SNAKES
OF
INDIA

CAZALY

THE COMMON SNAKES

OF

INDIA AND BURMA

AND HOW TO

RECOGNISE THEM

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PREFACE.

AN explanation and even an apology would seem to be required for this little book. The latter especially, since I have not any very extensive or scientific knowledge of snakes and nearly all my information has been derived from other books. I have made no new discoveries; all that is original is the arrangement of the facts.

So much for the apology. The explanation and justification lie in the fact, that I think most people, when a snake is killed, like to be able to tell what sort it is; or at any rate whether it is poisonous or not.

I had this desire so strongly when I first came to India that I bought Dr. Nicholson's book on "Indian Snakes," and later on welcomed the publication of Major Wall's book on "Poisonous Indian Snakes."

From these books I have found it possible to identify all the snakes I have come across. But Wall's book deals only with poisonous snakes and Nicholson is so comprehensive that it takes a lot of time and hard work for the ordinary man to find what he wants.

I gradually simplified matters for myself by making notes, classifying, separating rare snakes and "solitary museum specimens" from the common ones, and so on, until the present little work is the result.

In it I have endeavoured to use only simple language and English names as far as possible; and I have dealt only with the commoner snakes found in India and Burma, snakes such as the ordinary dweller in cantonments or district officer is likely to come across. There are numerous others, but so far I have only come across one that is not mentioned in this book, so I infer that the rarer snakes are not often met and need not trouble the ordinary person, who should be able to identify easily any snake he comes across and, even more easily, to tell a poisonous from a non-poisonous one by means of this book.

The scientific names are taken from Mr. Boulenger's Catalogue of British Museum Snakes: the English names are from Dr. Nicholson's book or are names in Major Wall's writings.

It is curious, by the way, that although the term "Grass Snake" is frequently heard, I have been unable to find out to what particular snake (if any) it refers.

I have always found that coloured pictures of snakes were practically useless in identifying specimens, so I do not regret their absence in this little book.

I freely acknowledge my indebtedness to the books of Dr. Nicholson and Major Wall, and advise anyone who wishes to pursue the subject a little further to get them, especially the latter.

I have also consulted Mr. Boulenger's Catalogue of Snakes in the British Museum, and am indebted to Captain H. W. Acton, I.M.S., for many useful hints.

My thanks are due to Captain D. G. Cooper, I.M.S., for drawing the diagrams.

CHAPTER I.

THE SNAKE'S PLACE IN NATURE.

In order to recognise any given snake it is not sufficient to say "This is a ground snake or a rat snake, etc." Such a statement conveys little or no information. We must first realise the snake's relation to other living things and then the various snakes' relations to one another. This we do by a process of classification.

As everyone knows, living things are divided into two kingdoms—the animal kingdom and the vegetable kingdom.

The animal kingdom is again divided into two sub-kingdoms, *viz.*, animals with back-bones (the vertebrates) and animals without back-bones (the invertebrates). The latter sub-kingdom we need not mention further. It contains the insects, crabs and lobsters, jelly-fish, microbes, and so on.

The back-boned animals or vertebrates are divided into three sections, *viz.*, the fish-like animals, the lizard-like animals and the mammals. The first section contains two classes, *viz.*, the fishes and the amphibians (things like frogs, etc).* The third section we are all familiar with because it contains ourselves, dogs, horses and in fact all animals which have their young born alive and suckle them.

The second section chiefly concerns us at present. It has two classes, *viz.*, the reptiles and the birds. Look at a bird's eyes and scaly legs and you will understand how it comes to be classed with the lizard-like animals.

The reptile class is divided into four orders: one of which is the order snakes. The other three are the tortoises, the lizards and the crocodiles.

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*These animals spend the first part of their lives in the water and then are just like fishes.

So now we have an idea of the relation of snakes to other living creatures.

To present this clearly we may make use of a table of the sub-kingdom vertebrates as follows :—

Section.	Class.	Order.
Fish-like animals (Ichthyopsida).	Fishes.	
	Amphibians.	
Lizard-like animals (Sauropsida).	Reptiles	Tortoises.
		SNAKES.
		Lizards.
		Crocodiles.
	Birds.	
Mammals (Mammalia)	Mammals.	

The order snakes, like all other orders, is divided up into families ; each of these families is divided up into genera and finally each genus is divided into species. The scientific name of any animal, or plant for that matter, is the name of its genus followed by that of its species.

However, in this little book we shall not go into the matter of dividing up the order snakes into families. The subject is rather a difficult one and involves the use of a lot of long names and the classification is not of much use to the ordinary reader as it is based almost entirely on obscure differences in the bones of the head.

So all I have done is to divide up the snakes into four easily distinguished groups (*vide* Chapter IV) according to the idea suggested by Major Wall in his book.

Wherever possible I have given each snake its English name and have appended the scientific name as well, to make reference to other books easy.

CHAPTER II.

DESCRIPTION OF A TYPICAL SNAKE.

Let us now take an ordinary, common snake, such as a cobra or dhaman and thoroughly examine it.

We will not trouble about its inside except to note that the skeleton consists of a skull, back-bone and ribs. The latter are interesting as it is by means of their movements that the snake progresses along the ground. In the cobra the ribs of the neck are long and lie in a line with the body, but they can be stretched out at right angles, thus forming the well known hood. A few other snakes possess this characteristic, but not in such a marked degree as does the cobra.

If we consider the skin of a mammal, we shall notice that it grows fur or hair. A bird's skin is clothed in feathers. Similarly a snake's skin is covered with scales.

We must study these scales carefully as they are the chief means by which we shall recognise the snake.

First examine the head. Here the scales are quite different to those on the rest of the body. They are large, regular and of definite shape and are called shields.—(Figs. 1, 2 and 3.)

These shields all have names, rather long names some of them, but it will be as well to master them.

We will consider them in four groups : (*a*) on the crown (Fig. 1), (*b*) on the upper lips (Fig. 2), (*c*) between the crown and the lips, *i.e.*, the face (Fig. 2) and (*d*) on the lower jaw (Fig. 3).

In the middle of the crown (Fig. 1) is a single shield called the frontal. In front of this is a pair of shields named the præ-frontals. In front of these again is another pair—the inter-nasals and lastly, there is another single shield called the rostral which forms the muzzle of the snake. It has a little notch in it to enable the tongue to be protruded without the mouth being opened. Behind the frontal shield there is a pair known as the parietals.

Looking at the side of the head or face (Fig. 2) we shall at once notice the nostril and the eye with shields grouped about them.

In front is the nasal shield, sometimes single with the nostril piercing it, but generally double, with the nostril between the two. Surrounding the eye, we have the supra-ocular shield above it, the præ-ocular in front and the post-ocular behind it. Sometimes there is a sub-ocular beneath it but not often. These shields are often double or triple.

Between the nasal and the præ-ocular are generally one or more shields called the loreal. But the loreal is absent in many kinds, *e.g*, the cobra and the krait.

Behind the post-oculars are a few more shields called temporals.

Forming the upper lip of the snake (Fig. 2) are a series of shields called the supra-labials. They vary in number from four or five to about nine. One or more enter the orbit when there is no sub-ocular. In the diagram there are seven supra-labials and Nos. 3 and 4 enter the orbit.*

Now looking at the under part of the head, *i.e.*, the lower jaw (Fig. 3); in front we notice a single shield corresponding to the rostral. This is called the mental. From this the infra-labials run back on either side forming the lower lips of the snake.

Between the two series of infra-labials are two pairs of shields known as the anterior and posterior sublinguals or chin shields respectively.

Note that in counting the infra-labials the last shield which touches the posterior sublingual is the last infra-labial. In the diagram there are seven infra-labials.

This completes the normal head shielding and with the help of the diagrams it should not be difficult to understand.

Now turn the snake over on to its back and look at its belly (Figs. 4 and 5). Here we shall see shields of a different sort. They are broad, transverse plates extending right across

* In the descriptions of snakes which follow the number of supra-labials is given and those which enter the orbit are added in brackets, *e.g.*, "Supra-labials 7 (3, 4),"

the belly so that when we have the specimen fairly on its back we can only just see part of the last row of the other scales (Fig. 4). These shields are called *ventrals* and they extend from the posterior sublingual shield of the head all along the body to the anus or vent. Beyond this we are dealing with the snake's tail and the ventrals are now called *sub-caudals* (Fig. 5).

The last ventral shield is called the *anal* shield (Fig. 5). It is generally double and so are the sub-caudals. The latter are divided down the centre by a zigzag line.

The number of ventrals and sub-caudals, though very variable within limits, is most important ; for it is one of the ways in which we differentiate snakes.

Lastly, we will put the snake on its belly again (Fig. 6) and see that the rest of its body is covered with small scales.

These scales are arranged in regular rows, varying in most snakes from about 13 to 25 longitudinal rows. The scales are generally all of the same size. It is most important to ascertain the number of rows of scales that a snake has, and we do this by counting the rows transversely.

The most convenient way to do this is to start at the extremity of a certain ventral and follow the line of scales right over the body to the extremity of another ventral. Notice that the row does not go over exactly at right angles to the body but slants considerably (Fig. 6).

The rows should be counted at a distance from the head equal to about a quarter of the length of the body.

The number of rows is practically always odd, so that there is a single row down the middle of the back called the *vertebral* row (Fig. 6). (Don't confuse this with the ventral shields.)

Besides the number of rows there are two or three other points to be noticed about the scales. First, are they all of

the same size? They generally are, but some snakes have the *vertebral row enlarged* (Fig. 7), notably the krait; and, secondly, notice whether the scales are smooth or whether there is a raised keel along the centre of each scale.

We may also notice whether the scales merely touch one another or whether they more or less overlap, when they are said to be imbricate.

Now a few words about the shape or form of snakes generally.

The head may be narrow and elongated or broad and stumpy. Moreover it may be quite distinct from the rest of the body, being separated by a sort of neck; or there may be no neck so that the head is not distinct.

Some snakes have elongated, slender bodies, others stout heavy ones.

And in some the tail is short and stumpy, in others very long, or tapering away into a fine, minute point.

The size of the eye varies too. Some snakes have large eyes, others small and others again moderately sized ones. The coloured part of the eye or iris varies; in some it is black, in others green or golden. When it is black the shape of the pupil cannot be made out but the pupil also varies; in some being round, in others a vertical or horizontal slit.

The nostrils are generally on the side of the face, but in the water and sea snakes they are on the crown of the head and are then said to be "superior."

Let us now study the teeth of snakes.

We will deal first with the teeth of harmless snakes.

There are altogether six rows of teeth—two rows in the lower jaw and four in the upper. These consist of a row of teeth on each side of the mouth in both the upper and lower jaws. These four rows may be called, for convenience, the upper and lower *marginal* rows. In addition to these, in

nearly all snakes, there is a double row of teeth along the roof of the mouth. These are the *palatine* teeth. They always form the longest rows.

The teeth are small and sharp, very like those of a fish. They are not always of the same size; sometimes the front teeth and sometimes the back ones are longer than the others. They are always directed more or less backwards so that the snake may hold its prey more securely.

The teeth of the poisonous snakes differ considerably from those of the harmless ones.

The *upper marginal row* of teeth does not exist. Its place is taken by the poison fang.

