.

The Proteroglypha have well-developed poison fangs in the front of their mouths, and are extremely poisonous.

The sub-family Colubrinae contains the greatest number of the common harmless Colubers, including terrestrial, semi-aquatic, and a few arborial species (some of the latter with lateral keels) ; also several intermediate genera that link the Colubridae with the Earth-snakes.

The semi-aquatic snakes (Tropidonotus, Helicops, etc.) belonging to this sub-family have not the construction of the true water-snake, but resemble the rest of the Colubrinae, though their

skin (in some species) is somewhat tightly welded to the vertebrae.

The Achrochordinae is a small sub-family of snakes which connects the semi-aquatic forms mentioned above with the Sea-snakes.

These snakes are covered with small tubular and strongly-keeled scales, and some of the genera have no ventrals, but have slightly compressed tails, and resemble the Hydrophiinae.

The Dipsadinae belong to the back-fanged class. The largest and most important genera are arboreal (Dipsas, Dryophis, Chrysopelea), and have compressed bodies.

The Homalopsinae are the true fresh-water snakes, with nostrils on the upper surface of the snout, and rather compressed tails. They also belong to the back-fanged group.

The Elapinae are, apart from the Bungarums, better represented in Australia than in the East. They are poisonous front-fanged Colubers, and include many of the most deadly snakes in existence.

They are regular in shape, except for the genus Callophis, which is composed of small thin snakes that in outward appearance resemble earth snakes, are often known as Coral snakes, and are most numerous in Australia. The Elapinae, by the way, are all terrestrial.

The Hydrophiinae are the sea-snakes proper, front-fanged, and very deadly, with granule-like scales, flat tails, and no ventrals.

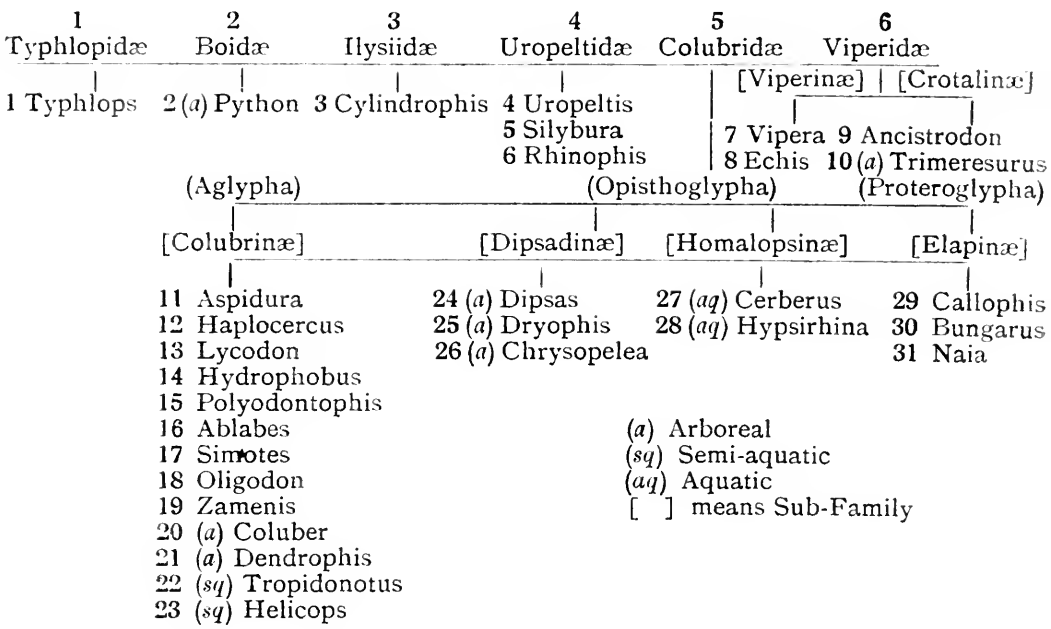
This concludes the family Colubridae.

8. The *Amblycephalidae* are blunt-headed snakes with compressed bodies. They can only expand their jaws slightly, have no mental groove, and are harmless.

9. The *Viperidae*. This family is divided into two sub-families (1) Viperinae, (2) Crotalinae. The

latter are distinguishable by the pit they have between the eye and the nostril, and are commonly known as "Pit Vipers." All vipers are very poisonous, and have enlarged fangs, capable of being erected or depressed, and a well-developed poison apparatus.

Table of the Terrestrial Genera of Ceylon.



The Acrochordinae are not represented in Ceylon, except by Chrysydrus Granulatus, which, being practically a Sea-snake in its construction and habits, I have omitted, together with the Hydrophiinae. Gerardia Prevostiana I have also omitted, its existence in Ceylon being doubtful.

Chapter V.

A SIMPLE MEANS OF IDENTIFYING THE POISONOUS SNAKES OF CEYLON WITHOUT SCIENTIFIC KNOWLEDGE.

There are many people who are desirous of identifying the poisonous varieties of Ceylon snakes when met with, but are unwilling to make a detailed study of head-shields, scaling, and dentition, etc., necessary for the identification of a snake. In order to identify a snake by scientific methods, it is also necessary to catch or kill it, which many people are unwilling or unable to do.

The dangerous snakes of Ceylon—that is, those which will or are liable to cause death are so few, however, that it is comparatively easy to recognise them.

Brief Identifications of the Proteroglypha and Viperidae.

1. Naia Tripudians (Common Cobra). This is the most common and the most virulent of the poisonous snakes of Ceylon, and is easily recognisable by anyone who has once examined one.

It is a thickish snake of black, brown, or grey, with a dilatable neck (or hood) marked with a white inverted spectacle pattern, often on a pinkish background. The under surface is crossed with wide black bars.

The only snake that at all resembles it is the harmless Zamenis Mucosus (Rat-snake), though no one who has ever compared the two is likely to confuse them.

The Zamenis, in addition to differing in the shape of the body and head, has no black bars on its under-surface, and its neck is not dilatable to any great extent.

2. The Vipera Rusellii (Brown Tic-polonga). This snake, though less virulent than the cobra, is more deadly, owing to the superior length of its poison fangs, which enable it to inject its poison deeper into the system, and makes a cure of the bitten person more difficult.

This viper is perhaps the easiest snake to recognise, on account of its short, fat body, stumpy tail, and the black, chain-like pattern along its back. It has a series of large black blotches or spots along each side, and the head is triangular and scale-covered.

3. *Bungarus Ceylonicus.* This snake is very deadly, and belongs to a genus which is considerably better represented in India than in Ceylon, where only two varieties are found. The colour is black, with white rings, and the belly of the young is uniformly white.

The Bungarus is liable to be confused with the harmless Lycodon Aulicus. The former, however, has a round head, with eyes far forward, and (if an adult) black bars underneath. The latter has a pear-shaped head, eyes rather far back, and is uniform white on the belly.

4. The *Bungarus Caeruleus* is rarely met with, so a detailed description is unnecessary. It is like the above, only that the belly is uniformly white, and the rings are closer together.

5. *Trimeresurus Trigonocephalus* (Green Tic-polonga). The Trimeresurus is not by any means always deadly in its bite; in fact, human beings usually recover. It is a bright green snake, with black spots or blotches along the back. Its head is pear-shaped, very distinct from the neck, and covered with scales. The under-surface is yellowish, and the tail short and very prehensile.

6. *Ancistrodon Hypnale.* Seldom fatal in its bite. A short thick-set viper, with an upturned

snout. It is of a brownish ash-colour, with large black spots ranged alternately on either side of its back. The head is triangular, very distinct from the neck, covered with scale-like shields, and with small white lines along the upper lips. The black spots are often almost invisible in the young.

7. *Echis Carinata.* A rare snake, found only in Jaffna and the dry portions of the Island. Being seldom seen, only a brief description is necessary.

A short, brown, round-headed viper, with white festoon markings along the sides; the apices of which are joined across the back by narrow white lines. The scales are very strongly keeled, and the snake makes a sawing sound by rubbing two portions of its body together.

8. *Callophis Trimaculatus.* Very few specimens of this snake have been found in Ceylon. I obtained two specimens near Matale, and other specimens have been found at Tissamaharama and Trincomalee. Although poisonous this snake is so small and slender that the teeth cannot pierce the skin. It is light brown above, with small spots along and on each side of the back. The under-surface is scarlet, with a black band at the beginning and end of the tail, the under-surface of the tail being bright blue.

Although the recognised poisonous snakes in Ceylon are eight in number, Major Wall mentions one other in his book, "The Poisonous Terrestial Snakes of our British India Dominions"—Ancistrodon Millardi (Millard's Viper). As it resembles the Ancistrodon Hypnale very closely, this variety has either escaped the notice of the authorities on Eastern snakes, or has been recognised as a variation of the Ancistrodon Hypnale, and not as a separate variety. Trimeresurus Gramineus has also been reported from Ceylon, but its existence in the country is doubtful. It may be mentioned

that all the poisonous snakes of Ceylon have broad ventrals (as well as many harmless varieties), the ventrals being so broad that if turned on its back the outer rows of scales of the snake are invisible, except in one or two places.

Chapter VI.

SNAKE HUNTING, SKINNING AND PRESERVING.

For those who are desirous of obtaining snakes, either for bottling, skinning, or keeping alive, the following methods of capture may be recommended, and the following necessary point borne in mind—that when snake hunting it is less important to go where there are a great many snakes than to go where the nature of the country facilitates seeing and catching of them, even if the snakes there are fewer in number.

Cobra catching.

The Cobra. Being seldom met with, a cobra is best obtained by digging one out of an antheap or hole. The cobra must have been seen to have entered the hole a short time before, as it is their custom to change their holes frequently. The presence of a newly-shed skin is often the clue to a hole where a snake is living.

It is most advisable to dig out a cobra in wet weather, as the earth is softer, and the snake is more likely to be in its hole at that time. You should not attempt to dig out an anthill before eight o'clock in the morning, or after six o'clock in the evening, as the snake will probably be out hunting then. It is seldom that cobras lie out under a hot sun except after wet weather. (All the cobras I have kept, and I have kept at different times between twenty and thirty, have shown a distinct dislike to strong sunlight, and have always chosen the shady portions of their cages to lie in.)

Taking a man with you, you approach the antheap, making a certain amount of noise so as to frighten the cobra back into its hole should it

happen to be out at that time. If the antheap happens to be on the side of a hill the snake is almost certain to retreat downhill after breaking cover. The earth from the anthill should be thrown on the lower side so as to form a kind of barricade.

It is seldom that a snake will show itself until the last hole of the anthill has been dug out (and thereby thoroughly explodes the theory of the vicious disposition of serpents). Care should be taken that all the holes of the antheap are either watched or blocked up; sometimes there is a long underground passage terminating in an exit in some adjoining jungle, and the cobra escapes by this exit, which has probably not been detected by the watchers.

Cobras are very clever in escaping detection, and as you dig out the different portions of the antheap the snake will escape unperceived by a passage into a different portion, and will probably be eventually discovered coiled up at the extreme end of the last hole. It is nearly always necessary to dig out practically the whole antheap before the snake is seen, and very often the entrance of the occupied hole gets stopped up by earth from the rest of the antheap, and one goes away in disgust, under the impression that the entire antheap has been dug out, and that it was unoccupied at the time of digging.

After everyone has gone, and when night is falling, the cobra burrows its way out of the hole (probably laughs, if a snake is capable of such an action) and betakes itself to a safer habitation.

A cobra seldom breaks cover at once. It usually puts its head out of the hole and then withdraws it. When it makes a dash for liberty it will be somewhat delayed by the barrier of earth (formed from the portion of the anthill that has been broken up).

Should it attempt to escape uphill (which is very unlikely) it can be easily captured, as snakes cannot move fast uphill.

If it is to be kept alive you should capture the cobra by pinning it to the ground with your stick placed across its body. Another stick should be placed across its head (and should it manage to wriggle forward it can be drawn back by the tail until the head is under the stick). A forked stick comes in useful for placing upon the head, but is not necessary. Then take the snake firmly behind the head, your thumb and finger being on each side of the neck, and not above and underneath the neck, as the snake could turn its head laterally and run its fangs in. This action should be done quickly but not hurriedly or nervously. It is a good plan, and a great safeguard, to fling a bit of cloth into the snake's mouth before taking it behind the head. It will at once bite at the stuff, and should it slip its head from under the stick at a critical moment will be hindered from biting, its teeth being caught in the cloth. The fangs may be cut off with scissors without injury to the snake, if a fangless specimen is preferred, but the old fangs will be replaced by new ones in about a month's time.

A forked stick is not of much use to capture a snake with, though it comes in useful afterwards, as it is difficult to pin a snake that is travelling at all fast, and undulating laterally, with a forked stick.

Smoking out Snakes.

Driving snakes out of holes by means of smoke is an unsatisfactory proceeding. It takes a lot of smoke to have any effect on a snake, owing to the latter's large lung capacity. The snake will often die in its hole, especially when sulphur is used.

On several occasions I have tried "smoking

out" snakes, but seldom with any success. On the few occasions on which I managed to drive cobras out of their holes by it, the smoke was so suffocating and so blinding that the capture of the snakes was extremely difficult and somewhat risky. On another occasion I attempted to dislodge a cobra and a variety of Dipsas from the roof of a native hut by fastening chatties filled with lighted sulphur under the thatch. The inhabitants of the house were nearly suffocated, and so were the people next door, but the snakes did not mind, although smoke was passing in great clouds through the roof.

Python catching.

The Python is extremely difficult to obtain when required, and often much patience, enquiry and hard work is necessary before a specimen is obtained. It is of course necessary to know something about the habits of a snake before attempting to catch it; I therefore append a brief account of its manner of hunting when in its wild state.

Its habits when wild.

There is only one variety of Python found in Ceylon—the P. Molurus. It inhabits swampy districts and places where there is a heavy rainfall, and is often found lying in jungle ponds with only its nose exposed above the water.

As the sun begins to set the snake glides from the water. There is no noise, only a track of crushed grass to show where the Python has been. It reaches the jungle and, its yellow and black skin blending with the shadow and sunlight, disappears.

A deer comes down the game track on its way to the pool to drink. The small clump of long grass arouses no suspicion, not being large enough to conceal a leopard.

Yet within that clump the python lies coiled like a spring, its flat head slightly raised, and its

powerful neck curved back, ready to make the lightning stroke.

The deer approaches and reaches the grass. A flash of yellow, a choking cry, and it lies gasping its life out in the deadly coils of the Python which has seized it, rolled it over, and wound round it like cotton round a reel. A little more gasping and it is over. Slowly the coils relax, and the flat pink head shakes its teeth loose of the deer's throat. Then slowly and deliberately the Python starts to move its nose over,under and about the deer, salivering it, so as to digest it easily. This occupies ten minutes or so, then the swallowing commences. Grasping the deer by the head, and flinging its coils over the body, so as to break the bones, first one side of the jaw is projected and then the other. Caught by the hooked teeth, the deer slowly, very slowly, is drawn down the snake's throat, being again crushed in the process by the muscles of the gullet, the Python's mouth being at this time extended to nearly twice its normal size.

. . . . . .

Half an hour passes, and the Python, much distended about the centre of its body, fades again into sunshine and shadow to sleep off its meal.

Suitable "Python Country."

The Python may be obtained in several ways, but it is, of course, necessary to choose the right type of country to hunt in. The wide stretches of grass and scrub lying between a "Tank" (artificial lake) and the large surrounding jungle, are perhaps the best, not because there are likely to be most pythons there, but that if there are any, you are more likely to see and catch them in such a country. The place chosen must, of course, be beyond the disturbance of civilization.

The evening is the best time for python-hunting, especially after a shower of rain, and

you may employ two methods. One is to walk quietly along the game-tracks just inside the main jungle (the edges of the jungle are more accessible than the interior, and there is less likelihood of getting lost, with greater facilities for the capture of any snakes seen and required). A sharp look out should be kept along the game tracks and under the bushes and undergrowth, for any python that may be lying in wait for game that is going down to the "Tank" to drink, or is sleeping stretched out across a path, after a gorge.

A python when disturbed, and retreating through the jungle, makes a noise resembling the dragging of heavy sacks along the ground. If alarmed, and moving rapidly, when approached, it must be seized by the tail, and an attempt made to press its head against the ground with your foot, or, if accompanied by a coolie, a stick can be placed by him across the snake's head. It should then be taken and held by the neck with one hand and by the tail with the other. Of course it will attempt to bite, and when seized will attempt to crush, but this sort of thing has to be chanced, and adds to the excitement, for there is a certain amount of excitement, especially with a large python, but it does not do to get excited.

The way to capture a python, without injury either to oneself or the python, cannot be explained, but can only be learnt by practice, and even then there is the likelihood of being bitten.

Except in the case of a very large python, there is no danger, though the latter is capable of inflicting a very severe bite, tearing up the muscles with its curved teeth, and probably disabling the member bitten for some time to come. If, when catching a python, you are seized by it, you should at once release your hold of the snake, when it will in all probability leave go of you, in order to escape.

If the snake is found asleep in the jungle, it can often be captured without any trouble, if approached quietly and seized suddenly. It is easiest to catch a python after it has had a meal, as it is less liable to strike or try to escape.

Beating jungle with coolies.

Another method of catching these snakes is to set out in the evening, accompanied by some coolies, and beat the land round the "Tank" in the following manner:—The coolies should walk in an oblique line, stretching from the tank to the jungle, and should move parallel as much as possible with both. Taking the space to be covered (between tank and jungle) to be 100 yards in width, the first coolie should move alongside the tank, and a few yards from it. The second coolie should be about 25 yards away (to the side) of the first coolie, and about 5 yards behind him, the third coolie should be 25 yards from the second, and five yards behind him, the fourth coolie should be 25 yards away from the third and five yards behind him, and the fifth—the person who is to catch the snake—should walk alongside the jungle.

The first two men should make a certain amount of noise, the other two should be comparatively quiet; the man by the jungle should be as silent as possible.

Any snake that may be drinking water, or catching frogs, by the side of the "Tank," will, on hearing the first man approach, make a fairly straight line back to the jungle. The first man will at that time be about eight yards from the snake, and the man near the jungle will be twenty yards behind the line of the first man. The snake will probably retreat at a rate of from six to seven miles an hour, or perhaps a little less, and as the men will be walking at a pace of two miles an hour, the snake will pass within a few feet of the man near the jungle, who will attempt to catch or

kill it, as the case may be.

Other snakes may be caught in the above manner also.

Other methods of catching snakes are: to stalk them while laying asleep under bushes, to take them by surprise when lying across roads (fast walking is necessary, and the snake, imagining that it has not time to escape, lies still, trusting in its protective colouration to save it), and to ambush them at waterholes (a tedious process); to search under logs and brushwood, and to burn or cut down jungle. Other methods of snake catching.

The latter is by far the most satisfactory way, but it is not always possible, and when it is, comes rather expensive. The snake that gives the most sport when catching it is the large Rat-snake, in spite of the fact that it is harmless. Catching the Zamenis Mucosus.

Although Rat-snakes are found all over Ceylon, it is preferable to hunt them on an estate at an altitude of about three or four thousand feet, as the up-country Rat-snakes grow to a very large size, and considerably more sport is obtainable by catching them in a difficult rock-covered country than in the flat lowlands. I suggested hunting them on an estate because practically all the land at that elevation which is not cultivated is jungle, which latter grows too densely on the mountains to permit of snake-hunting being possible.

If the country is difficult, the assistance of a few coolies is necessary. Often when walking along quietly a snake may be seen lying like a black streak across the mountain path, with its head under a bush to protect its lidless eyes from the glare of the sun. As you approach the serpent will slowly draw its body across the track and retreat down the slope. If you can reach it in time you may take it by the tail, but once the snake knows that it has been seen the slow gliding

motion will give way to a whip-like lashing as the serpent retreats down the hill. If the latter is steep, and the ground bad, the chances of catching the snake will be practically nil, unless you have coolies lower down, who will drive it so that it will move along the hillside instead of downhill. The reptile may be cornered or taken by the tail as it is entering a hole in the rocks. If the snake is a large one (of some seven or eight feet in length) and gets its body well into the hole some little time may elapse before you can draw it out, for when once a snake has got a hold, however slight, for its body or its coils its power of traction is tremendous.

If a Rat-snake of some eight feet in length gets its coils round a raised beam it can, with the posterior portion of its body, draw up, for several inches, a man weighing nine stone.

This sounds incredible, but if anyone disbelieves me they should get two strong men and tell them to try and pull out, to full length, a large and uninjured Rat-snake.

When you eventually get your snake out the trouble will begin. A Rat-snake when caught or cornered becomes extremely savage, and will therefore give you a lively time. Retaining your hold of the tail, you must endeavour to put either your foot or a stick on the snake's head without injuring it.

The snake, on the other hand, will have no scruples about inflicting injury, and (being supported by its tail) will keep drawing its body up and striking repeatedly at your face. The snake must be made to miss its aim by jerking the tail, and the blows parried with a stick.

The head having been eventually pinned to the ground, and the neck seized, the serpent will coil round your wrist, and bringing its full power into play, in an ingenious manner, attempt to

force your fingers off its neck.

The skin of the Rat-snake is not worth keeping unless it is a very large one, and the snake is only worth hunting for the amusement afforded.

Most of the "hill" Rat-snakes have white ventrals, while most of those found in the low country have yellow ones.

Catching Water-snakes

Water-snakes can be caught in the water-courses adjoining paddyfields, but there is much likelihood of being bitten, as these snakes are very quick in striking. When landed they will often proceed along the ground by a series of leaps.

Bottling Specimens

Snakes may be either bottled in spirits, stuffed or skinned. Bottling is somewhat unsatisfactory, as the snake is liable to lose its colour, change its shape sometimes, lose its scales, and even decompose after the spirit has become weak, in addition to which only small snakes can be preserved, owing to the large amount of spirit required in proportion to the size of the snake. Snakes should not be bottled straight off, but be allowed to soak in spirit before being finally placed in a bottle filled with fresh spirit. Dr. Nicholson, in his book, "Indian Snakes," recommends the following mixture as a preservative:—Rum or arrack (20 to 30 under proof), and added to which either 4 per cent. of carbolic acid or 2 per cent. of carbolic acid and 1 per cent of arsenic. An objection to bottled specimens is that they occupy a great deal of room and are difficult to pack.

Stuffing.