In poisonous colubrine snakes, *e.g.*, the cobra, the fang is more or less fixed, curving backwards and fitting into a depression in the lower lip.

In the vipers the poison fang is much longer than in the cobra. Its length however is apt to be exaggerated; it rarely exceeds half an inch even in the largest specimens of vipers. Still, it is too long to be received into a depression in the lower lip like that of the cobra. So there is an arrangement by which, when the mouth is shut, the fang can be made to lie down along the roof of the mouth. When a viper opens its mouth to bite the long fang becomes erect, sticking out almost at right angles to the upper jaw.

The fangs both of cobras and vipers have a small canal in them through which the poison from the poison gland is injected into the wound made by the fang. In fact the fang of a large viper is very much like the needle of a hypodermic syringe, through which a doctor injects drugs under the skin. The canal in the cobra's fang is a good deal smaller than that in the vipers but answers the same purpose.

The last point to consider is the colouring of snakes.

Many people try to rely entirely on the colour of a snake to identify it. Now although the colour is very

important it is often a fallacious guide so that all the other points should be considered first.

The colour resides chiefly in the scales but the skin is often coloured too and this shows up between the scales, forming what is known as the interstitial colour. The margins of the scales may be coloured differently to the scales themselves. In fact a scale may be of several different colours just like a bird's feather may. All sorts of complicated patterns are thus produced—stripes, dots, ring-spots, ocelli or "eyes," transverse and longitudinal lines and bars, etc. Hence it is very difficult to accurately describe in words or to paint a snake's colouring. In fact coloured pictures of snakes are, I find, of very little use in identifying an unknown snake. Still there is generally a main ground colour and some fairly definite sort of pattern so that, although it may be difficult to imagine a snake from its written description, still with the specimens before one it can generally be recognised from its description. All the same, colour is a variable characteristic and should never be relied on alone to identify a snake.

CHAPTER III.

VARIATIONS FROM THE TYPICAL SNAKE AS JUST DESCRIBED.

As we saw in the last chapter the typical snake is covered with comparatively small scales on its body, shields on its head and ventrals on its belly.

But there are certain variations from this typical arrangement which we have to study.

Turn a typical snake over on to its back and we have seen that the ventrals are transverse plates extending right across the belly (Figs. 4 and 5). But in some snakes the ventrals are much narrower than this. So that as the snake lies on its back we can see the whole of the last row and generally several rows of the ordinary scales on each side of

the ventrals (Fig. 8). These are snakes with *narrow* ventrals, as opposed to the typical snake which has *broad* ventrals.

Again some snakes have no ventrals at all. The belly and the back are covered with identical small scales.

In another group of snakes again the normal head shields are wanting and the snout and crown are covered with small scales just like the back of the snake (Fig. 9). These are snakes having scaly heads, not shielded heads, as the typical snake has. Some of these scaly-headed snakes have one or more small shields, *e.g.*, a supra-ocular or nasal; and the labials can be made out as a rule; but they can be seen at once to be quite different from the snake with a normally shielded head.

All snakes are covered with scales, but these variations in the different kinds of scales on head and belly enable us to classify snakes into four very useful groups as we shall see in the next chapter.

CHAPTER IV.

THE FOUR GROUPS OF SNAKES.

Group I.—Snakes with no ventrals.

The snakes in this group may have shielded heads or scaly heads but their bellies like their backs are clothed with scales.

The snakes in this group are all harmless.

Group II.—Snakes with narrow ventrals.

These again may have shielded or scaly heads but the belly is covered with transverse plates which do not extend completely across; so that when the specimen lies on its back the last row, and generally several rows, of scales are seen on each side of the ventrals (Fig. 8).

The snakes in this group are all harmless.

Group III.—Snakes with broad ventrals and normally shielded heads.

In these the belly is covered with transverse shields stretching right across the body so that only part of the last row of scales can be seen on either side when the creature lies on its back (Figs. 4 and 5) and the head has normal shields as described in Chapter III.

This group contains both harmless and poisonous snakes, so that we may divide the group into two sub-groups, *viz*:—

Sub-Group A.—Harmless.

Sub-Group B.—Poisonous.

The majority of snakes fall into this group.

Group IV.—Snakes with broad ventrals and scaly heads.

The ventrals of snakes in this group are identical with those in the last but the crown of the head is covered with scales instead of the normal shields (Fig. 9). These scales are similar to those on the back of the snake.

The snakes in this group are all poisonous.

CHAPTER V.

Full description of the common snakes.

In this chapter every common snake is fully described. The snakes are arranged in the four groups.

The details in this chapter need not be studied very carefully. The chapter is meant chiefly for reference when identifying a particular specimen.

GROUP I.— Snakes with no ventrals.

The blind snakes.

There are two families, two or three genera and many species of blind snakes, but there is little interest in exactly identifying them.

Therefore a general description of a *blind snake* is given :—

Length—Small ; from 4 inches or 5 inches to 18 inches.

Shape—Head : very similar to tail from which it is difficult to distinguish it. The mouth is inferior with no mental groove.

Body : worm-like and slender, cylindrical and thicker behind.

Tail : very short and often ends in a minute spine.

Eye : rudimentary and often invisible, being under the shields.

Head shields—The head is irregularly and imperfectly shielded. Rostral prolonged backwards ; and on either side of it are four labials and four largish shields with several small ones behind.

The details are very difficult to make out in the small blind snakes.

Scales—About 22 ; they are cycloid and cover the whole body and are all the same size.

Ventrals—None. The belly is covered with scales.

Colouring—Dark. As a rule, olive-green, brown or black. Belly perhaps a little paler.

Habitat—Found in various parts of India, but not often seen, as they are burrowing snakes, rarely appearing above ground.

GROUP II.—Snakes with narrow ventrals.

THE INDIAN PYTHON (*Python molurus*).

Length—A large, stout snake. Grows upwards of 10 feet. Its size, however, is apt to be exaggerated : probably 20 feet is the maximum.

Shape—Head : distinct from neck with a long snout.

Body : rounded and stout. Rudimentary hind limbs exist as small spurs, one each side of the vent, and are generally visible.

Tail : about one-eighth of the whole length.

Eye : moderate with erect pupil.

Head shields—The head is shielded but not quite normally. The parietal shields are rudimentary and between the frontal and the præ-frontal there are some intercalated shields. The rostral and first two supra-labials are pitted.* There are about 12 supra-labials.

Scales—About 65.

Ventrals—Very narrow, 242 to 262, anal entire, subcaudals 60—72 divided.

Colouring—Three rows of quadrangular brown spots (one median) separated by narrow buff lines.

A brown spot formed by a buff or yellow mark occupies the head.

Habitat—India and Burma.

(The Malayan Python is also found in Burma.)

RUSSELL'S EARTH SNAKE (*Eryx conicus*). †

Length—Grows to 3 feet, but is generally less.

Shape—Head : scarcely distinct from body. Broad snout. The chin has no mental groove.

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* In the Malayan Python (*P. reticulatus*) the first four upper labials are pitted.

† The Red Sand Snake—*Gongylophis conicus* (Nicholson).

Body : a thick rounded body. Rudimentary hind limbs may sometimes be made out in the male.

Tail : very short and tapering, often less than $1\frac{1}{2}$ inch long in large specimens.

Eye : small, pupil vertical, iris partly yellow, partly black.

Head shields—Practically absent. The head is scaled except for a rostral, one or two pairs of small præ-frontals and numerous supra- and infra-labials.

Scales—41—53 : small. keeled.

Ventrals—Narrow, 168 to 186, anal is trifid, *i.e.*, it is divided into a large median and two small external portions ; sub-caudals 17—23 ; single.

Colour—Grey, with an irregular vertebral chain formed by dorsal coalescing rows of reddish brown blotches. Or, dark chocolate brown dorsally sometimes with irregular grey transverse stripes. Laterally grey with various sized reddish brown blotches and spots. Belly white or yellowish or with reddish tinge, often with numerous small dark spots.

Habitat—Common in Central and South India.

JOHN'S EARTH SNAKE (*Eryx Johnii*).*

Length—Grows to 4 feet ; tail only about one-twelfth of length.

Shape—Similar to *Russell's earth snake*, but the chin has a mental groove.

Head shields—Similar to *Russell's earth snake.*

Scales—50—65, much less keeled than those of *Russell's earth snake.*

* The Black Sand Snake (Nicholson).

Ventrals—Narrow, 189 to 209, anal is trifid, *i.e.*, it is divided into a larger median and two small external portions. Sub-caudals 19—36, single.

Colour—Dark olive brown. Generally numerous, ill-defined and indistinct black blotches or unsymmetrical cross-bars and sometimes light reddish pots laterally.

Habitat—Same as *Russell's earth snake,* but it is less common.

THE IRIDESCENT EARTH SNAKE (*Xenopeltis unicolor*).

Length—Upwards of 3 feet, tail one-twelfth of length.

Shape— Head : not distinct, rounded.
Body : cylindrical and stout.
Tail : short and tapering.
Eye : small.
Teeth : small but very numerous.

Head shields—Simulating scales ; a large præ-ocular, no loreal ; behind the triangular frontal are other similarly shaped large scales

Scales—15, large and polished. The outer row enlarged to nearly half the size of the ventrals.

Ventrals—Narrow, 166 to 193, anal bifid. Sub-caudals 20—23 bifid.

Colouring—Black or brown above with remarkable iridescent effects ; scales with lighter edges ; below white or yellowish.

Habitat—Common in Burma.

THE SHORT-TAILED EARTH SNAKE OF BURMA
(*Cylindrophis Rufus*).

Length—About 30 inches.

Shape—Head: small, rounded; not distinct from neck.
Body: cylindrical. Rudiments of hind limbs are usually just distinguishable as a claw-like spur each side of the vent.

Tail: extremely short, blunt with a smooth end.
Eye: very small; pupil round or vertical.

Head shields—Large, symmetrical shields present. No internasals. Nasal single. It forms a suture with its fellow behind the rostral. No loreal or præ-ocular. Upper labials 6 (3, 4).

Scales—19 or 21, smooth.

Ventrals—184 to 245, anal bifid. Sub-caudals 5—10. The ventrals are very narrow, not quite twice as large as the contiguous scales.

Colour—Brown or black above; with or without alternating light cross-bands. Belly white with transverse black bands or spots; or black with transverse white bands.

Lower surface of tail bright vermillion during life.

Habitat—Burma, where it is not uncommon.

THE ROUGH-TAILED EARTH SNAKE (*Silybura ocellata*).

Length—6 to 20 inches.

Shape—Head: small, narrow, conical, with pointed snout. Not distinct from neck.
Body: cylindrical, rigid.
Tail: very distinctive. It is very short and truncated obliquely; slightly flattened, with strongly keeled scales on the upper surface. The terminal scale or shield ends in two small points.
Eye: very small, with round pupil.
Teeth: few and small. No palatine teeth.

Head shields—The nasals are contiguous, there being no internasals. The supra- and post-oculars are confluent. No temporals. Upper labials four.

Scales—17, round and polished.

Ventrals—193 to 234. Very narrow. Sub-caudals 6—11.

Colour—Yellowish ; or brown above usually with numerous transverse series of small, yellow black-edged ocelli. Belly brown with large yellow spots or cross-bands ; or yellow mottled or blotched.

Habitat—These small burrowing snakes are fairly common in the hills of Southern India at a height from 2,000 to 4,500 feet.

RUSSELL'S WATER SNAKE (*Cerberus rhynchops*).

This snake is about the commonest and most typical of the river snakes.

The river snakes live in rivers and estuaries and rarely come to land.

Length—Grows to 3 feet or more. Tail one-fifth of length.

Shape—Head : small, not very distinct from neck. Cleft of mouth turned up behind the eye.

Body : cylindrical.

Tail : moderate, slightly compressed.

Eye : small, pupil vertically elliptic.

Nostrils small, placed on the top of the head and valvular. This feature is characteristic of the river snakes.

Head shields—The head is shielded but irregularly (as in all the river snakes).

The frontal may be broken up into small shields.

The parietals are always more or less broken up into scales.

The nasals are large and in contact behind the rostral. They are semi-divided, the cleft extending from the nostril to the 1st or 2nd upper labial.

Small internasals are present, also a loreal.

One, two or three sub-oculars.

Nine or ten upper labials, the posterior divided transversely.

Scales—23 or 25, very strongly keeled.

Ventrals—Narrow, and rounded, 132 to 160; anal divided. Sub-caudals 49—72.

Colour—Grey, brown, olive, dark ash or blackish above. More or less distinct darker spots or cross-bars, especially posteriorly. A black streak on each side of the head, passing through the eye. A more or less distinct white or yellowish lateral band.

Beneath whitish or yellowish, spotted or barred or marbled with dark ash or black, or almost entirely black.

Habitat—Common in East Indian estuaries.

GROUP III.—Snakes with broad ventrals and shielded heads.

Sub-Group A.—Harmless.

THE BLUNT-HEADED SNAKE (*Amblycephalus monticola*).

Note.—The whole family of snakes, to which this one belongs, is characterised by the absence of a "mental groove." The mental groove, which exists in nearly all other snakes, is a groove running longitudinally along the chin between the sub-linguals or chin shields—(*vide* Fig. 3, *a* to *b*.)

Length—About two feet. Tail five inches.

Shape—Head : thick, large, very distinct from neck. The mouth can be but slightly expanded. There is no mental groove.

Body : compressed and slender.

Tail : slender ; moderate or short.

Eye : moderate with vertical pupil.

Head shields—Regular.

A single nasal.

No loreal but a large præ-ocular.

The sublinguals or chin shields are unsymmetrical. There are three pairs rather large. Note absence of mental groove.

Scales—15, smooth. The vertebral row of scales is enlarged and hexagonal like the krait (Fig. 7).

Ventrals—188 to 194 ; anal entire. Sub-caudals 70—87 ; double.

Colour—Brown above with vertical blackish bars on the sides.

A black line from above the eye to the nape, and another from behind the eye to the angle of the mouth.

Yellowish below, dotted with brown.

Habitat—Eastern Himalayas, Assam, Khasi and Naga Hills. It is not uncommon in these localities and care must be taken not to mistake it for a krait.

ABLABES CALAMARIA (*No English name*).*

Length—A small snake. Grows to about 12 inches, tail one-fourth of the whole length.

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* *Cyclophis Calamaria* (Nicholson),

Shape—Head : scarcely distinct, with obtuse snout.
Body : slender.
Tail : moderate.
Eye : moderate in size.

Head shields—Normal. A single long nasal, pierced by the nostril. The loreal is fused with the nasal. A single præ-ocular. Internasals and præ-frontals, broad and short. Upper labials 7 (3 and 4).

Scales—15, smooth.

Ventrals—129 to 138 ; anal bifid. Sub-caudals 50—83, divided.

Colouring—Light olive, with a reticulated pattern formed by a black edge to each scale. This reticulation forms four thick lines along the back, two on each side of the middle line ; also two thin lines on each side, *i.e.*, two lateral lines. Alternate with these are five white lines (on each side). Belly white.

Habitat—Ceylon and South of India.

THE VARIEGATED KUKRI SNAKE (*Oligodon subgriseus*).

Length—10 to 18 inches.

Shape—Head : short, not distinct from neck.
Body : sub-cylindrical. A small snake.
Tail : one-seventh of body.
Eye : small ; pupil round, iris golden.
Teeth : no palatine teeth.*

Head shields—Nostril between two partly confluent nasals. One præ-ocular ; one or two post-ocular. Rostral produced backwards. Supra-labials 7 (3 and 4).

* A very exceptional characteristic.

Scales—15, smooth, rounded.

Ventrals—180 to 202; anal bifid. Sub-caudals 48—54 bifid.

Colouring—Brown with numerous narrow dark fasciolated cross lines, crossed by three longitudinal whitish stripes; belly white. Head with symmetrical > markings which are characteristic of the whole genus.

Habitat—Said to be common in the South of India.

NOTE.—Other species are very similar but generally with fewer ventrals.

SIMOTES ARNENSIS (*No English name*). *

Length—Grows to 2 feet. Tail one-seventh.

Shape—Similar to *Oligodon subgriseus*, but, like nearly all other snakes, it has palatine teeth.

Head shields—The internasals are short and transverse and the rostral is produced backwards between them. Nostril lies between two nasals.

Scales—17, smooth.

Ventrals—160 to 200; anal bifid. Sub-caudals 47—56, divided.

Colouring—Brown with 20 to 30 or more broad black, very slightly white-edged cross-bands. Belly white.

Head markings very distinct; a black fillet through the eyes; a > rising from the throat, the point on the frontal shield, the first cross-band forming another > behind it.

Habitat—Common in India and Ceylon.

* *Simotes Russellii* (Nicholson).

THE CORAL-TAIL SNAKE (*Simotes cruentatus*).

Very similar to *Simotes arnensis*. But the anal is sometimes entire. The chief difference is only in the *colouring*. Olive brown; a dark vertebral stripe, sometimes enclosing a lighter stripe; a thin lateral stripe. Belly greenish yellow with square blue-black spots; sub-caudals coral-red with black spot at the root and near the tip of the tail. Punctulated head markings often not unlike a mask.

The coral-red of the tail, however, changes to yellow after death.

Habitat—Common in Burma.

SIMOTES CYCLURUS (*No English name*).*

Length—Similar to the two preceding snakes, but larger. It grows to $2\frac{1}{2}$ feet and has a stout body.

Scales—19 or 21.

Ventrals—160 to 210; anal entire. Slight ventral keel. Sub-caudals 36–58, divided.

Colouring—Light reddish brown, with three darker stripes; the vertebral stripe encloses a light median line and extends on to the frontal head shields separating two oblique head markings that converge from the dorsal stripes. Fillet across the eyes. Belly white or fawn with alternate square spots.

Habitat—Common in Burma.

THE COMMON WOLF SNAKE (*Lycodon aulicus or striatus.*)

Length—One to two feet.

Shape—Head distinct, with flat, long snout.

Simotes bicatenatus (Nicholson).

Body : slender, rather flattened.

Tail : tapering.

Eye : small, black, beady. The vertical pupil is hard to distinguish on account of the black iris.

Teeth—The anterior teeth both in the upper and lower jaw are long. This characteristic, though not always very conspicuous, can generally be made out.

Head shields—Regular. (In *aulicus* the præ-ocular reaches the frontal ; in *striatus* it does not.)

Scales—17, smooth.

Ventrals—178 to 224 ; anal divided. Sub-caudals 57--77; double.

Colouring—Chocolate brown with numerous white or yellowish cross-bands decussating laterally and most evident in the anterior part of the body. In old specimens the cross-bars are less distinct.

Habitat—A very common snake both in India and Burma. On account of its colour, I suppose, it is frequently mistaken for a krait. It is small, lively and bites readily, hence kraits have got the reputation for these characteristics.

THE LITTLE TRINKET SNAKE (*Coluber Helena*).*

Length—Grows to upwards of 3 feet, tail one-fifth.

Shape—Head : narrow with elongated snout. Distinct.

Body : slender and compressed.

Tail : moderate or tapering and thin.

Eye : moderate, pupil round with greenish iris.

Head shields—Regular.

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* *Cynophis Helena* (Nicholson).

Scales—27, slightly keeled.

Ventrals—About 220 to 250 ; anal entire. Sub-caudals about 70—100 ; double.

Colouring—Reddish olive, with about 30 anterior reticulated black cross-bands, each enclosing 3 white ocelli on either side ; between the cross-bars is a reticulated lavender pattern ; the whole principally interstitial, fading posteriorly into a broad lateral brown stripe ; neck with two black throat stripes ; black postocular streak. A beautiful snake.

Habitat—Ceylon and South India. I found it in Mhow.

THE RED DHAMAN (*Coluber radiatus*).*

Length—Grows to six feet, tail one-fifth.

Shape—Head : narrow with long snout.
Body : elongate and compressed.
Tail : moderate.
Eye : moderate with golden iris.

Head shields—Normal ; one præ ocular and two nasals. The præ-ocular and loreal have a rough porous appearance. Labials, 9 (4, 5 and 6).

Scales—19 : keeled, especially the middle rows.

Ventrals—222 to 248 ; anal single. Sub-caudals, 67—95.

Colouring—Bright chestnut darkening posteriorly. Three anterior black dorsal stripes, the upper broad, the middle interrupted, the outer interstitial. From the eye radiate three black streaks : one down, one downwards and backwards, one horizontally along the parietals joining a broad, black nuchal band.

Habitat—Common in Burma.

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* *Compsosoma Radiatum* (Nicholson).

THE DHAMAN OR RAT SNAKE (*Zamenis mucosus*).*

Length—A large snake, six, seven or eight feet long, and 3, 4 or 5 inches in girth. Tail, one-fifth to one-third of length.

Shape—Head : distinct, rather short and broad.

Body : elongate and somewhat compressed but stout.

Tail : tapering.

Eye : large, pupil round, iris golden.

Head shields—Normal. The supra-oculars overhang and shelter the eye. Two præ-oculars, the upper reaching right into the crown of the head. Generally 3 loreals. Two nasals. The head shields, especially the 8 supra-labials, have black margins.

Scales—17, not markedly keeled, except perhaps the middle rows towards the tail.

Ventrals—196 to 208 ; anal bifid. Sub-caudals, 108—134, double.

Colouring—Brownish, yellowish olive or very dark olive green ; with interstitial skin-colouring of yellow and black. Scales with black tips. Ventrals have thin posterior black edges, with a row of black dots on each side of them. This on the double sub-caudals makes a reticuled pattern on the tail. Belly greenish or yellowish white.

When young is often a delicate green colour, unlike the adult.

Habitat—Very common in India.

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* *Ptyas mucosus* (Nicholson).

THE SLENDER DHAMAN (*Zamenis korros*).*

Length—Six to seven feet.

Shape—Head : narrow with slender neck.
Body, etc. : generally like the Dhaman.

Head shields—Normal, generally only two loreals and the shields have no black margins, otherwise like the Dhaman.

Scales—15, smooth, with apical grooves.

Ventrals—176 to 184; anal bifid. Sub-caudals 138—147, but may be less (57 in one specimen).

Colouring—Uniform brown olive. In the young there is a transverse series of roundish pearl-coloured spots, forming cross-bands. The sub-caudals have black margins, but not so marked as in the Dhaman.

Habitat—Common in Burma, rare in India.

Several other of these "Dhamans" are common, but they have no special English names, so we must fall back on their scientific names to distinguish them.