Stuffing a snake is somewhat difficult, and can only be done satisfactorily to certain varieties; even then the head is liable to be mounted in quite a different shape to what it was in when the snake was alive. Stuffed specimens, like bottled ones, take up a great deal of room, and should be kept in glass cases in order to remain in good

condition. This method of preservation is somewhat expensive, especially if a good taxidermist is employed.

In my opinion the best thing to do with a snake is simply to take its skin. Of course it is impossible to get so good an idea of the shape of the snake's body as it is with a bottled specimen, but as the skin retains its colour (in most cases), and the head can be retained in its original shape by the non-extraction of the bones of the skull, one can judge very closely what the appearance of the specimen was when alive.

Skinning.

The best method of skinning a snake is as follows:—Take a point above the end of the tail (just where it is about a quarter of an inch wide in the case of a large snake, and at a corresponding proportional point if a small snake) and cut from there, along the centre of the subcaudals to the ventrals. Cut along the centre of the ventrals, to the juncture of the lower jawbones. Now take the point where the incision was started, and cut through the flesh and muscle, between the vertebrae, so that the end of the tail is connected with the remainder of the snake by only the skin itself. Taking the end of the tail in one hand and the severed mass of flesh and vertebrae in the other, proceed to pull the skin off the latter until the ventrals are reached, where there will be resistance. Here you must cut through muscles, and the anal attachments, until the skin is free again, when it will pull off easily until the back of the head is reached. Here separate the head from the skinless body of the snake, by dislocating the first or second vertebra, and cutting through all attachments but the skin. Some of the soft portion of the inside of the head should be scraped away, but the rest will dry up, as will the eyes.

The advantage of this method of skinning is,

that you have the head in its original shape, and the whole tail can be obtained. The narrow uncut portion of the tail will dry up if there is not too much fat on it, in which case drying may be facilitated by opening the subcaudals down to the tip.

The Rat-snake is somewhat difficult to skin, owing to the close welding of the epidermis to the flesh.

The water-snakes, Helicops Schistosus and Tropidonotus Quincunciatus, are difficult to skin for the same reason, and the skin has to be separated from each vertebra with scissors. The least pulling on the skin of the above two snakes will cause it to break. When dry the skin is stronger.

The skull of a snake cannot be taken complete, like that of an animal, as it is formed of many small bones, that fall apart after the soft tissues have been removed.

" Stretching " is best done as follows :—

Stretching.

After the skin has been taken, stretch a string down the centre of a board, and fasten it to a nail at each end. Next proceed to nail the nose and tail of your snake to the plank, stretching the skin as much as possible, and being careful to see that both nose and tail are beneath the string. Stretch the skin laterally, and fix it with tacks, or old gramaphone needles (preferably the latter), placed at intervals along each side. The intervals between the tacks should be approximately $\frac{1}{72}$nd of the entire length of the skin. The head should be fixed with tacks and pins in such a manner as to make it dry in its original shape ; and, in the case of poisonous snakes, the fangs should be kept in an upright position, by means of tacks placed on each side of the head (near the fangs), and a pin placed across them and resting against the fangs. Preserving

mixtures, such as corrosive sublimate, may be put on the skin, but are not necessary.

Drying. Drying may be done in the sun, though hot ashes are preferable, especially for drying up the head cavities.

When dry the skin should be trimmed with scissors (the nearer the tacks have been placed together the less skin will have to be removed in trimming), and pressed between planks, to counteract a tendency to curl. If desirable the skins may be mounted on red flannel.

The thin skins of certain Tree-snakes often lose their colour and become transparent when removed from the body. These should be gummed on to paper or cardboard of the same colour as the skins originally were.

A skin prepared as already described should make a fine trophy and curiosity, showing, as it will, all points necessary for the identification of a specimen: headshields and shape of head, dentition, ventrals, sub-caudals, and shape of tail.

Many taxidermists cut off the ventrals when trimming a skin, but I consider that this spoils the specimen, as far as scientific interest is concerned. A well-taken and well-stretched skin (plenty of pins being used) requires very little trimming, but although good skinning is easy enough, with a little practice, it requires some little experience before one can stretch a skin in such a manner as to do full justice to its elastic possibilities, and at the same time get it even and uniform, with a minimum of sagging between the tacks.

Chapter VII.

SOME RECORDS OF SNAKE HUNTING.

The Anuradhapura country.

One of the finest places in Ceylon for snake catching, both on account of its accessibility and the geographical features of the surrounding country, is Anuradhapura. This is the only place situated in the midst of the large Northern forests where there is an hotel, and one does not have to depend upon Resthouses, which latter are unsuitable if a long stay of three weeks or a month is intended.

It is true that the rapid progress of civilisation has driven away much of the game from the nearer forests, but it has not, to any appreciable extent, diminished the vast number of snakes to be found in that district, and even in Anuradhapura itself. In fact, snakes are rather partial to human habitations. Houses mean food, and food means rats and mice, which are dainties much sought after by snakes; in addition to this, there are the numerous "Tanks," jungle ponds, paddy fields, and artificial waterways, and last, but not least, the crumbling ruins, creeper-covered, and a mass of crannies and holes. All these features combined make the Anuradhapura district one of the "snakeyest" in the Island.

During the three weeks that I spent there, snake catching, in December '09, I obtained the following specimens, in addition to many which I saw and did not catch, and many which I caught but did not kill and skin:—

5 Ancistrodon Hypnale,
7 Zamenis Mucosus,
1 Dendrophis Pictus,

1 Hydrophobus Nympha,
4 Lycodon Aulicus,
1 Tropidonotus Stolatus,
1 Dryophis Mycterizans,
1 Oligodon Sublineatus,
1 Tropidonotus Quincunciatus.

Although I stopped three months at Anuradhapura, all these snakes (22) were caught within two weeks, an unusual run of luck.

The Ancistrodon Hypnale seemed to be very numerous round Anuradhapura, and also at Minneriya, but during two years of snake hunting in the Central Province I only succeeded in obtaining two specimens. All the specimens I obtained of this snake were caught in a patch of jungle that was being cleared, and they seemed to live chiefly among tree stumps and in rotten wood, which fact is also borne out by their colouration. A sixth Ancistrodon was killed by coolies, but was chopped to pieces. All the Lycodons I obtained (four in number) were found in the mud wall of a hut which I broke down. I also found a fifth one, but let it go on account of its small size. The owner of the house was so alarmed at the number of snakes caught, that he insisted on also breaking down the wall of another house that he was living in, in order that I could kill any snakes that might be found there. The man's fear is accounted for by the fact that the Sinhalese mistake the Lycodon for the deadly Bungarus Ceylonicus; they call it Mapila (or sometimes Karrawila), and believe that it kills men by sucking their blood away.

Large Rat-snakes.

Two of the Rat-snakes (Zamenis Mucosus) which I obtained were of extremely large size. One was 9ft. $6\frac{3}{4}$in., and the other 9ft. $3\frac{1}{2}$ in. Out of the many Rat-snakes I had killed previously at different times, only one had exceeded 9ft. (a specimen 9ft. 4in., killed in the Knuckles district).

One or two others measured about 8ft. 3in. or 8ft. 6in., about seven or eight were over 7¼ft. in length, and the average length of the remainder (about forty or fifty) was about 6½ft.

The Hydrophobus Nympha was the first specimen I had obtained of that variety, and was killed in the bath!

Dryophis Mycterizans and Tropidonotus Quinquinciatus were very common, but having many specimens of these, I did not trouble to kill any.

At Anuradhapura a very fine Dipsas Forstenii (the red variety) was shot, and measured 6ft. 8¾in. I now have the skin in my collection, the gentleman who shot it having kindly given it to me.

Pythons are numerous in the Anuradhapura district, but it is necessary to go at least two miles outside the town before likely country is met with. The far end of the Tissawewa is a good place, as are the jungles round the Balankulam, but the latter, though pythons are numerous in them, are rather too thick to facilitate snake hunting.

The snakes of the Kurunegala District.

I found Kurunegala to be, during the dry season, an almost better place for snake hunting than Anuradhapura, as, in the evening, owing to the draught, the snakes were obliged to leave the jungles and enter the paddy fields, in search of any water that had not dried up since the previous flooding.

In one paddy field alone, in the course of a month, I caught over forty specimens of Tropidonotus Stolatus, though needless to say I did not keep them all. There were also many colonies of T. Plumbicolor, though I have found this snake to be somewhat uncommon in other parts of Ceylon.

Three specimens of Z. Mucosus which I obtained measured 9ft. 6in., 9ft. 8¾in., and 10ft., while a snake charmer brought me a Dipsas Barnesii, about 4½ft. long.

The varieties found during the months of March and April were as follows:—

Dendrophis Pictus,	Tropidonotus Submineatus,
Lycodon Aulicus,	,, Plumbicolor,
Vipera Russellii,	,, Stolatus,
Naia Tripudians,	,, Asperrimus,
Oligodon Subgrisens,	Zamenis Mucosus,
,, Ellioti,	Ancistrodon Hypnale,
Dryophis Mycterizans.	

Breeding Seasons.

Many of the female specimens of Z. Mucosus, N. Tripudians, L. Aulicus, A. Hypnale, T. Stolatus, and T. Plumbicolor, had eggs in them, and their breeding season seems to have been during May and the beginning of June.

I append a list, giving the average dimensions to which the common snakes of Ceylon grow.

Average Dimensions of Ceylon Snakes.

Snake.	Average Adult Size.
Naia Tripudians (Cobra)	5ft. 2ins. (Cobras have been known to grow to 6ft. 6ins., but anything over 5ft. 2ins. may be considered large.)
Vipera Russellii (Brown tic-polonga)....	4ft. 6ins.
Trimeresurus Trigonocephalus (Green polonga)	2ft. 4ins.
Lycodon Aulicus	19ins.
Zamenis Mucosus (Rat-snake)	6½ft. is the average length of an adult, but it varies considerably, and many grow larger.
Coluber Helena	Between 4ft. and 5ft.
Bungarus Ceylonicus	2ft. 8ins.
Ancistrodon Hypnale	1ft. 3ins.

Snake.	Average Adult Size.
Dryophis Mycterizans	About 4ft. 8ins. (up country variety). 5¼ft. to 6ft. (low country variety).
Dryophis Pulverulentus	5½ft.
Tropidonatus Quincunciatus	3ft. 6ins.
Tropidonotus Stolatus	2ft.
Dendrophis Pictus....	4ft.
Dipsas Ceylonensis	3ft. 11ins.
Dipsas Forstenii	5ft. (many grow much larger).
Helicops Schistosus	2ft. 6ins.
Python Molurus	The average adult size seldom exceeds 12 ft., though occasional specimens grow much larger. The appearance of snakes is very deceptive, and though people report that they have seen a Python 20 ft. long, it may, in reality, be only about 12 ft. in length.
Polyodontophis Subpunctatus	17 ins.
Chrysopelea Ornata	3 ft. 10 ins.
Oligodon Sublineatus	10 ins.

After reaching its full length a snake thickens as it grows older.