ZAMENIS VENTRIMACULATUS (*No English name*).

Length—About 3 feet; tail, 9½ inches.

Shape—Head : elongate, distinct; with snout, obtuse and feebly projecting.
Body : elongate and cylindrical.
Tail : long.
Eye : moderate with round pupil.

Head shields—Regular. A small sub-ocular is present below the præ-ocular. Upper labials 9 (5, 6). The posterior sublingualsare separated by two series of scales.

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* *Ptyas korros* (Nicholson).

Scales—19, smooth.

Ventrals—194 to 220; anal bifid. Sub-caudals 82—119.

Colour—Greyish, olive or yellowish olive above, usually with more or less marked dark or black cross-bars. Yellowish below with a series of black spots on each side of the belly. A black oblique streak below the eye and another on the temple.

Habitat—Commonest in Northern India, Punjab, Kashmir, Baluchistan; also Sind, Cutch and Bombay.

ZAMENIS FACIOLATUS (*No English name*).

Length—Grows to $3\frac{1}{2}$ feet in length, ; tail one-fifth.

Shape—Head : small, flat; not very distinct from neck. Snout obtuse, curved and projecting.

Body : elongated, slender, tapering.

Tail : very slender.

Eye : rather large, pupil round, iris faintly edged with yellow.

Head shields—Regular, but the temporals are small and scale-like. Posterior sublinguals are separated by two or three series of scales. Usually a small sub-ocular. Labials 8 (4 and 5).

Scales—21 or 23, smooth.

Ventrals—200 to 230; anal bifid. Sub-caudals 73—95, double.

Colouring—Yellowish, reddish or olive brown. In the anterior part very distinct narrow, white and dark variegated cross-bars about one-quarter inch apart. In the young these bars consist of about ten white dots, each surrounded by a black margin, the black margins being con-

tiguous. In the posterior part of the snake the bars gradually become less and less distinct, the black part becoming brown and the bars running into one another. On the tail the bars are not distinct at all.

The cross-bands may entirely disappear in the adult. The crown of the head has some white spots or blotches on it. The belly is uniform yellowish.

Habitat—Fairly common, especially in the South of India.

ZAMENIS DIADEMA (*No English name*).

Length—May grow to 6 feet, tail one-fifth.

Shape—Similar to *Zamenis ventrimaculatus*.

Head shields—The præ-frontals are usually broken up into several shields; often three series of shields between the rostral and the frontal.

Sub-oculars are present, usually a series of four or five.

The temporals are small and scale-like. Loreals three or four. Upper labials, 14.

Scales—May be 25 to 33. 29 is the most usual number. Slightly keeled.

Ventrals—210 to 278; anal entire. Sub-caudals 65—110, divided.

Colouring—Yellowish olive, pale buff or sandy grey above with a vertebral line of more or less marked round dark brown spots, usually forming a series of rhombs. A lateral brown stripe or series of dots.

Lower parts white, usually with small blackish spots.

Head may be spotted or entirely, or partially black above.

Habitat—Sind, N.-W. India, Kashmir.

THE CHECKERED KEELBACK (*Tropidonotus piscator*).*

Length—Grows to four feet.

Shape—Head : distinct with narrow crown.
Body : rather stout.
Tail : often short in females.
Eye : moderate, pupil round, iris edged with gold.
Nostrils : rather superior.

Head shields—Normal. Loreal rhombic. Internasals form a triangle ; one præ-ocular ; three post-oculars. Labials, 9 (4, 5).

Scales—19, keeled.

Ventrals—129 to 149 ; anal bifid. Sub-caudals 50--90, double.

Colouring—Varies from yellow to very dark olive brown. May be six alternating rows of square black dots, forming black checkers, but sometimes only the outer row is distinct. There may be red colouration between the outer dots. Two black streaks go backward from the orbit Belly cream-coloured with lateral black ventral margins.

Habitat– Common in India and Burma.

THE BUFF-STRIPED KEELBACK (*Tropidonotus stolatus*).†

Length—A rather small snake. May grow to $2\frac{1}{2}$ feet. Most specimens under 2 feet.

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* *Tropidonotus quincunciatus.* (Nicholson).

† The Chameleon Snake (Nicholson).

Shape—Head : small, not very distinct from neck.
Body : elongate, slender.
Tail : fine and tapering.
Eye : moderate in size ; pupil round, iris golden.
Teeth : small, usual type.

Head shields—Normal. Nasal double, one loreal, one præ-ocular, three post-ocular, one temporal.
Labials 7 or 8 (3, 4, sometimes 5). The sixth labial is large and invades the temporal region.
Sublinguals : two pairs as usual, but the posterior pair is separated by two small scales anteriorly and a large pair posteriorly.

Scales—19, strongly keeled.

Ventrals—121 to 161 ; anal bifid. Sub-caudals 50—79, double.

Colouring—Greenish brown, with two conspicuous yellow parallel stripes along the back. Numerous black cross-bands, interrupted by these yellow lines. The colour gets so dark posteriorly, that the black cross-bands can hardly be distinguished. The yellow stripes are lighter where they cross the black cross-bands.
Between the cross-bands anteriorly is a rather inconspicuous pale blue colouring, much more apparent when the snake is alive and excited, at which time these parts are often red.
The throat, supra-labials and præ- and post-ocular shields are yellow.
Belly white with a series of lateral black dots on most of the ventrals, more apparent anteriorly.

Habitat—Common in India and Burma.

THE HIMALAYAN KEELBACK (*Tropidonotus platyceps*).

Length—About three feet; tail 9½ inches.

Shape—Head: distinct from neck.
Body: elongate, cylindrical.
Tail: moderate in length.
Eye: moderate with round pupil.

Head shields—Normal; upper labials 8 (3, 4, 5).

Scales—19, feebly keeled.

Ventrals—177 to 235 with rounded ends. Anal divided. Sub-caudals 75—107.

Colour—Variable. Olive brown above with small black spots; frequently two black parallel lines, or an elliptical marking on the nape.
A light black-edged streak on each side of the head; or, a black line from eye to nape.
Belly yellowish, with or without blackish dots; frequently a black line or a series of elongate blackish spots along each side of the belly; lower surface of tail frequently mottled blackish.
Throat sometimes black.

Habitat—Himalayas and Khasi Hills. It is common in some parts, *e.g.*, Kasauli.

THE OLIVACEOUS KEELBACK (*Helicops schistosus*).*

Length—About two feet; tail a quarter of length.

Shape—Head: a short, rather pointed muzzle.
Body: rather stout.
Tail: rather long.
Eye: small, pupil round, iris speckled with gold.
Nostrils: placed rather high.

* *Atretium schistosum* (Nicholson).

Head shields—Normal. The internasals are united into one broad triangular shield in contact with the rostral.

Scales—19, keeled.

Ventrals—129 to 150; anal bifid. Sub-caudals 55—85.

Colouring—Olive green or brown above; sometimes with two series of small black dots along the back. Uniform yellow below. Upper lips also yellow.

A thin long black post-orbital stripe is sometimes present.

Habitat—South of India and Ceylon.

THE GREEN KEELBACK (*Macropisthodon plumbicolor*).*

Length—Between two and three feet in length.

Shape—Head: not markedly distinct.

Body: stout and somewhat heavy.

Tail: somewhat short and tapering, in many specimens, markedly and abruptly smaller than the body.

Eye: fairly large, pupil round; iris golden.

Head shields—Normal. Supra-oculars are prominent.

The loreal sometimes wedges itself between the præ-oculars, entering the orbit; and conversely the lower præ-ocular sometimes pushes in between the loreal and the supra-labials. But in many specimens neither of these peculiarities occurs. Post-oculars generally three. Supra-labials 7 (3 and 4).

Scales—23, 25 or 27, strongly keeled.

Ventrals—140 to 162; anal bifid. Sub-caudals 35—47, double.

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* *Tropidonotus plumbicolor*—The Green Ground Snake (Nicholson).

Colouring—Bright, uniform green throughout. In young specimens there is a broad, yellow, black-margined > collar ; narrow black cross-bars with alternate black spots and alternate white interstitial cross-lines.

These colours are not, in my experience, present in the adult, though traces of them can be made out in many specimens.

Habitat—Very common in Central and South India.

THE WHIP SNAKE (*Dryophis mycterizans or perroteti*).*

Length—Grows to six feet. The tail is often nearly as long as the body.

Shape—Head : elongate, distinct. The snout is very long and ends in a flexible appendage.

Body and tail are elongate, compressed and excessively slender and long.

Eye : large ; pupil, horizontal.

Head shields—The nostril is in a single nasal. The præ-ocular region is concave. There is no loreal.

Scales—15, smooth, narrow and much imbricate. The vertebral series are slightly larger than the others and fanshaped.

Ventrals—172 to 188 ; anal entire. Sub-caudals 140—166, slightly keeled.

Colouring—Grassgreen, with yellow lateral stripe; paler below. Black and white cross-bands on the interstitial skin.

Habitat—Common in most parts of India.

NOTE.—In the Nilgiri Hills *the Whip Snake* is slightly different. The tapering snout has no flexible appendage.

* *Passerita Mycterizans*—the Common Green Tree Snake (Nicholson).

The number of ventrals is less, *viz.*, 135 to 147 ; anal divided. Sub-caudals 66—82. Hence it is considered a different species (*Dryophis perroteti*).*

In Burma and Bengal the common Whip Snake is replaced by the

BUFF WHIP SNAKE (*Dryophis prasinus*).†

It is very similar to the common Whip Snake, but differs as follows :—

The *snout*, though very long, has no flexible appendage.

There are one or more *loreal shields* present. The *ventrals* are more numerous, *viz.*, 203 to 234 ; anal divided (very rarely it is entire). Sub-caudals 155—207.

The *colour* varies. Sometimes green with a white lateral stripe. But it may be light ochre with white belly and a lateral ochre stripe. Or, it may be pale olive or grey-brown with a yellow stripe along each side of the lower parts.

It has been known of a pure white.

The interstitial skin of the neck is black and white.

THE BRONZE-BACK TREE SNAKE (*Dendrophis pictus*).‡

Length—Grows to four feet, tail one-third of its length.

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* Nicholson: *Tropidococcyx perroteti.*

† Nicholson: The Buff Tree Snake—*Tragops prasinus.*

‡ Blue Tree Snake (Nicholson). *Dendrelaphis tristis* is so similar that a separate mention is not required in this book.

Shape—Head: a moderately long, rounded snout. A rather long, flat head, distinct from the slender neck.

Body and tail very elongate, slender and compressed.

Eye: large with round pupil; iris yellowish.

Head shields—Normal.

Scales—15, smooth and imbricate. The vertebral series are larger than the rest and polygonal in shape.

Ventrals—160 to 200; anal bifid. Sub-caudals 87—156, double.

The ventrals have two keels at their ends and are nearly square at these keels, *i.e.*, the ends of the ventrals make two straight lines, one on each side of the belly.

Colouring—Rather variable. Either deep blue with a bright yellow lateral stripe; ventrals yellowish, with a lateral spot at regular intervals. Or, bronze with blue margins to the scales under the imbrication, belly yellow and dark lateral stripe from eye to vent.

Habitat—India and Burma.

THE GOLDEN TREE SNAKE (*Chrysopelea ornata*).