Trimeresurus Trigonocephalus is a somewhat difficult snake to obtain except in certain localities, as it is essentially nocturnal in its habits. I obtained a good many specimens at Matale, the coolies catching about ten or twelve of them

within three months, but have found it considerably harder to obtain any in other parts of the Island. One specimen, which I kept for nearly two years, became very tame, and grew to a length of three feet. It died eventually from old age. A skin of a Trimeresurus I killed near Matale measured 4 ft. 4 ins. when stretched. A large number of varieties are to be obtained in the Matale district, and during a stay of a year there I killed the following varieties:—Polyodontophis Subpunctatus, Aspidura Trachyprocta, Oligodon Subli-eatus, Lycodon Aulicus, Zamenis Mucosus, Coluber Helena, Dendrophis Pictus, Tropidonotus Stolatus, Tropidonotus Quincunciatus (known in Ceylon as T. Asperrimus), Helicops Schistosus, Dipsas Ceylonensis, Dipsas Forstenii, Dryophis Mycterizans, Dryophis Pulverulentus, Naia Tripudians, Callophis Trimaculatus, Vipera Russellii, Ancistrodon Hypnale, Trimeresurus Trigonocephalus. I found a family of nine "Coluber Helenas" in one antheap

Although I made several attempts to obtain specimens of Bungarus Ceylonicus in that district I was unable to obtain any.

I append a list of the Tamil and Sinhalese names of some common snakes, which may be of some use to those desirous of obtaining specimens in Ceylon.

I had much difficulty in making the list at all accurate, as the native nomenclature of snakes is both incomplete and inaccurate, there being no scientific study of reptiles among either the Tamils or the Sinhalese. What one man will call a "Mapila" another will call a "Karawila," and vice versa; while separate species that resemble each other in colour are given the same name. A native dislikes confessing to ignorance, and if shown any snake will give it a name, even if it is

the wrong one, while the Tamils often borrow the Sinhalese names, and for numerous unnamed varieties use the word "Vyrian" (viper), which corresponds to the Sinhalese "polonga." All this combines to make the discovery of the correct names of snakes a difficult business. The other species of the genera mentioned below are given the same names.

NAME.	TAMIL NAME.	SINHALESE NAME.
Python Molurus ..	Malam Pambu Malei Virian Venanati	Pimbura
Lycodon Aulicus ..	Kundan Karawila ..	Tel Karawila Mapila
Zamenis Mucosus ..	Sarei Pambu	Girendiya
Coluber Helena ..	.. ..	Muda Karawila
Dendrophis Pictus ..	Kumbera Muke (sometimes)	Haldunda
Tropidonotus Stolatus	Kopi Pambu (Coffee Snake)	Aharakuka
,, Piscator	Tanni Pambu (Water-snake)	Diya Polonga
Ancistrodon Hypnale	Nettu Verusa	Mahakamaduwa Kunukatuwa
Dipsas Ceylonensis ..	Kopi Virian..	Dunu Karawila Mapila
Chrysopelea Ornata..	.. ..	Pol-Mal Karawila
Dryophis Mycterizans	Patchi Pambu (Green snake) Kumbera Muke (Horned nose)	Ahatula
Bungarus Ceylonicus	Kundan Karawila ..	Dunnu Karawila Tel-Karawila
Naia Tripudians ..	Nulla Pambu (good snake)	Nagya
Vipera Russelli ..	Kanadi Virian (Spectacle Viper) Podeyen Virian Pambu	Tic Polonga (Spotted Polonga)
Trimeresurus Trigonocephalus	Patchi Virian (Green Viper) Kopi Virian (Coffee Viper)	Palla Polonga
Uropeltidae .. .. Earth-snakes and smaller Colubrinae	Munelei Pambu (Sand-snakes)	Depat Naya (Two-headed snakes)

Chapter VIII.

PROTECTIVE COLOURATION.

Among Serpents, Protective and Aggressive colouration is especially noticeable. The following snakes afford the best examples of advantageous colouration :—

Dryophis Mycterizans.
Dryophis Pulverulentus.
The Lycodons.
Python Molurus.
Vipera Rusellii.
Trimeresurus Trigonocephalus.

In many cases colouration may be both aggressive and protective. For example, the green skin of the Dryophis Mycterizans enables it to harmonize with the green leaves of the trees, and become almost invisible both to the lizards and young birds it preys on, and also to snake-eating birds and other enemies.

The Dryophis Pulverulentus, on the other hand, is a nocturnal snake, and resembles the D. Mycterizans in everything but its colour, which is dark brown. Being nocturnal in habit, a green skin would naturally be useless to this snake when hunting, and as it lives in the brown thatched roofs of houses it would be equally useless to it when asleep in the daytime.

Protective Colouration in Lycodon Aulicus.

Another striking example of protective imitation is the way in which the little Lycodon Aulicus imitates the deadly Bungarus Ceylonicus (Krait). Except for the different shapes of their heads, the two at first-sight are practically indistinguishable. Examination shows, however, that the B. Ceylonicus has enlarged hexagonal vertebral

scales, while the scales along the back of vertebrae of the Lycodons are of normal size, and although both snakes are black, with white bands, the banding is apparent on the ventrals of the Bungarus, and absent on the belly of the Lycodon. To make the deception more complete, the Lycodon has enlarged front teeth, in imitation of the fangs of the Bungarus Ceylonicus, though the former is quite harmless. (The Hydrophobus Nympha also imitates the latter snake.)

These enlarged solid teeth go to prove that the colouration is in this case protective; a protection against mankind, who, taking the snake to be a poisonous Krait, give it a wide berth. It is also, no doubt, safe from snake-eating birds, who leave the Bungarus alone, either because it is unpalatable, or in fear of its bite.

The Colouration of Python Molurus.

The Python Molurus, on the other hand, is aggressively coloured. If it was of uniform colour its immense body would be at once noticeable, but its skin being yellow and black, it harmonises with the "shadow and sun" effect, so noticeable in the jungle. This harmonising yellow and black colouration is noticeable also in the skins of the tiger and leopard. It is somewhat peculiar that the python should be thus coloured, as it is a nocturnal snake, which ambushes its prey at dusk, when, even if it was of a bright uniform colour, it would be invisible.

At the same time the python would hardly require its coloured skin as a protection whilst lying asleep in the jungle, as its sole enemy is man, and the danger it is exposed to is very slight indeed. When young it is liable to attack by the mongoose, but when it is so small as to be able to be killed by the latter, a variegated pattern on its skin is unnecessary, as its body would not be large enough to attract attention, if of a uniform colour.

This colouration seems to point to the fact that the python does not confine its hunting to dusk. but often ambushes its prey before the sun has set, seizing and catching in its coils any deer or other small game that may come down to the water to drink in the evening.

The Viper Russellii is darkly coloured as a protection. Being nocturnal, its colouration would be useless while hunting.

When lying asleep amongst the dead leaves, its brown skin, covered with blackish leaf-shaped markings, renders it almost invisible.

The Trimeresurus Trigonocephalus, a nocturnal snake, found on bushes and trees, is coloured green with black blotches, which break up what would otherwise be too large a stretch of uniform colouration.

Distribution of Colouration.

It can, in most cases, be taken as a rule that nocturnal snakes are protectively coloured, and other snakes both protectively and aggressively coloured. Snakes that are unpalatable to birds and animals that prey on reptiles give warning, and save their own lives, by the colour of their skin.

Other serpents, that are not in any way benefited by the pattern of their skin, often have some other physical advantages to make up for it.

Protective Habits.

Take for example the Rat-snake (Zamenis Mucosus), the Cobra (Naia Tripudians), the Dendrophinae, and the Tropidonoti. The Rat-snake and the Dendrophinae have speed, the Cobra its threatening hood, and the Tropidonoti their ability to flatten their bodies in such a way as to resemble vipers, thereby protecting themselves from attack.

Tropidonotus Stolatus will sit up and expand its neck in much the same manner as the Cobra, and many of the tree-snakes, such as the Dipsadinae and the Trimeresuri, vibrate their tales rapidly when disturbed.

Chapter IX.

SNAKES IN CAPTIVITY.

Those who are desirous of keeping a serpentarium of live snakes should study as much as possible the conditions under which the various snakes live when in their wild state.

The Cages.

The boxes they are kept in should be roomy, and with sand or pebble-covered floors, in which small holes have been bored, to permit of drainage. The sides should be of glass, though in the case of large snakes wire netting may be used. The roof should be made of perforated zinc when the boxes have glass sides. The bottom of the cage-door ought to be on a level with the floor of the cage, as it will considerably facilitate the cleaning of the latter. A pan containing water is necessary, and should be fastened rather high up, as if it is on the floor of the cage the snake is likely to spill it, turn his sand into mud, and by crawling up the inside of the glass make the latter dim and dirty, the cleaning of which, without getting bitten, is a difficult process. If the vessel containing the water is arranged so that it can be raised or lowered by strings passing through the roof of the cage, it will make the renewal of water considerably easier.

Rocks should be placed in all the boxes, to assist in the removal of the skin, when skin-shedding time approaches (often as frequently as once a month), and when tree-snakes are kept, shrubs are necessary.

It should be remembered that the three things that snakes principally require are

(1) Air, (2) Warmth, (3) Water,

and if the cases can be kept out of doors, but sheltered from the rain, so much the better.

Although fond of warmth, snakes do not care for the full glare from a hot sun, and a portion of their cages must be shaded, so that they can protect their eyes, which are lidless.

Water is necessary, for, though a snake eats seldom, it drinks deeply, and takes to the water often in the hot weather.

Skin-shedding occurs about once a month, or every six weeks (according to the amount of rubbing that the epidermis receives). The process is interesting.

Skin Shedding.

About two weeks before shedding its skin the eyes of the snake become dull and opaque, the serpent being almost blind. It remains quiet in the corner of its cage, and refuses food. The skin now loosens on the tail, and afterwards about the jaws and head, finally coming off inside out and rolled up in a ring, complete even to the thin transparent substance that covers the eye. The loosening of the epidermis is due to the formation of minute hair on the skin underneath.

After skin-shedding it is advisable to bathe the snake, or spray it with water, as the new skin is slightly sticky. The shed skin should be removed from the case, as, should it get damp, insects and tics will appear.

The tics bite through the epidermis, and fastening on the skin below, make it very difficult for the snake to cast its skin when the time comes for it to do so. A snake thus afflicted should be rubbed with cocoanut oil and placed in the sun.

Cure for Tics on Snakes.

If the snakes are kept indoors the trouble from tics will be obviated. At the same time it is advisable to place the cages for a short time in the sun, after a long spell of wet weather, in order that the reptiles may renew their supply of electricity

(vitality) from the rays of the sun.

It is noticeable, also, that snakes kept in cool climates, with their room warmed artificially, never show the same amount of vitality and energy as those kept in the natural warmth of an Eastern climate.

When Snakes refuse their Food.

When snakes are first caught they will probably refuse to eat for a long time, owing to fear. This is accounted for by the fact that after a large meal, or when swallowing anything, a snake is necessarily handicapped if subject to attack.

How a Snake eats.

When feeding, a snake usually swallows its prey head-first, so that the fur or feathers may not catch in its throat.

Having seized it, it proceeds to push it down its throat with its teeth, by moving forward first on one side of the jaw and then the other. The snake's teeth curved backwards towards the throat, prevent the prey from escaping. The muscles of the throat also grip the animal and help in the crushing process.

Protrution of Windpipe when swallowing.

While the food is in the snake's mouth the latter protrudes the end of its windpipe to a distance of about twice or three times the pipe's own width, beyond the lower lip, where, opening and closing, it takes in air, and saves the snake from suffocation.

During the process of swallowing the snake curves its body about to assist the muscles in their work of forcing down the food.

This process completed, the snake remains still and yawns prodigiously at intervals, a process which probably helps to exude the salivary fluids, which assist the digestion. After moving about for a short time (probably an additional aid to the digestive fluids) the snake goes to sleep.

If frightened, after having a meal, a timid snake will sometimes eject its food.

Newly-caught Snakes.

A newly-caught snake will often injure its nose by striking at you, and banging the latter against the side of its cage. This is not a serious matter, but should the wound become bad, Condy's fluid may be added to the drinking water. Condy's fluid is preferable to carbolic acid, as the latter is poisonous if taken internally in any quantity.

Small snakes should not be placed in the same cage with large ones, as the latter sometimes show a tendency to cannibalism. Snakes of the same kind may be kept together, if they are about the same size, and pythons may always be kept together, as they only eat mammals and birds, but care should be taken at feeding time to see that they do not both seize the same rat, and accidently swallow each other, as is described further on in this chapter.

Nervous Snakes.

Nervous snakes should be kept separate, as when a snake becomes frightened in any way it will often, in panic, strike at the nearest moving object. Two nervous snakes may thus attack each other, through no feeling of enmity, but through fear occasioned by the sight of a human being, and a desire to strike wildly and blindly at whatever is nearest them.

It is advisable to keep wild and tame snakes together as long as a few of them are quiet, any others that have been newly caught will soon become tame.

The best way of lifting untamed snakes is by holding the tail and supporting the body across a stick.

Keeping Pythons.

Although few people are aware of the fact, young pythons make very good pets. Those unacquainted with snakes are apt to attribute to a young python of some six or seven feet long all the terrifying characteristics of a "Giant Anaconda," some thirty-five or thirty-six feet in length. Some

people are even under the impression that a python will deliberately pursue, catch and make a meal of you. Pythons are easy to tame if caught young, and when they are properly tamed, and have lost their fear of you, will put up with almost any treatment and handling without hissing or striking. These snakes are very hardy, and require little attention. I have been keeping pythons for over two years, and for the last year have had as many as thirteen, and out of all these only one has died —a very old snake, that had been very much cut about by coolies, who saw it in the jungle which they were cutting down.

Feeding Pythons

The amount of food consumed by these snakes varies a great deal with individuals; some eat once a month, some once in two months, according to the size of the snake, the size of the previous meal, the temperature, and the period.

Their food may be composed of chickens or small mammals, especially rats, which seem to be the favourite food of snakes of all kinds. Except for feeding and giving them water, the pythons require little or no attention. They are fond of water, and will often lie in it, though their habits are not so aquatic as those of the "Boas."

Both "Boas" and Pythons kill their prey by constriction. Seizing the animal by the neck, the snake turns it over and, turning a sort of somersault, rolls its coils round it. After the animal is dead, the python salivers over it with its tongue in order to digest it easily, and bringing its coils over, crushes it again as it swallows.

A python's mouth is more expansive than that of any other snake, and it is possible for a young python four feet in length, and, with a normal circumference of five inches, to swallow a chicken with a circumference of ten inches.

The sense of touch and smell possessed by the Snake.

The eyesight of the python is extremely bad in the daytime, and, like other nocturnal snakes, it finds its prey (if fed during the day) by its sense of smell, and by touching with its tongue the ground over which its food has passed. So greatly is a snake dependent upon its sense of touch, that if anyone sees a snake stalking its prey in the jungle they will notice that the serpent will not go straight for the frog or rat, but will follow the track along which the latter has passed, touching the ground every now and then with its flickering tongue, which transfers to the nostrils the smell of the rat. Therefore, when feeding even a tame python, great care has to be exercised lest the snake should seize your hand in mistake for a rat, especially if your hand has just been in contact with the latter.

When a snake has once seized anything in its mouth the action of swallowing is almost purely mechanical, and the serpent is scarcely aware of what it is swallowing, its palate being almost devoid of any sense of taste or feeling.

A curious incident occurred when I was feeding one of my pythons, which bears out this theory.

I had flung a dead rat into the cage, and was moving it about with a bamboo stick, which I afterwards placed near the snake's head. The latter saw something dimly moving and smelt the rat, so it straightway seized and coiled round the bamboo, which it eventually proceeded to swallow. After it had got about two feet of the stick down its throat it discovered its mistake and disgorged it.

When looking over a copy of *Country Side* I came across the photograph of a rug that had been accidentally swallowed by a python and disgorged. The rug was rolled up, with the fur inside, and compressed into the shape of a sausage.

Accidental Cannibalism on the part of a Python.

Several years ago, in the Zoological Gardens in London, a python accidentally swallowed another

python nearly as large as itself. I say "accidentally," as pythons are not given to cannibalism. The keeper placed two pigeons in the snakes' cage, and both pythons seized the same pigeon and started swallowing. The smaller of the two pythons refused to let go his hold on the bird, so his head was swallowed by the other snake. Still feeling something in his mouth, the larger reptile continued to swallow, and the keeper entering the Reptile House shortly afterwards found only one python, and that one very much distended. The meal was digested within a month.

Handling the Python.

In handling the python care must be taken to see that after seizing the reptile behind the head it does not get its coils round its own neck and underneath your hand, as by doing so it can exert sufficient leverage, by an upward pressure, to draw its head down into the centre of its coils. If it should do this, and you do not leave go, you may (if the snake is a large one) get your hand crushed or otherwise injured, as by using its coils as a fulcrum, and your arm as a lever, it can exert a tremendous pull.

This trick of leverage is well known to the snake, and it will often attempt it when held by the neck.

Should a python wind round you, never attempt to pull its coils apart, it is almost impossible (even with a young one). The snake should be unwound by the tail, which is quite an easy matter as far as strength is concerned. A python's strength lies in an ingenious way of applying its coils, and although strong enough to crush a goat, can be managed, to a certain extent, by quite a small child if he knows the secret of the snake's strength and how to counteract it.

Catching the Python.

The python gets its leverage for applying power from its tail. To capture a python it is

merely necessary to take it by the tail. The snake moves slowly, and should it attempt to turn on you, you should walk round so that the body is once more in a straight line, and pull it by the tail (of course it requires a large open space if this method of capture is attempted). By keeping up a slight pull, the snake is unable to turn, as in order to turn round, the reptile has to move its ventrals forward, which act almost like paddles against the ground, and a backward pull naturally counteracts this.

A python should not be allowed to coil round anything from which it cannot be easily unwound. A ten foot specimen of mine once escaped and wound round a beam near the roof. Four men pulled on its tail for twenty minutes without any effect, but I eventually caught it by a lucky grab behind the neck, and by persistent poking the men made it unwind.

Pythons are among the few snakes that ever breed successfully in captivity, and this is due to the fact that they incubate their eggs by coiling round them. Probably this habit is more with an object of protection than for purposes of incubation, as the eggs of the python are large enough to catch the eye of the mongoose and other egg-eating mammals and birds.

The most suitable snakes for taming are those of sluggish disposition, and are not of nervous temperament.

Nocturnal snakes are easier to tame than those that come out in the daytime.

The best snakes for taming purposes are the following:—

The most suitable Snakes for Taming.

(1) Tropidonotus Stolatus, (2) Trimeresurus Trigonocephalus, (3) Python Molurus, (4) Dipsas Ceylonensis, and D. Forstenii, (5) Coluber Helena, (6) Dryophis Pulverulentus, (7) Dendrophis Pictus.

The first three are the easiest to tame, but the pythons must be young ones.

No. 7 is a gentle snake, but, not being nocturnal, is very nervous.

The Green Whipsnake (D. Mycterizans) seldom does well in captivity. It requires a large cage with bushes and shrubs inside. Some specimens I saw at the Peradeniya Gardens, near Kandy, had bred in captivity, and were living on apparently very amicable terms with a Lycodon Aulicus, a Coluber Helena, a Tropidonotus Submineatus, and a Dipsas Forstenii.

The Dryophis Mycterizans.

It is a common belief that the Dryophis Mycterizans strikes at the eye, but this is a fallacy. This snake is supplied with a fleshy appendage on the end of the snout, as owing to its long and slender body, it often misjudges its stroke when striking at anything and overbalances, in which case the appendage protects its pointed nose from injury.

When frightened, this snake opens its mouth and expands its lower jaw into the shape of a square, the muscle joining the ends of the lower jaws being capable of great expansion. I have not noticed this habit in the up-country (hill) variety of Dryophis Mycterizans or in the Dryophis Pulverulentus.

The Rat-snake (Zamenis Mucosus, or Ptyas Mucosus) is a very savage snake and almost untameable. It feeds well, however, in captivity.

Taming Vipers.

Vipers are among the easiest snakes to tame, as they are of sluggish disposition, semi-nocturnal, and not likely to strike in the daytime when once they have got used to you.

They may be tamed either with their fangs in or with their fangs removed. The removal is best done by means of scissors, and the fangs should be cut off high up, so that no dangerous pieces are

left; they cannot, however, be extracted, as they are firmly attached to the maxillary bone.

Wrap your hand in a cloth and allow the viper to strike at and bite you as often as it wishes, but do not irritate it. When it has become tired of striking at you, you can handle it, and the taming is then merely a matter of time. In about five or six weeks the fangs will have grown again, but by that time the taming will be complete, so that their removal will be unnecessary.

With the Opisthoglypha the removal of the fangs is unnecessary, as their poison is so slight, and the grooved fangs, being at the back of the mouth, seldom enter you when they bite.

Nearly all the Ceylon snakes do well in captivity, with the exceptions already mentioned and the Uropeltidae and some varieties of the smaller Colubrinae, Aspidura, Oligodon, Polyodontophis, and Lycodon.

Feeding Snakes on dead animals.

Although it is a common belief that snakes will only eat things that they kill themselves, I find that they will eat dead food provided that not the least decomposition has set in and the animal has not been at all cut about. When first captured snakes show a marked dislike for ready-killed food, but will swallow it when forced to do so by hunger, and when they have once done so will always be ready to take it in the future. The intervals during which a snake can go without food is extraordinary. I have known a python live without food for as much as six months, while a cobra will sometimes refuse food for a month. During these intervals of fasting the snake lives on a reserve supply of fat which surrounds the stomach.

Before skin-shedding a snake will refuse food so as to be able to get its skin off easily, but sometimes instinct gives way to greediness, and I have often had snakes die through eating a large

meal before skin-shedding, and being unable to cast the epidermis they died from suffocation.

Difficulty in Skin casting.

When there is likelihood of a snake being unable to cast its skin all danger of death may be eliminated by just scratching the epidermis with the point of a knife along the ventrals. This causes no pain, as the epidermis when ready for casting is merely a thin substance, something like tissue paper, and contains no nerves. By slitting this open it not only eases the snake, but enables the latter to rub it off easier.

Snakes in the Madras Museum.

When at Madras I saw a large collection of live snakes in the Museum. There were, as far as I can remember, two Naia Tripudians, one Cerberus Rynchops, one Tropidonotus Piscator, one Lycodon Aulicus, one Lycodon Carinatus, one Python Molurus, one Zamenis Mucosus, one Helicops Schistosus, two Vipera Russellii, one Echis Carinata, one Gongylophis Conicus (a somewhat large specimen), several Dryophis Mycterizans, one Bungarus Ceylonicus, one Tropidonotus Stolatus, one Ancistrodon Hypnale, and several other varieties.