Length—Grows to four feet, tail one-quarter.

Shape—Similar to the Bronze-back Tree Snake. It is slender and elongate, but less so than some other tree snakes.

Head shields—Normal.

Scales—17, smooth, rhombic in shape, imbricate. Vertebral row *not* enlarged.

Ventrals—180 to 236; anal bifid. Sub-caudals 96—147.

Ventrals have two sharp keels with a notch at

the hind margin. The last ventral is divided like the anal.

Colouring.—Head: black with yellow punctulated cross-bands.

Body: black, with a flowered pattern formed by bright yellow dots on each scale, or with yellow punctulated cross-bars.

Habitat.—India and Burma.

THE COMMON BROWN TREE SNAKE (*Dipsadomorphus gokool or trigonatus*).*

Length—Grows to three or even four feet; tail one-sixth.

Shape—Head: broad, short and very distinct.

Body: compressed, elongate and slender, thickest in the middle.

Tail: very tapering, coming to a fine point.

Eye: moderate, pupil vertical, iris golden.

Head shields—Regular.

Scales—21, smooth, imbricate. The vertebral series are slightly enlarged.

Ventrals—211 to 269; anal entire. Sub-caudals 78—102, double.

Colouring—Yellowish or greyish brown or greyish olive. It has dark cross-bars. Or, a series of irregular buff, black-edged vertebral spots, from the sides of each of which drops a black fasciolated Y mark.

Belly: white or yellowish with lateral brown or black dots.

The head has more or less distinct brown or yellow markings.

Habitat.—Common in India.

* *Dipsas* (Nicholson).

THE BURMESE BROWN TREE SNAKE (*Dipsadomorphus multimaculatus*).*

Very similar to the *common brown tree snake.* But

Scales—19, or sometimes only 17. Vertebral series slightly enlarged.

Ventrals to 202—245. Sub-caudals 80—106.

Colouring—Dark fawn, with a numerous dorsal series of round, dark spots with black and white margin; the spots often have black pendants and alternating white dots. Head has a black > and post-ocular streak; or a broad arrow enclosing a large round spot. Belly white, mottled with fawn.

Habitat.—Burma.

THE SIND SAND SNAKE (*Psammophis schokari*).

Length—About four feet; tail 17 inches.

Shape—Head: distinct from neck. Long pointed snout, loreal region very concave.

Body: cylindrical, elongate.

Tail: elongated.

Eye: moderate, with round pupil.

Head shields—Normal. The frontal is long and narrow, the supra-oculars rather prominent. Upper labials 9 (5, 6).

Scales—17, smooth (rarely 19).

Ventrals—162 to 195; anal divided. Sub-caudals 93—149.

Colouring—Yellowish, greyish, pale olive or reddish above. It may be uniform, or spotted or striped with darker colour.

* *Dipsas* (Nicholson).

A dark streak on each side of the head, passing through the eye. Or, two yellow streaks from nose to neck, passing one above and one below the eye.

Lips : usually with dark dots or spots.

Belly : yellowish, usually with dark dots and one or two interrupted dark lines on each side ; or very thin lateral black stripes.

Habitat—Baluchistan, Sind, Punjab.

THE COMMON DESERT SNAKE (*Psammodynastes pulverulentus*).

Length—Adult length about a foot ; tail one-fifth.

Shape—General appearance and colour not unlike a short, narrow-headed *common brown tree snake.*

Head : long and very distinct from neck. Snout short and obtuse, crown flat, loreal region very concave.

Body and tail rather stout.

Eye : moderate, pupil vertical.

Teeth : the second or third tooth long and enveloped in a large mucous envelope so as to simulate a poison-fang.

Head shields—Normal.

Internasals very small ; præ-frontals rounded or angulated behind ; frontal long ; supra-oculars prominent ; nasal single, pierced by nostril. Labials 8 (3, 4, 5) ; the first three high.

Scales—17 (rarely 19), short, rhombic, smooth.

Ventrals—146 to 167 ; anal entire. Sub-caudals 50—59, divided.

Colouring—Light brown, mottled. When young a black vertebral stripe, with an edging of

black and white spots; this disappears with age.

Throat: white, mottled; < mark on head.

Belly and sides yellow with a median and two lateral rows of brown mottling or lines.

Habitat—Assam, Burma.

SUB-GROUP B.—Poisonous.

THE COMMON INDIAN KRAIT (*Bungarus caeruleus, B. arcuatus*).

Length—May grow to four feet. Usually between two and three feet, tail one-eighth.

Shape—Head: small; not very distinct.

Body: moderately stout.

Tail: short, rather tapering.

Eye: small with black iris, so that the round pupil cannot be seen.

Teeth: a short poison-fang.

Head shields.—The nasal touches the first and second supra-labials, but never the third.

Loreal absent.

Temporal, a single shield touching fifth and sixth supra-labials. Supra-labials 7 (3 and 4).

Posterior sublinguals touch fourth infra-labial.

Infra-labials 4, the fourth the largest * and touches only 2 scales behind. (Fig. 10.)

Scales—15, smooth. *Vertebral row distinctly enlarged* * and hexagonal. (Fig 7.)

Ventrals—201 to 221; anal entire. Sub-caudals 38—56, *entire.*

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* These two characteristics distinguish kraits from all other snakes.

Colouring—Glistening black with linear narrow or broad white cross-bars, usually most apparent in the posterior part of the body.

Habitat—India. Said to be common nearly everywhere. In my experience it is not so very frequently met with, though harmless snakes are constantly being mistaken for kraits.

THE BRANDED KRAIT (*Bungarus fasciatus*).

Length—May grow to six feet, but not often found as long as this.

Shape—Head : small ; not very distinct.
Body : the back is ridged along the spine.
Tail : very short, blunt and stumpy.
Eye : small ; the edge of the iris is golden ; pupil round.
Teeth : a short poison-fang.

Head shields—Same as *the common Indian krait.*

Scales—15, smooth. The vertebral row is markedly enlarged, the scales being broader than they are long.

Ventrals—200 to 233 ; anal entire. Sub-caudals 23—37, entire.

Colouring—Alternately and completely banded black and yellow.

Habitat—Burma and Assam, where it is said to be common ; also found in Eastern Bengal and other parts of India, but is rare in India.

THE COBRA (*Naia tripudians*).

Length—From 4 to 6 feet. It is rare to find one measuring more than $5\frac{1}{2}$ feet.

Shape—Head : short and rounded.

Body : anterior ribs elongated and capable of being erected so as to dilate the skin of the neck into the well-known hood.

Tail : rather short.

Eye : moderate with round pupil. An erect short poison-fang.

Head shields—Supra-labials 7.

The 3rd supra-labial touches both the nasal shield and the eye. (Fig. 11.)

The præ-ocular shield touches the internasal. Between the fourth and fifth infra-labial shields a small wedge-shaped scale occurs called the "cuneate." (Fig. 11 *c*). The cuneate occurs in no other land snake.

The fourth and fifth infra-labials are the largest of the series and about subequal. No loreal.

Scales—The number varies. At the neck 31—33, middle of body 19—27.

Ventrals—184 to 197 ; anal entire. Sub-caudals 53—69, divided.

Colouring—Very variable. May be any shade from buff or wheat-colour to olive, brown, black or even green. The hood may be without marks or may have the spectacle-like device or an oval spot surrounded by an ellipse or various modifications of these. The ellipse is generally seen in the Burman variety. The mark is on the skin, not on the scales.

Habitat—India and Burma. A very common snake.

THE HAMADRAYAD OR KING COBRA (*Naia Bungarus*).

Length—Grows to 12 feet. One is recorded of over 15 feet.

Shape—The neck is dilatable, but to a less extent than in the cobra. Pupil round. An erect, short poison-fang.

Head shields—A pair of large shields are in contact with one another behind the parietals. No other snake has this feature.

Two temporals, the lower touching the fifth, sixth and seventh supra-labials.

Supra-labials 7. The third supra-labial touches the nasal shield and the eye as in the cobra. (Fig. 11.)

Scales—15 (on the hood about 19).

Ventrals—215 to 262 ; anal entire. Sub-caudals 80—100. About the first ten sub-caudals are entire, the remainder are divided. This feature is possessed by no other snake, except some rare varieties of the krait, and the krait would be distinguished at once by its enlarged vertebrals. The king cobra is thus easily identified.

Colouring—The young are jet black with white or yellow cross-bars or chevrons.

Adults vary. They may be yellow, olive-green, olive-brown, blackish-brown or black with more or less distinct yellowish or whitish cross-bars or chevrons. Light specimens are often more or less variegated with black.

Throat light-yellowish, belly may be mottled or barred.

Habitat.—India. Found in jungles or their vicinity.

The Coral Snakes.

Appropriately so called by Wall, since most of them have bellies adorned with a beautiful colouring resembling pink coral.

There are seven different kinds of coral snakes, all rare ; but they are mentioned in order to complete the poisonous snakes.

A general description of a coral snake will suffice.

A Coral Snake.

Length—Generally about 2 feet or under. One is only 13 inches and another grows to 4 or 5 feet.

They are small snakes.

Shape—Head : short ; not distinct from neck.

Body : long and slender.

Tail : short.

Eye : with round pupil.

Teeth : an erect, short poison-fang.

Head shields—The third supra-labial touches the nasal (as a rule) and the eye. (The only other snakes which have this feature are the cobra and king cobra with which the coral snakes are not likely to be confused. Hence a coral snake can be recognised by this feature alone.) (Fig. 11.)

There is no loreal.

Scales—13.

Ventrals—Considerably over 200. The anal generally bifid, but is entire in one or two rare Burmese specimens.

Sub-caudals under 50, double.

Colouring—The various species vary in colour. Some are black with red heads and tails, others reddish brown, yellow or red. Most are marked with transverse or longitudinal bands or lines and in most the belly is red or pink, either uniform or transversely marked.

Two kinds have yellow bellies.

Habitat—May occur in Burma and parts of India, but would seem to be rare in these places.

Nothing is known about the poison of the coral snakes. They are so small and the gape of the mouth is so limited, that it is very doubtful if they would do any harm to a man.

SEA-SNAKES (*Hydrophiinæ*).

A sea-snake can always be recognised by the fact that the tail is compressed, *i.e.*, flattened out to form a vertical fin like that of an eel.

The head is covered with large shields.

Sea-snakes are reputed very deadly and the poison of the commonest is eight times as powerful as that of a cobra.

GROUP IV.—Snakes with broad ventrals and scaly (not shielded) heads.

This group consists of the *vipers* and the vipers only.

There are two kinds of vipers, *viz.*, the pit-vipers and the pitless vipers.

The former have a deep pit between the eye and the nostrils, called the *loreal pit*. No other snakes have this pit, so a pit-viper is easily recognised.

The Pitless Vipers.

THE SAW-SCALED VIPER (*Echis carinata*). *

Length—One to one and a half feet ; tail one-twelfth.

* Also called *Phoorsa*, *Kupper* and other local names.

Shape—Head : broad and thick.
Body : stout.
Tail : short.
Eye : moderate with erect pupil.
Teeth : a very long poison-fang capable of complete depression.
Nostril : small.

Head shields—Except two very small internasals, a small single nasal and a pair of sublinguals, the head is completely scaly. (Fig. 9.)

Scales—25 to 37, strongly keeled and much imbricate.

Ventrals—149 to 154 ; anal entire. Sub-caudals 21—26, *single.*

Colouring—Sandy, grey, light-brown or dark cedar. A more or less distinct pale sinuous line along the flank.
A broad, pale brown > mark on the head. Belly whitish, spotted.

Habitat—India; common in many parts, especially sandy, desert-like places in the plains.

RUSSELL'S VIPER (*Vipera Russelli or Daboia elegans*).*

Length—Grows to five feet ; tail one-sixth.

Shape—Similar to the *saw-scaled viper* but much larger and stouter. The nostril is large.

Head shields—The head is completely scaled except three small shields surrounding the nostril and the sublinguals. (Fig. 9.)

Scales—27—33, strongly keeled and imbricate.

Ventrals—163 to 170 ; anal bifid. Sub-caudals 45—60, *double.*

* Also called the *Chain Viper*, *Daboia*.

Colouring—Buff or light-brown with three longitudinal series of large, dark white edged ring-spots, the median series often confluent. Head has a pink or salmon V with its apex on the snout. Belly : whitish and spotted.

Habitat—India, chiefly the plains. In some parts quite common.

The Pit Vipers.

All the pit-vipers can be readily recognised by the loreal pit, which is a conspicuous opening between the eye and the nostril.

There are about twelve species, but we need not trouble to distinguish between all these. It is sufficient for our purpose to be able to "spot" a pit-viper.

The pit-vipers are found only in hilly regions at heights from 2,000 to 10,000 feet.

I shall give a general description and then specify the two commonest.

The Pit-Viper.

Length—Varies from one to four feet.

Shape—Head : broad, thick, almost sub-triangular and very distinct from neck. It contains the loreal pit.

Body : stout.

Tail : moderate or short.

Eye : moderate with vertical pupil.

Teeth : a long poison-fang.

Head shields—Of the twelve species, nine have scaly heads. Not, however, quite so scaly as the

pitless vipers, as supra-oculars, nasals, labials, etc., can generally be made out.

Unfortunately for the strict definition of our Group IV, three of the species have nearly normally shielded heads like the snakes in Group III. One of these three is the *common Himalayan Viper*. But as these three are vipers and so naturally come into Group IV, and can be readily recognised by the loreal pit, I have not thought it necessary to make another group.

Scales—Generally about 21—25. One species has 29.

Ventrals—Less than 200.

Colouring—Pit-vipers are all green or brown with various black markings.

Habitat—Hilly or mountainous regions. The Himalayas, Ghats, South Indian ranges and Ceylon.

THE COMMON VIPER OR BAMBOO SNAKE
(*Lachesis gramineus*).

Length—Grows to 3 or $3\frac{1}{2}$ feet.

Shape—As above.

Head shields—A scaly head. But there is a single supra-ocular and 9 to 12 labials, also a single nasal.

Scales—21, keeled. Posteriorly only 15.

Colour—Usually vivid foliage-green. More rarely yellowish or brown, sometimes streaked with black. Usually a well defined white or yellow flank line.

Belly: whitish or greenish, uniform or indistinctly mottled.

Habitat—Much the commonest and most widely distributed of the pit-vipers. Found in the Himalayas, E. and W. Ghats, Nilgiris and other hills,

THE COMMON HIMALAYAN VIPER (*Ancistrodon Himalayanus*).

Length—About 2 feet in length.

Shape—As given above. The snout is a little turned up. Pupil vertical with the iris edged with yellow.

Head shields—It has a normally shielded head like the snakes in Group III. The loreal pit will distinguish it.

Scales—21 or 23, keeled.

Ventrals—150 to 160 ; anal entire. Sub-caudals 40—50, divided.

Colouring—Brown of various hues ; sometimes nearly uniform, especially in light specimens, but more often mottled or variegated so as to form bars, or a nondescript carpet-like pattern. Wall thus describes it ; Nicholson says : dark-brown with band-like spots. One I found in the Liddah Valley, Kashmir, had a regular pattern of a double row of large diamond-shaped marks, outlined black, with a plain, steely black belly. The belly may be peppered blackish and red on a whitish ground or black, marbled with yellow.

Habitat.—Only found in the Himalayas, where it is very common in certain localities.

CHAPTER VI.

HOW TO DISTINGUISH POISONOUS FROM NON-POISONOUS SNAKES.

Hardly any one could remember enough about snakes to spot even all the common ones without the book ; but it is

quite easy to remember sufficient to be able to say definitely whether any given snake is poisonous or not.

The first thing to do is to place the unknown snake into one of the four groups mentioned in Chapter V. Look first at the belly. If there are no ventrals, or only narrow ventrals, the snake falls into Groups I or II, respectively, and *all* snakes in these two groups are harmless.

But suppose the specimen has broad ventrals. The next thing to do is to inspect the head. If (with broad ventrals) the head is scaly the snake falls into Group IV and *all* snakes in Group IV are poisonous, for they are all vipers of sorts.

If, so far, we have not placed our snake, it is one with broad ventrals and a shielded head and falls into Group III. It may be either poisonous or non-poisonous.

But in Group III there are only two poisonous snakes which are at all common.

These two are the Cobra and the Krait.

There will not be much difficulty in saying whether the specimen is a cobra. A big snake, four or five feet long, with its characteristically marked hood it is one of the easiest snakes to tell. If in any doubt, examine the scales in the upper lip. *The third supra-labial scale touches the nasal shield and the eye.* (Fig. 11.) No harmless snake has this feature.

If not a cobra, is the specimen a krait? We must be careful in answering this question, as there is a tendency to call all small snakes kraits. But kraits are not very small except when young. The Indian krait is usually about 2 to 3 feet in length, but it may grow to 4 feet or more while the Banded or Burman krait may reach nearly to 6 feet.

To spot a krait the first thing to do (after placing the specimen in Group III) is to look at the vertebral row of scales, *i.e.*, the row along the middle of the back. In the

krait these scales are distinctly enlarged (Fig. 7.) If they are the same size as the other scales the specimen cannot be a krait. Still some other snakes (harmless) have the vertebral scales enlarged, so we cannot rely on this point alone.

But the colour of a krait is very distinctive. It is a glistening black snake with white (or in Burma yellow) cross-bars.

In all kraits, too, except some rare varieties, the sub-caudals are entire. Lastly, to make quite certain, examine the scales on the lower lip. *A krait has only four infra-labial shields and the fourth is the largest.* (Fig. 10.)

If the specimen, already placed in Group III, is neither a cobra nor a krait, it is almost certainly a harmless snake.

So far all that has been said in this chapter can, I think, easily be remembered. It will be necessary to make quite sure that we can spot a krait and then we can with confidence say whether the snake is harmless or poisonous.

To recapitulate: place the snake in one of the four groups. If it falls into Groups I or II it is harmless; if into Group IV it is poisonous; if into Group III it is harmless, unless it is a cobra or a krait.

To be absolutely certain that a given snake is harmless a little more must be remembered. It is possible, of course, that we are dealing not with a krait or cobra and not with a harmless snake but one of the rare poisonous snakes. We have settled that our specimen is not a viper (Group IV) and not a krait or a cobra. If it is not a harmless snake, what could it possibly be? Well, it might be a king cobra or a coral snake, or it might be one of the three pit-vipers which have shielded heads. There are no other poisonous snakes in India or Burma known so if we can manage to remember how to spot these as well as the cobra and krait we can make absolutely certain as to the harmlessness or otherwise of the given specimen. A reference to the description

of these snakes in Chapter VI will show that it is quite easy to remember their characteristics. It is really sufficient to note that the king cobra and the coral snakes resemble the cobra in having the third supra-labial shield touching the nasal shield and the eye (Fig. 11). No other snakes but these, *viz.*, the cobra, king cobra and coral snakes, have this characteristic.

The three pit-vipers, in spite of their shielded heads, would be recognised at once by the loreal pit.

To complete this chapter I may remind the reader that the sea-snakes are all poisonous. They present no difficulty, however, as they would be recognised at once by the eel-like tail, flattened out vertically to form a fin.

CHAPTER VII.

HOW TO "SPOT" ANY COMMON SNAKE.

First observe the snake carefully. Note its head—whether shielded or scaly, its belly—whether it has ventrals and, if so, whether they are narrow or broad. Count the rows of scales; note whether the vertebral series are larger than the others; note also if the scales are imbricate, and if keeled or smooth. Count the ventrals and sub-caudals and note whether the anal shield and sub-caudals are single or bifid. Then observe the length and general shape of the snake, its eye, any peculiarities in its head shields, etc. Lastly, turn your attention to its colour and markings.

By this time you will have easily placed the snake in one of the four groups. If it falls into either Group I, II or IV, a reference to Chapter V will easily enable you to give it a name. If it falls into Group III and is a poisonous snake, the information given in the last chapter, together with that in Chapter VI, will again readily reveal its identity.

The real difficulty lies in recognising the numerous snakes included in "Group III, Sub-Group A—Harmless."

To search through all these, even in this little book, from which all but the common ones have been eliminated is a wearying task, so I have devised the following key, based on the number of scales possessed by a snake. In most snakes, though not in all, this number is a constant feature. A reference to Chapter V will enable the reader to distinguish between snakes having the same number of scales, and to make this easier, I have added a few other distinguishing points in the key.

If, in spite of this key, the snake cannot be identified the only thing left is to go carefully through the descriptions of the whole lot, as the specimen may be one with an abnormal number of scales. If, even then, it is not found it is not a common snake; but the ordinary reader, for whom this book is meant, is very unlikely to meet with uncommon snakes. They are generally only found by the naturalist or zoologist who makes special and systematic search for them and to whom this book would be of no use or interest.

Remember, although the colour is of the greatest use in finally identifying the specimen, never to go for the colour first and never rely on the colour alone.