The two cobras looked out of condition, and were suffering badly from tics. The other snakes seemed to be doing well, but I do not remember seeing any of striking dimensions. The python was a young one of about eight feet in length.

At the Madras Zoological Gardens I saw a most magnificent specimen of python, and was told by the keeper that it was 27 feet in length, and judging from its thickness his estimate must have been very near right.* These large pythons are not nearly so common as is commonly imagined, and it is seldom that one finds a python in cap-

Large Pythons.

* There is at the Zoological Gardens at Regent's Park a very fine Python Reticulatus of 25 feet.

tivity measuring over twenty feet, though it may be thought to be about thirty feet by those who have not measured it.

Fine Ancistrodon at Peradeniya

When at Peradeniya Gardens (close to Kandy) I saw among the collection of snakes kept by Mr. E. Green, a very large specimen of Ancistrodon Hypnale, which, judging from the size of the head, which was nearly as large as the first joint of a man's thumb, must have been nearly two feet in length. Mr. Green very kindly showed me also a curious bottled specimen of the above snake that had for its tail a short blunt stump, such as may be found among the Uropeltidae.

Chapter X.

THE COMMON BOIDAE, VIPERIDAE, AND COLUBRIDAE OF CEYLON.*

Only one specimen of the Boidae is to be found in Ceylon—the Python Molurus.

Python Molurus.

Head an elongated triangle, 11-13 upper labials, the two in front pitted; 17 or 18 lower labials. Frontal divided by a median line. Two prae-oculars, and three or four post-oculars. Scales in 60 to 70 rows. Ventrals 242-265, anal entire, sub-caudals 60-72. Tail prehensile.

Colour, yellowish or brown, with a vertebral series of large black or brown blotches, supplemented by lateral series of small black blotches. Upper surface of head pink, with a dark "split pointed spear" mark, an offset of the marking on the nape. Ventrals † yellowish and spotted near edges. Grows to over 20 feet, but in Ceylon seldom exceeds 12 feet. It has vestiges of rudimentary hind legs protruding through the skin. The Boidae.

This snake is nocturnal, and is almost blind in the daytime. It is very fond of water, and incubates its eggs by coiling round them. It feeds on small animals and birds.

Although it has not yet been found in Ceylon, the Gongylophis is an interesting snake, and does

* In preparing this chapter I have obtained much valuable information from Mr. Boulenger's volume on "Reptilia and Batrachia of British India."

† Where the colour of the ventrals only is given, the sub-caudals are of the same colour, the colour of the ventrals and the sub-caudals being nearly always uniform.

well in captivity. I therefore append a brief description.

Gongylophis Conicus.

Head triangular, and covered with small scales, 12 to 14 upper labials; scales very strongly keeled; ventrals 168-176; anal entire, and subcaudals 17-24 single.

Colour, light grey, with a dark, wide zigzag pattern along the back, and covering most of the body. Ventrals white. Length two feet.

This snake eats rats and mice, constricts its prey, and in general habits resembles the python, even in its love for water. Visible vestiges of hind legs are found in the male but not in the female. The Gongylophis is found in most parts of India, and snake-charmers often amputate the end of the tail and show the snake as a "two-headed serpent."

The Viperidae.

Vipera Russellii (*Viperinae*).

Head triangular, snout obtuse, nostrils large between three shields, a narrow, supra-ocular shield, head covered with small, strongly-keeled scales, 11 or 12 upper labials, scales strongly keeled and in 27-31 rows, ventrals 163-172, anal entire, subcaudals 45-60 in two rows.

The Viperidae.

Colour, brown, with a black, chain-like pattern along the back, and blotches along the sides, ventrals white or cream-coloured, and often spotted. Length about 4 ft. 6 in. (adult).

The Vipera Rusellii utters a peculiar long-drawn cry at night, which may be of almost any note in the scale. The bite of this viper is very deadly. It is nocturnal and ovoviviparous. A specimen that I kept in captivity bore 22 young; one alive, nine dead, but free from the egg covering, and twelve still in their eggs.

Ancistrodon Hypnale (*Crotalinae*).

Head triangular and distinct from neck, snout much turned up at end, and covered with small scale-like shields on upper surface, one or two post-oculars, one or two sub-oculars, 7 or 8 upper labials, and a loreal pit. Scales slightly keeled in 17 or 19 rows, ventrals 140-155, anal entire, sub-caudals 31-45 pairs.

Colour brown or ash, with large, black, alternating spots along each side of the vertebrae. Upper lip with white line, belly a dust-like brown. Size about 15 inches.

This snake when disturbed will proceed along the ground with short jumps. Its bite is seldom fatal.

Trimeresurus Trigonocephalus (*Crotalinae*).

Head pear-shaped, snout very short, upper portion of head scale covered, internasals very large, large supra-ocular divided in two, two or three post-ocular and a sub-ocular, upper labials 9 or 10, and loreal pit touching second labial, scales smooth or faintly keeled in 17-19 rows, ventrals 147-152, anal entire, sub-caudals 57-67 pairs. Colour bright green, plain, or with black markings, ventrals yellow, end of tail black. Grows to 2 feet 4 inches. Tail prehensile.

A nocturnal and gentle snake, is sometimes found on the tea bushes in estates, and confines itself strictly to certain localities. The bite is seldom fatal.

Colubridae.

Sub-Family Colubrinae. Solid toothed. Harmless. (Many of the uncommon varieties have been omitted.)

Aspidura Brachyorrhos.

Colubridae.

Head not distinct from neck, eye small with round pupil, nasals very small, a single internasal, frontal a little longer than its distance from end of snout, two-thirds the length of the parietals, supra-ocular more than half the length of the frontal, praefrontals in contact with second and third upper labials, separated from the eye by a prae-ocular, two post-oculars; six upper labials, fourth entering the eye, four lower labials in contact with anterior chin shields. Scales in 17 rows, smooth. Ventrals 139-154, anal entire, sub-caudals 27-38, body cylindrical.

Colour reddish brown, with four indistinct, longitudinal streaks, and a vertebral series of black dots. Nape with black cross-streaks. Ventrals yellow. Grows to 14 inches. Found only in the mountains, and is peculiar to Ceylon.

Aspidura Trachyprocta.

Like the above, only it has 15 rows of scales; ventrals 120-147; sub-caudals 13-25 single.

Colour brown or black, with a longitudinal series of small black spots and a dark lateral streak. Ventrals black, or yellow spotted with black. Grows to 15 inches.

Lycodon Aulicus.

Head pear-shaped, bulging out from snout, and slightly distinct from neck, eye small, internasals much shorter than the prae-frontals, frontal shorter than its distance from end of snout, and shorter than the parietals, one prae-ocular, two post-oculars; nine upper labials, 3rd, 4th, and 5th entering the eye, four or five labials in contact with anterior chin shields. Scales smooth, in 17 rows. Ventrals 183-209, anal divided, sub-caudals 57-77,

in two rows. Body cylindrical, or slightly compressed.

Colouration variable ; brown or black above, encircled with white rings, or with white cross bands on posterior half of the body. Ventrals white. Grows to 19 inches.

This snake often lives in houses, where sometimes a colony of six or seven may be found.

Lycodon Carinatus.

Like the above, only it has its scales keeled, and in 19 rows. Ventrals 188-194, anal entire, and sub-caudals 53-64, single.

Colour like the preceding, only in the young the back of the head is white. Grows to 26 inches.

The Lycodon Carinatus is not so common in Ceylon as the Lycodon Aulicus.

Polydontophis Subpunctatus.

Head short, slightly distinct from neck, eye small with round pupil, frontal longer than its distance from end of snout, as long as parietals, or a little shorter ; one prae-ocular, two post-oculars, both in contact with parietal ; nine or ten upper labials, 5th and 6th entering the eye ; four lower labials in contact with anterior chin shields. Scales in 17 rows, smooth. Ventrals 151-220 ; anal divided ; sub-caudals 47-76, double. Body cylindrical. Grows to 17 inches.

Colour pale brown or black, with small black spots along the vertebrae, and also along the sides. Head and neck dark. Two bands across front and back of neck, enclosing broad yellow collar which is itself bisected by a black median line extending to a transverse line between the eyes. Ventrals yellow, with a dot near each outer edge. A pretty little snake, which is almost unmistakeable on account of its yellow collar.

Ablabes Calamaria.

Head short and hardly distinct from neck, eye small with round pupil, single nasal shield, frontal longer than its distance from end of snout, slightly shorter than the parietals, one prae-ocular, and two post-oculars (only upper one in contact with parietal), seven upper labials, third and fourth entering the eye; four lower labials in contact with the anterior chin shields. Scales in 15 rows, smooth (or feebly keeled). Ventrals 130-154; anal divided; sub-caudals 64-76 in two rows. Body cylindrical. Grows to 15 inches.

Colour pale brown, sometimes with two longitudinal lines. Ventrals yellowish.

Simotes Arnensis.

Head short, not distinct from neck; eye small with round pupil. Frontal as long as its distance from end of snout, or a little shorter, a little shorter than the parietals; one prae-ocular, twopost-oculars, seven upper labials, third and fourth entering the eye; four lower labials in contact anterior chin shields. Scales in 17 rows, smooth or faintly keeled. Ventrals 170-202, and angulate laterally; anal divided; sub-caudals 41-59, in two rows. Body cylindrical. Grows to 24½ inches.

Colour pale brown, with thick and distinct black bands. A black band between the eyes, and a black chevron behind, with the frontal as apex. Ventrals yellow, sometimes spotted brown. Grows to 22 inches.

Oligodon Sublineatus.

Head short, scarcely distinct from neck. Eye small with round pupil. Frontal longer than its distance from the end of the snout, as long as, or

slightly longer than, the parietals. Prae-ocular single, two post-oculars ; upper labials seven, third and fourth entering the eye. Four lower labials in contact with the anterior chin shields. Scales in 15 rows. Ventrals 136-159 ; anal divided, sub-caudals 26-35.

Colour pale brown, often with a series of dark spots arranged along the sides in pairs. Head marked dark brown, with transverse band passing through eyes, crossed by a longitudinal band from frontal to end of parietals. Black spot on each side of the neck. Ventrals yellowish, with three series of small black spots, two lines of them being along the edges of the ventrals and one line in the centre. Body cylindrical. Grows to 10 inches.

Oligodon Templetonii.

Much the same as above, except that frontal is much longer than its distance from the end of the snout, and as long as the parietals. Three lower labials in contact with anterior chin shields. Ventrals 135, sub-caudals 21.

Colour, brown, with yellow, vertebral streak, which is crossed by about 18 narrow, dark brown bands, an oblique band below eye, but other head markings indistinct. Ventrals white, with square black spots, both colours being distributed in nearly equal proportion.

Not so common as Oligodon Sublineatus.

Zamenis Mucosus.

Head elongate and distinct from neck. Eye large, with round pupil. Frontal as long as its distance from the end of the snout, as long as the parietals, or slightly shorter ; one praeocular, with a small subocular below, and two postoculars; eight upper labials, fourth and fifth entering the eye ;

five lower labials in contact with anterior chin shields. Scales keeled (often strongly) and in seventeen rows. Ventrals 190-208, anal divided; subcaudals 95-135, divided. Average size six feet six inches, but I have obtained specimens in Ceylon over nine feet in length.