KEY TO THE SNAKES IN GROUP III, SUB-GROUP A. (*Harmless snakes with shielded heads and broad ventrals.*)

SCALES 15—

1. THE BLUNT HEADED SNAKE (*Amblycephalus monticola*).

   Vertebrals enlarged. No mental groove

Page 17

2. (*No English name*) ABLABES CALAMARIA.
   A small snake ... ... Page 18
3. THE VARIEGATED KUKRI SNAKE (*Oligodon subgriseus*).
   A small snake ... ... Page 19
4. THE SLENDER DHAMAN (*Zamenis korros*).
   Grows to about 6 feet, only common in Burma ... ... Page 25
5. THE WHIP SNAKE (*Dryophis mycterizans*).
   Enlarged vertebrals, horizontal pupil; very slender and long, with long snout and flexible appendage. Green colour. Page 32
6. THE BUFF WHIP SNAKE (*Dryophis prasinus*).
   Similar to above but without appendage. Only found in Burma ... Page 33
7. THE BRONZE-BACK TREE SNAKE (*Dendrophis pictus or Dendrelaphis tristis*).
   Vertebrals enlarged, has keeled ventrals. Bronze or blue in colour ... Page 33

SCALES 17—

1. (*No English name*) SIMOTES ARNENSIS.
   About 1 to 2 feet. Has distinctive head markings ... ... Page 20
2. THE CORAL TAIL SNAKE (*Simotes cruentatus*).
   Found only in Burma ... Page 21
3. THE COMMON WOLF SNAKE (*Lycodon aulicus*).
   Not more than 2 feet in length. Chocolate brown with white or yellow cross-bands Page 21
4. THE DHAMAN OR RAT SNAKE (*Zamenis mucosus*)
   A large, stout snake often more than 6 feet in length ... ... Page 24

5. The Golden Tree Snake (*Chrysopelea ornata*).
   Ventral keels. Black and yellow or golden colour ... ... Page 34
6. The Burmese Brown Tree Snake (*Dipsadomorphus multimaculatus*).
   Enlarged vertebrals ... Page 36
7. The Sind Sand Snake (*Psammophis schokari*). 36
8. The Desert Snake (*Psammodynastes pulverulentes.*)
   Vertical pupil. Chiefly found in Burma. Page 37

Scales 19—

1. (*No English name*) Simotes cyclurus.
   Found only in Burma ... „ 21
2. The Red Dhaman (*Coluber radiatus*).
   Grows to 6 feet. Chestnut colour. A Burmese snake... ... Page 23
3. (*No English name*) Zamenis ventrimaculatus.
   A sub-ocular scale present ... Page 25
4. The Checkered Keel-back (*Tropidonotus piscator*) ... ... Page 28
5. The Buff-striped Keel-back (*Tropidonotus stolatus*).
   The conspicuous buff stripes along the back are very distinctive ... Page 28
6. The Himalayan Keel-back (*Tropidonotus platyceps*) ... ... Page 30
7. The Olivaceous Keel-back (*Helicops schistosus*) ... ... Page 30
8. The Burmese Brown Tree Snake (*Dipsadomorphus multimaculatus*).
   Vertebrals enlarged ... Page 36

Scales 21—

1. (*No English name*) Simotes cyclurus.
   A Burmese snake ... Page 21
2. (*No English name*) Zamenis fasciolatus.
   Has scale-like temporals and small scales between the sublinguals ... Page 26
3. The Common Brown Tree Snake (*Dipsadomorphus gokool*) ... ... Page 35

Scales 23—

1. (*No English name*) Zamenis faciolatus.
   Scale-like temporals and small scales between the sublinguals ... Page 26
2. The Green Keel-back (*Macropisthodon plumbicolor*).
   Green colour ... ... Page 31

Scales 25—

1. (*No English name*) Zamenis diadema.
   Has several sub-oculars ... „ 27
2. The Green Keel-back (*Macropisthodon plumbicolor*).
   Green in colour ... ... Page 31

Scales 27—

1. (*No English name*) Zamenis diadema.
   Has several sub-oculars ... „ 27
2. The Green Keel-back (*Macropisthodon plumbicolor*).
   Green in colour ... ... Page 31
3. The Little Trinket Snake (*Coluber Helena*).
   Page 22

Scales 29, 31, 33—

(*No English name*) Zamenis diadema „ 27

CHAPTER VIII.

SOME GENERAL REMARKS ABOUT SNAKES.

I think that most of the interest aroused by snakes is due to the power some of them possess of dealing death—swift, silent and terrible. On this account they, not unnaturally, inspire a feeling of dread and horror.

However, not all poisonous snakes are deadly. Of the poison of the coral snakes little or nothing is known. They probably are quite incapable of killing a man. Most of the pit-vipers are incapable of inflicting a deadly wound on man. The Banded krait of Burma is probably not, as a rule, fatal to man. The common krait is a deadly snake and so is Russell's viper, and unfortunately the cobra, one of the commonest of all snakes, is very deadly.

The actual danger from snakes is not very great. I am sure that the statistics published concerning deaths from snake-bite are very far from being accurate, but even if they were correct the death-rate of the Indian population from snake-bite would be very small, and among Europeans death caused by snake-bite is very rare indeed.

In estimating the value of cures for snake-bite we must consider several points. All snakes are not poisonous, and as very few people can tell a poisonous from a non-poisonous snake, the person cured may have been bitten by a harmless snake. Again, all poisonous snakes are not fatal to man ; and most important of all, a deadly snake does not always inflict a fatal wound.

The snake may not be "in good form" for killing, or he may have just previously bitten something else and exhausted his poison or he may get his teeth in and yet inject no poison. There is a case on record in which four men were bitten by the same krait ; the first three died but the fourth recovered.

There are in fact many cases recorded of a man being bitten by an undoubtedly deadly snake and showing no ill-effects, or recovering without any special treatment. The fact is that the snake does not *always* inject its poison when it bites.

The poison is injected by the snake's poison-fang into the blood, just as a doctor injects a drug or serum with a hypodermic syringe. The blood carries the poison to all parts of the body. So the first and most important thing to do to a person bitten by a snake is to tie a ligature tightly round the limb above the bite. Then cut into the bite and let the wound bleed freely and suck it to try and draw the poison out. Some powdered permanganate of potash may also be rubbed into the wound, supposing that any is available. Hurry the patient off to a hospital and the doctor there will give an injection of anti-veneme which may save the patient if only it can be given soon enough. But it must be given soon after the bite to be of any use. Then the doctor will watch for symptoms and combat them as they arise, giving heart stimulants, such as brandy and strychnine for failing circulation, doing artificial respiration if the breathing fails, and so on.

I am very sceptical about native remedies. In my experience natives know nothing about snakes, neither the educated Indian nor the jungle-dweller nor shikari. They invariably pronounce them all deadly, and generally have some tall story to tell for which there is not the slightest foundation in fact.

The snakes used by the ordinary Indian juggler and snake-charmer are all harmless as they have had their poison glands removed, but there are numerous instances on record of snake-charmers and other natives being killed by allowing deadly snakes to bite them under the delusion that they were immune owing to some charm or that they had an infallible cure. Natives as a rule are a credulous lot and their stories

of immunity and of cure must be taken with even more than the proverbial pinch of salt.

When all is said and done however there are instances on record of competent observers recording their personal experiences of the apparent efficiency of snake stones, charms and such like things. And if the facts are really as they appear to be, it is difficult to offer any explanation. One of the most reasonable is the theory that these professional snake charmers have gradually inoculated themselves with, at first, minute and then gradually increasing doses of snake poison, thus rendering themselves immune; on the same lines that a man is rendered immune to enteric fever poison by being inoculated; or animals in the pathologist's laboratory are rendered immune to various organic poisons such as diphtheria.

But I cannot too strongly impress on my reader that the statements of Indians* about snakes is hardly ever worth anything: either with regard to their poisonous properties or their general habits or characteristics. The harmless little Lycodon is always declared deadly.

A stumpy tailed cobra generally elicits an account of how the cobra loses an inch of its tail every time it bites a man. As a matter of fact many snakes lose part of their tails, due probably to having them bitten off by a mongoose.

Another instance of the native's ignorance and credulity is the widespread belief in the existence of a poisonous lizard which they call the "bis-cobra." Many harmless lizards of varying size have been brought to me with tales of their fearful lethal powers. I believe I am right in saying that there is no poisonous lizard known to zoologists.

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* The average European knows very little about snakes also, but as a rule he does not pretend to do so. The native, especially the shikari and jungle-dweller, seems to be expected to know something, and although he is quite ignorant of snakes, he always pretends to know when asked.

It is almost unnecessary to say that there is no such thing as a double-headed snake, *i.e.*, a snake with a head at each end of its body. Native snake exhibitors, however, sometimes display what they call double-headed snakes. They manufacture these by mutilating the stumpy tail of the *John's Earth Snake.*

There is in fact a general tendency to exaggerate when talking about snakes. It must be admitted that they are rather uncanny beasts but one must be on one's guard when listening to tales of them. Who has not heard marvellous stories of how they fascinate their victims, yet this power appears to be quite mythical.

Many people say and believe that they have killed cobras over 6 feet long. I have never seen one over 5 feet 3 inches, and Nicholson states that his largest specimen was 5 feet 8 inches, and that out of 1,200 which he examined there were only four over 5 feet 6 inches. There are very few authentic records of cobras measuring more than 6 feet.

The length of pythons too is very apt to be exaggerated, due perhaps, as Nicholson suggests, to the proportionately great thickness of the body. The stories of pythons eating goats and deer, etc., have apparently no foundation in fact. Rats and small birds are more suited to the capacity of the jaw of the ordinary python.

Fearsome tales are extant about the *Hamadryad* or *king cobra,* and a deadly poisonous snake, ten or twelve feet long, must be a rather terrible beast. Wall says it is known to show a most aggressive spirit and quotes a case of one making an unprovoked assault on a cooly woman, holding on to her leg for several minutes till it had to be beaten off. Nicholson says it is very savage when watching its eggs and will drive away any passers-by, but that at other times it is peaceable enough. It is evident, therefore, that the Hamadryad is a somewhat formidable animal, but there is no excuse for the ridiculous

nonsense one hears and sometimes reads about it, such as its swallowing men whole and then twisting itself round trees to crush the victim inside it.

Snakes reproduce their species by laying eggs. In some snakes the embryo is developed after the egg is laid (oviparous), in others the egg contains a perfectly developed fœtus (viviparous) and there are various gradations between the two. The term "viper" was originally given to all venomous snakes, because it was thought that these were all viviparous while all harmless snakes were thought to be oviparous. This is now known to be erroneous. Many harmless snakes are viviparous while some poisonous ones, *e.g.*, the cobra, are oviparous.

At birth the young snake is about one-sixth of the adult length, *e.g.*, the cobra, adult length 66 inches, at birth 11 inches; the Dhaman, adult length about 8 feet, at birth $15\frac{1}{2}$ inches.

Snakes grow rapidly during their first year of life, more than doubling in length. They are said to reach maturity at their fourth year.

Snakes are said to cast their skins on an average about every two months. The loose skin on the nose and chin is fixed to some object and the snake crawls out of the skin leaving it, of course, inside out.

I think I am right in saying that all snakes can swim. At any rate, when a snake is seen in the water it must not be assumed that it is necessarily a water snake. Most land snakes take to the water readily and may often be seen swimming in rivers and tanks. They also drink water freely.

Snakes brought to one for examination are frequently much damaged by being hammered about the head and body in the endeavours to kill them. A smart blow or two with a light cane in the middle of the back is generally quite enough to finish off a snake. If caught alive it may be

killed by having a few drops of oil from a dirty tobacco pipe inserted into its mouth ; or more quickly and certainly by passing a little carbolic acid down its throat by means of a glass pipette.

In conclusion, I would warn my readers, in the words of Nicholson, against "the eagerness of people to look for the marvellous in all that concerns snakes." He says, "the safest plan is to believe nothing that you hear;" and as regards anything the ordinary native has to say about them, I am sure this is sound advice.

APPENDIX

For the head shields of snakes I have used the names given in Major Wall's book. Nicholson uses a different nomenclature and for the convenience of those who use his book in addition to Wall's or this one, I append the following list giving Nicholson's names where they differ from Wall's :—

WALL'S.	NICHOLSON'S.
Internasal.	Anterior frontal.
Præ-frontal.	Posterior frontal.
Frontal.	Vertical.
Parietal.	Occipital.
Occipital.	*None.*
Supra-ocular.	Super-ciliary.
Supra-labials.	Labials.
Infra-labials.	Lower labials.
Anterior sublingual.	Geneial or gular.
Posterior sublingual.	Ditto.

The remainder of the names used for the head shields are the same in each book.