Colour, brown, grey or black, sometimes with a very deep green tinge, body often has narrow black crossbands on the anterior portion and on the tail. Ventrals yellow (low country in Ceylon), or white (up-country in Ceylon). Young are light in colour, and somewhat resemble the Zamenis fasciolatus.

This snake is the largest of the Colubridae (except perhaps the Naia Bungarus, which, however, is not found in Ceylon). It is commonly known as the Rat-snake (Dhaman in India), and is the commonest of Ceylon snakes, being often found in the roofs of bungalows, where it goes to catch rats. Very swift in movement, and extremely savage if hurt or cornered.

Coluber Helena.

Head distinct from neck. Eye moderate, with round pupil. Frontal as long as its distance end of snout, shorter than the parietals; one large praeocular, two postoculars. Nine (sometimes ten or eleven) upper labials, fifth and sixth, or fourth, fifth and sixth entering the eye; five or six lower labials in contact with the anterior chin shields. Scales in 23 to 27 rows, smooth (or feebly keeled). Ventrals 220-265; anal entire; subcaudals 75-94, in two rows. Body elongate and slightly compressed, Grows to between four and five feet.

Colour, light brown with dark crossbands or festoon marks enclosing white ocelli. In the adult the marking is indistinct or absent. It usually has a vertebral series of black spots on anterior part of

the body, and a parallel series of dorsal spots, sometimes with a black, white-edged collar. A vertical black streak below eye, and an oblique one behind it. Ventrals yellowish, sometimes with a few small black spots.

A very gentle snake, with a peculiar habit of encircling and holding its prey in its coils. It does not crush its prey, but merely holds it in this manner while getting its teeth fixed on the head. Unlike the python, it encircles its prey by coiling its body round it, instead of rolling over and round it, as is the case with the Boidae.

Dendrophis Pictus.

Head distinct from neck, and elongate. Eye large, with round pupil. Frontal as long as its distance from the end of the snout, as long as the parietals, or a little shorter; one praeocular, two or three postoculars. Nine or ten upper labials, fifth and sixth, or fourth, fifth and sixth entering the eye; five lower labials in contact with the anterior chin shields. Scales in 15 rows, smooth, with apical pits, vertebrals as large as outer row. Ventrals 167-205; anal divided; subcaudals 110-150, in two rows. Body elongate and compressed. Grows to four feet.

Colour, olive or bronze above, with yellow vertebral band along one-third of the anterior portion of the body. Yellow longitudinal dorsal streaks. Epidermis (between the scales) bright blue near neck. Black streak from eye to lip, which is yellow. Ventrals yellowish or pale greenish.

A timid and swift-moving snake, found on trees and bushes.

Tropidonotus Ceylonensis.

Head distinct from neck. Eye moderate or

rather large with round pupil. Frontal longer than its distance from end of snout, as long as the parietals; two praeoculars, three postoculars; eight upper labials, fourth and fifth entering the eye; four lower labials in contact with the anterior chin shields. Scales in 19 rows, strongly keeled (except sometimes the outer row). Ventrals 133-141; anal divided; subcaudals 48-54, in two rows. Body cylindrical. Grows to eighteen inches.

Colour, brown, with black crossbands and large black-edged ocelli along the back (indistinct in adult). Black band on each side of head behind eye, and oblique band on each side of nape and the space between yellow. Ventrals uniform yellowish, sometimes anterior portion powdered brown.

Tropidonotus Piscator (Quincunciatus). Known in Ceylon as T. Asperrimus.

The same as the above, except that the eye is smaller. It has one praeocular; nine upper labials, five lower labials in contact with anterior chin shields. Ventrals 125-158; subcaudals 64-90. Grows to three feet six inches.

Colour variable; usually with dark spots arranged in rows of five, separated by a white network, and often invisible on the posterior part of the body; sometimes the spots are replaced by white cone-shaped bands arranged along the vertebrae, on which their apices are. Head marks the same as in the preceding variety. Ventrals white or pale pinkish.

The common "water-snake" of Ceylon. Very numerous in paddy fields. Savage.

Tropidonotus Stolatus.

Same as T. Quincunciatus, only eye moderate. Frontal as long as the parietals; eight upper

labials, third, fourth and fifth entering the eye; sometimes six lower labials in contact with the anterior chin shields. Ventrals 125-161; subcaudals 50-85. Grows to two feet.

Colour, brown, with black crossbars intersected by two longitudinal yellow lines. Ventrals white, often with a black spot at the edge of each. Nape red during breeding season.

Not so aquatic as T. Piscator. A very gentle snake.

Helicops Schistosus.

Head slightly distinct from neck. Eye moderate, with round pupil. Frontal much longer than its distance from end of snout, shorter than the parietals; one prae, two or three postoculars; eight or nine upper labials, third and fourth or fourth and fifth entering the eye; four or five lower labials in contact with anterior chin shields. Scales more or less keeled in 19 rows. Ventrals 129-151; anal divided; subcaudals 55-85 in two rows. Body stout and cylindrical. Grows to two and a half feet.

Colour, dark brown, sometimes with small spots along the back. Dark crimson streak along last rows of scales on each side. Ventrals yellow.

A very common snake, often found in rivers and streams in Ceylon.

Dipsadinae. A sub-family belonging to the back-fanged order. Slightly poisonous.

Dipsas Ceylonensis.

Head spade-shaped and very distinct from neck. Eye vertically elliptic and shorter than snout. Internasals shorter than praefrontals. Frontal longer than its distance from end of snout,

and slightly shorter than parietals; one or two praeoculars reaching upper surface of head; two postoculars; eight upper labials, third, fourth and fifth entering eye; four lower labials in contact with anterior chin shields. Body strongly compressed. Scales in 19 or 21 rows, slightly slanting; vertebral scales much enlarged, nearly as broad as long in middle of body. Ventrals 214-249; anal entire; subcaudals 90-117. Tail prehensile.

Colour, brown, with black heart-shaped marks, sometimes terminating in dorsal streaks, along the vertebrae. Black blotch or bars on neck, a dark streak from eye to eighth upper labial. Ventrals yellowish and dotted brown. Grows to four feet three inches.

This snake is nocturnal, and is often found in the thatched roofs of houses. Being of the back-fanged order, it is only slightly poisonous. It becomes very tame in captivity.

Dipsas Barnesii.

Resembles the above, but has eye as long as snout; three praeoculars, fourth and fifth upper labials entering eye. Scales in 19 rows, hardly oblique, vertebrals slightly enlarged. Ventrals 220, and subcaudals 99. It grows to 21 inches.

Colour, greyish brown, with lighter black-edged transverse spots, black dorsal spots, black band behind the eye, and labial suture blackish. Ventrals white, powdered brown.

Dipsas Forstenii.

Very much like Dipsas Ceylonensis, but has eye as long as snout. Frontal longer than its distance from end of snout; sometimes three postoculars; eight to eleven upper labials, third, fourth, fifth, or fourth, fifth and sixth entering

eye; three or four lower labials touching chin shields; vertebral scales feebly enlarged. Ventrals 259-270; subcaudals 106-131.

Colour, brown, rarely reddish, with angular crossbars, but other features are the same as in Dipsas Ceylonensis. Grows to four feet ten inches.

Dryophis Mycterizans.

Head triangular and very elongate, distinct from neck, and with a dermal appendage at end of snout. Eye large, with horizontal pupil. Frontal as long as the parietals, or a little longer; two praeoculars, a small sub-ocular, and two post-oculars; eight upper labials, the fifth entering the eye; four lower labials bordering chin shields. Scales in 15 rows. Ventrals 172-188; anal divided; subcaudals 140-166 (in two rows). Body elongate and compressed.

Colour, bright green, with black chevrons on the epidermis. Yellow lines along the edges of the ventrals, which are pale green. Grows to four feet eight inches (up-country) and five feet ten inches (low country).

This snake is found on trees and shrubs. Although belonging to a nocturnal family, it is often seen out in the daytime. When alarmed the snake has a habit of opening its mouth and stretching its lower jaw into the form of a square, which gives it a most threatening appearance.

The up-country (hill) varieties are much smaller than the low country ones. Of the two hill varieties, one has green ventrals and the other dark red ones.

Dryophis Pulverulentus.

Same as the above, only it has 182-194 ventrals, 154-173 subcaudals.

Colour, grey, powdered brown.

More nocturnal in its habits than Dryophis Mycterizans.

Chrysopalea Ornata.

Head elongate and distinct from neck. Internasals nearly as long as praefrontals, only much narrower. Frontal bell-shaped, and nearly as long as its distance from end of snout, as long as the parietals, or slightly shorter; one prae and two postoculars; nine or ten upper labials, fifth and sixth, or fourth, fifth and sixth entering the eye; five lower labials bordering chin shields. Scales in 17 rows. Ventrals 204-236; anal divided; subcaudals 118-138. Body slightly elongate and compressed. Grows to about three feet ten inches.

Colour, black, with large red flower-shaped spots along the back, and each scale spotted yellow. Ventrals yellow, head black, with yellow bars.

Another variety also is found in Ceylon:— Pale olive, with black transverse bars, a black spot at the edges of each ventral.

Found among cocoanut trees, but is rather rare.

Sub-Family Elapinae. Anterior maxillary teeth grooved. Poisonous.

Bungarus Ceylonicus.

Head round and scarcely distinct from neck. Eye small, with round pupil. Frontal a little longer than broad, sometimes as long as its distance from end of snout, much shorter than parietals; one praeocular; two postoculars; seven upper labials, third and fourth entering the eye; three lower labials in contact with anterior chin shields. Scales in 15 rows, smooth; vertebrals enlarged, hexagonal and broader than long. Ven-

trals 224-235; anal entire; subcaudals 35-40 single. Body round, tail cylindrical. Grows to three feet.

Colour, black, encircled white. Back of adult sometimes with white blotches instead of rings. Ventrals white, banded black, as in the cobra; ventrals of young uniform white.

A very poisonous snake, which is not often met with in Ceylon, except in certain localities.

Naia Tripudians (Common Cobra).

Head slightly distinct from neck. Eye small, with round pupil. Internasal in contact with the praeocular. Frontal as long as its distance from the nostril, or a little shorter, much shorter than the parietals; one praeocular and three postoculars; seven upper labials, third and fourth entering the eye; four lower labials in contact with anterior chin shields. 23 to 27 scales across the neck, 19 to 23 across the centre of the body. Ventrals 170-206; anal entire; subcaudals 49-75, double. Body cylindrical, and neck dilatable to a great extent. Grows to five feet two inches.

Colour, very variable. Ceylonese varieties are mostly grey, brown, black, and sometimes rusty coloured, almost always flecked with white or light yellow, and have faint white chevrons on the epidermis, with the vertebrals as their apices. Neck with an inverted white spectacle pattern, edged black, and often on a pinkish ground, This pattern may sometimes be incomplete, or even absent. Ventrals white, with broad black bars.

This snake is the commonest deadly snake in Ceylon. It can be distinguished from all other snakes by the presence of a small wedge-shaped scale lying between the lower labials and the mouth. The hood of the cobra measures about one inch in width to every foot of the snake's length. The cobra can erect its body to the height of about one-third of its length.

Chapter XI.

SOME LEGENDS AND STORIES ABOUT SNAKES.

The Python. A Burmese Legend.

The Python Reticulatus is said to have once been a "plain-skinned" snake, but it got Eve to weave patterns on its back.

This reptile was at that time so poisonous that if it bit even the footstep of a man, the man died. The Python, however, was not quite sure of its deadly power, so it bit the footprint of a man, and asked a crow to follow the latter, and see whether he died. So the Crow followed the man, and eventually came to a village where the funeral of the dead man was taking place, and where there was much noise and beating of tom-toms, as is the custom at an Eastern funeral.

The Crow, under the impression that the people were holding a festival, returned to the Python and told him that the man could not have died, as there was much noise and rejoicing in the village.

This so annoyed the Python that it climbed a tree, spat out all its poison, and became harmless.

The other reptiles then came and licked up the poison, but the Python made them promise only to use their venom under provocation. The Cobra promised that it would bite only when it had been provoked seven times in one day. The water-snakes and frogs refused to promise, and said they would bite whenever they wished, so the Python drove them into the water, where, their poison being washed away, they became harmless.

The juice of the tree from which the Python spat out its poison is used to this day by the natives of Burma for poisoning their arrows.

The following legend is very popular with and fully believed in by the Singhalese: The Naga-Stone.

A certain cobra goes at night to the place where it is accustomed to hunt, and ejects from its mouth a phosphorescent stone, or jewel, which attracts the frogs and lizards, in the same way as a candle attracts moths and flies. The cobra then eats as many of them as he requires.

Cobras containing this stone are reported to be very rare indeed, and unusually large and savage. The "naga" stone is said to be obtainable in the following manner:—

"When a cobra, supposed to possess such a stone, has been discovered, find out its hunting ground and strip the bark off a tree near by. Then go at about one o'clock in the morning, taking a basket of manure with you. When the snake has ejected the stone and withdrawn in pursuit of frogs, fling the manure over the jewel and climb the tree. On its return the cobra will be unable to find the stone, its light being hidden under the manure. In fury the snake will try and climb the tree after you, but will be unable to do so owing to the absence of the bark. At daybreak the cobra may go away, in which case the stone may be taken, and will bring good luck. If, however, the snake dies on the spot the stone will bring misfortune."

The cobra might be called "the patron saint of Buddhists," to such an extent is the snake deified by the latter, and its image frequently occurs in old stonework, brasswork, paintings, prints, and carving, often in the form of a five-hooded deity. The Reverence of the Sinhalese for the Cobra.

In many representations of Buddha a cobra is shown in the act of sheltering him from the rays of

the sun, with its extended hood.

A common belief is that if a man steps on a cobra, the latter will look at him. If the man is blind, the snake will not hurt him, but if the man can see, it will at once bite him.

The Singhalese do not attribute to the cobra the malicious and aggressive nature so often given to it by Europeans. They regard it rather as a symbol of justice. A protecting genius to those who treat it well, but a symbol of death to those who maltreat it. But apart from the supernatural powers they endow it with, their idea of the nature of the cobra is very accurate.

But whereas they regard the cobra as a symbol of justice, they consider the Russell's Viper (Tic Polonga) as a personification of a devil. The following legend gives a very good illustration of their convictions in this respect:—

The Cobra and the Russell's Viper (Tic Polonga).

"A small child allowed a cobra to drink out of her chatty. When going away the cobra met a tic polonga. The latter asked the cobra where it could find some water to drink, as it was very thirsty. The cobra replied: 'There is a child not far from here, with a chatty of water, who will give you a drink, only if I tell you whereabouts she is, you must promise not to bite her.' The polonga promised, and the cobra directed it to the child.

"The viper went, and having drunk from the child's chatty, bit the child. The cobra, however, had mistrusted the viper, and had followed it, to see whether it kept its promise. By sucking the poison from the wound the cobra saved the child's life, and afterwards killed the viper; the cobra being unusually virulent, having the viper's poison as well as its own in its system.

"Ever since there has been enmity between the cobra and the tic polonga, and the former has always been able to swallow the latter."

The Singhalese believe that great fights occur between the cobra and the Russell's viper, but I have never known of a case myself, though I have kept cobras and Russell's vipers together in the same box. There is, however, in the Madras Museum a bottled cobra, killed in the act of swallowing a Russell's viper thicker than itself. I have never before known cobras to show cannibalistic tendencies, except in the case of small varieties of snakes.

Enmity between the Cobra and the Russell's Viper.

There is also a belief that the "Mapila" (Lycodon Aulicus) kills people by sucking away their blood, in much the same manner as a leech, and that they are always found in sevens. As a matter of fact, the Lycodons are often found living together in a colony in one house. When killed the body of the "Mapila" is burned by the natives, to prevent the remaining six from turning up.

The Singhalese name given to the Tropidonotus Stolatus (and applied sometimes to the Ancistrodon Hypnale) means "Death by the roadside," and their idea is that this snake is so deadly that after biting a man, it hurries out of the way to prevent the dead body of the person bitten from falling on it.

When looking over a copy of the magazine "Once a Week," dated 1861, I came upon the following extract from an essay on Serpents, written in the year 1741, by Charles Owen, D.D., which I reproduce:—

Account of Serpents, written by Charles Owen, in 1741.

"*Serpents, you will be good enough to remember, are of three kinds, the Terrestial, the Aquatic, and the Amphibious. There be some with legs and some without; some viviparous and some oviparous; some carniverous and some vermivorous, feeding upon worms and other reptiles in the summer time. In winter time they all live upon air.* . . . .

" . . . . *In Norway are two serpents of very*

large proportions. One is 200 *feet long, and lives in rocks and desolate mountains near the sea about Bergen, which in summer nights ranges about in quest of plunder, devouring lambs, calves, swine, and other animals that fall in its way. In a calm sea it ransacks the superficies of the water (being thus clearly of the amphibious division) and devours the polypus and all sorts of sea-crabs. . . .*

" . . . Upon the approach of a ship, this serpent lifts up its head above the water and snatches at the mariners, and rolls itself about the ship, the more effectually to secure its prey.

" The Hemorrhus is little in body, but terrible in its executions, for when it wounds any person the blood in his body flows out at all the apertures of it, which is immediately followed by convulsions and death.

The Attaligatus is a small, slender serpent, not exceeding in size the quill of a goose; not poisonous in nature, but very mischievous, for these little creatures are one united body, and live in community and never separate. They are a society without schism, which is more than can be said of all human societies, civil or ecclesiastic. When these small, harmonious reptiles go abroad, they travel in company 100 *strong or more, and when they find any asleep they immediately seize the body, and with a force united and irresistible, they devour it."*

Possibly the " small slender serpents " referred to above were leeches. Owen also makes mention of other snakes ; " the Acontia, which springs upon its prey from beneath bushes, after turning itself rapidly round and round on the ground in order to obtain the rotary motion for his flight, that alone insures accuracy of aim. It brings down men at twenty cubits distance "—a certainly novel and somewhat ingenious way of " striking." On the other hand, " the Paubera secures prey by means of a hook fastened to the end of its tail, and

swallows oxen alive and entire." The "Paubera" was apparently a disciple of Isaac Walton. As a matter of fact, the snake referred to was probably a Python, and natives of the East still believe that it uses its tail as an aggressive organ.

Mention is made also of a thirty-foot snake in Brazil, presumably the Giant Anaconda.

There is a common belief among the Sinhalese and Tamils that the Rat-snake (Zamenis Mucosus) is a very low caste snake, and when once a man has been bitten by it no other snake will bite him. They also believe that the Russell's viper is the young of the python.

An account of Snakes in Ribiero's "Ceilão," 1685.

An interesting account of the poisonous snakes of Ceylon is to be found in Ribeiro's "Ceilão," written in the year 1685, which interesting history has recently been translated into English by Mr. P. E. Pieris. Ribiero's account is as follows:

"*There are also four kinds of venomous snakes; one is always found in warm, marshy places, and is about two palms in length, of a brown colour, with a wide belly*" *(probably Russell's viper ?)*. "*When they bite anyone the patient cannot shake off a fearful and deep slumber, in which he dies in the course of six hours unless relieved by remedies. There is another kind, the bite of which renders the patient mad, but it is possible to save him if assistance is given within twenty-four hours. There is a third kind, which is still more terrible; whenever they bite a man the poor patient's blood pours out from all the openings in his body, and when he reaches this condition he is beyond remedy. There are others, again, which are called the Cobra de Capello; although these are very poisonous, no Chingala will kill them, or consent to their being killed if he can help it. They assert that these are the queens of the others, and that they do not bite anyone unless they are offended; and also that if any man kill one its mother, father or sister would take vengeance for the death, and*

they are so possessed with this idea that if one were to bite their wife or child once or twice they would not do it any injury, but only summon it by means of a charm and reprimand it; the consequence is that they kill the more, There is still another class of snakes, the description of which would appear like a fable. I would myself not mention it, had not the truth of it been vouched for by a prominent man born in the island itself, and very well acquainted with everything in it; for although the report is persistent it is impossible to believe it. I refer to my comrade, Gaspar Figueira de Cerpe. This snake is of the thickness of a top-string. Its length is three palms and its colour brown" (Dryophis Pulverulentus ?). "It places itself on a branch, and as a bull, buffalo, wild boar, elk, elephant, or any other animal passes below so that it can touch it, the bones, nerves, and the flesh of the part through which the venom passes rots to the thickness of the snake's body, leaving, however, the skin on the outside intact and in its usual state, but the animal remains there, but has not the power to move, and when they opened some of these animals to find out what was the matter, they discovered such were its effects. The same ill-luck befel a Chingala, and he lived for some years in this fashion without being cured, but they do say that these snakes are not numerous. There are others of a green colour, of the same length and thickness as the former. These, too, lie on branches, and as a man or animal passes by, they pick out their eyes." (Probably Dryophis Mycterizans, whose "eye-pecking" propensities are believed in to the present day.) "Another kind, which they call the mountain snake" (Python ?), "will swallow up a heifer or a stag, and some of these animals I have seen when killed by our Caffres, who eat the flesh, and say that it is very tasty and nourishing. Each slice had a thickness exceeding one palm. And the meat was very white, with scales like a whiting."

Appendix.

THE EFFECT ON SNAKES OF ELECTRIC LIGHT.

The various experiments I have made with snakes in Ceylon have led me to believe that cold is not so injurious to these reptiles as is commonly believed, but that it is the infrequency of the sun's rays that renders a climate such as that of England unsuitable for serpents. It is electricity that the snake requires, and this is obtained from the sun's rays in a tropical climate. In a cold climate the artificial heat in a Reptile House is, I believe, unnecessarily excessive, the temperature being often considerably higher than the average heat of a tropical jungle. Much of this excessive artificial heat, which seems to make the reptiles unusually sluggish, might, I believe, be successfully exchanged for electric light.

Extraordinary as the above statement may sound, I found from the numerous experiments I made, that while snakes withdrew from any artificial heat introduced into their cages, they showed no objection to lying beneath the rays of electric light, though they usually kept their heads in a dark corner of the cage to protect their eyes.

The after effect of the rays was an increase in activity on the part of the snakes.