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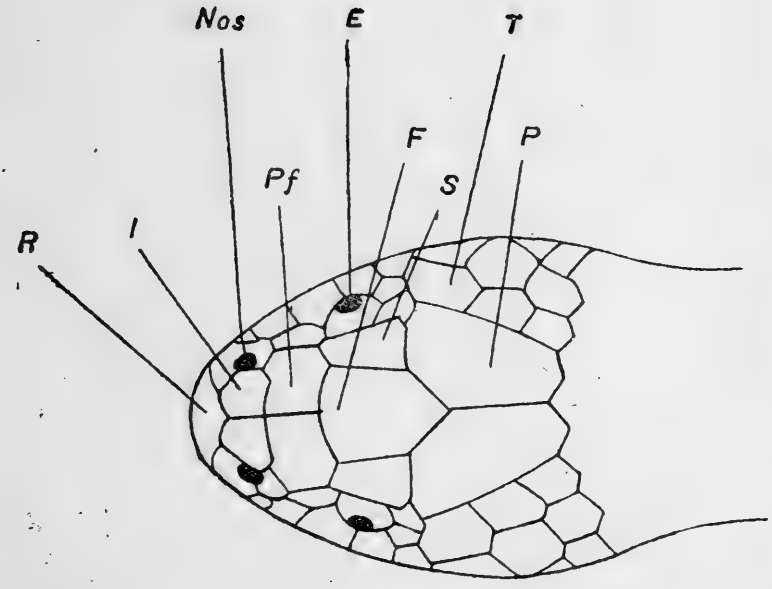

FIGURE 1.

The crown or top of the head of a typical snake to show head shields.

Nos. = nostril.
E = eye.
R = rostral.
I = internasal.
Pf. = præ-frontal.
F = frontal.
S = supra-ocular.
P = parietal.
T = temporal.

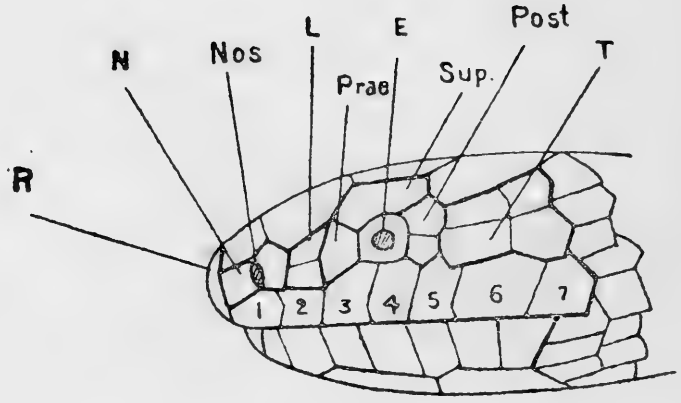

FIGURE 2.

Side view of the head of a typical snake to show head shields.

N = nasal.
Nos. = nostril.
L = loreal.
E = eye.
Præ. = præ-ocular.
Sup. = supra-ocular.
Post. = post-ocular.
T = temporals.
R = rostral.
1, 2, 3, 4, 5, 6, 7 = first, second, etc., supra-labials.

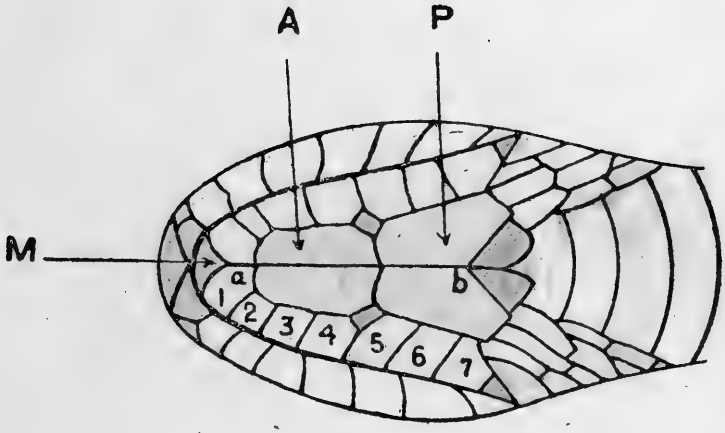

FIGURE 3.

The under surface of the head of a typical snake to show head shields.

M	=	mental.
A	=	anterior sub-lingual or chin-shield.
P	=	posterior do. do.
1, 2, 3, 4, 5, 6, 7	=	first, second, etc., infra-labials.
a to b	=	mental groove.

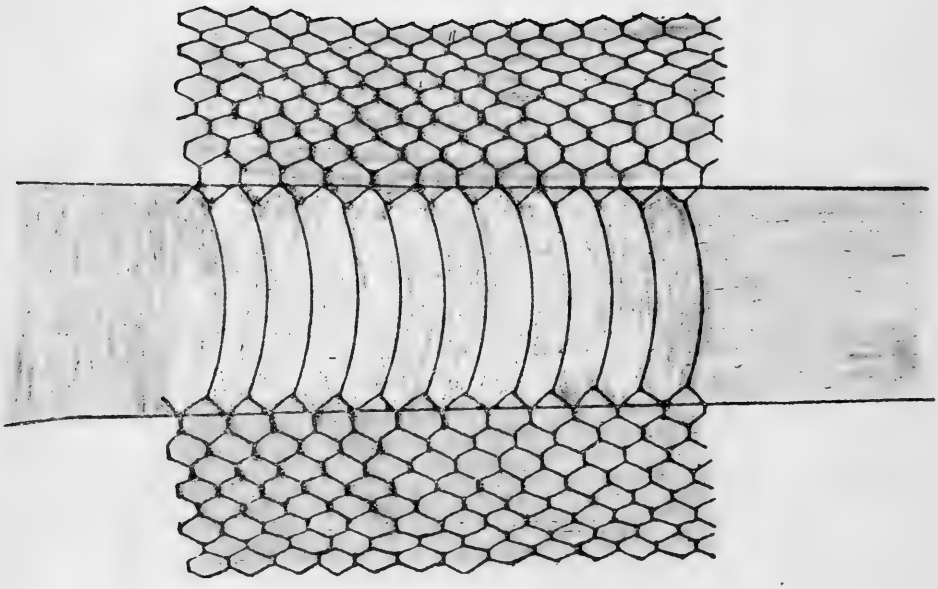

FIGURE 4.

Skin of typical snake, showing the broad ventrals on the belly. When the snake is lying on its back only that part between the lines is visible.

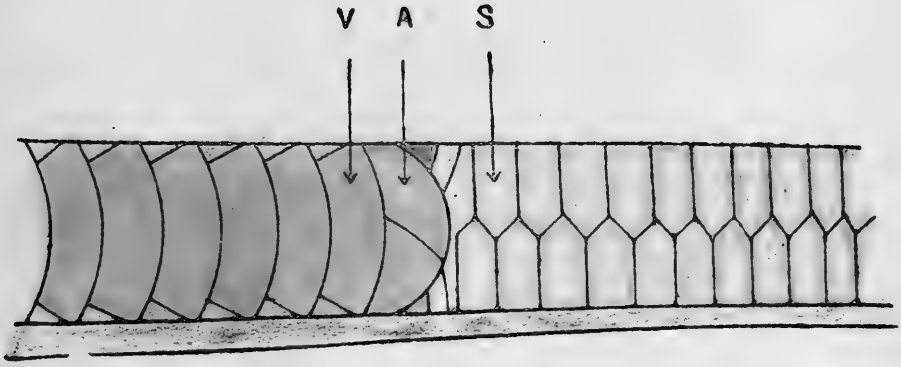

FIGURE 5.

Belly of a typical snake at the region of the anus or vent.

V = ventral shield.
A = anal shield (divided).
S = sub-caudal shield (divided).

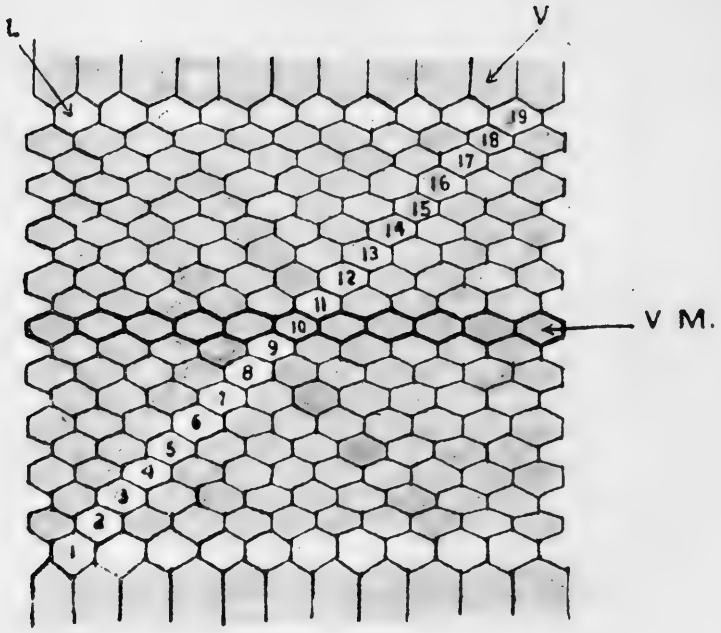

FIGURE 6.

Skin of a typical snake, showing the back and sides, covered with scales.

The method of counting the scales across the body is indicated (1, 2, 3, etc.).

V M = the vertebral row of scales.

L = the last row of scales.

V = commencement of the ventral shield.

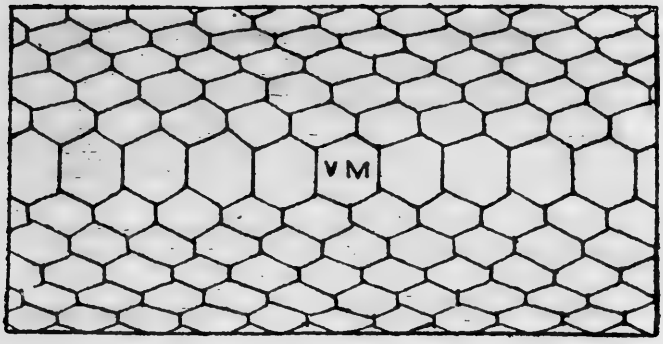

FIGURE 7.

Back of the krait showing vertebral row of scales (V M) enlarged.

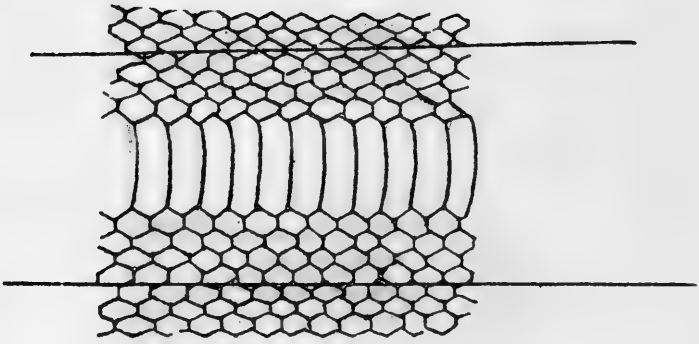

FIGURE 8.

Skin of a snake (*e.g.*, a python or earth snake) showing narrow ventrals.

When the snake is lying on its back only that part between the lines is visible.

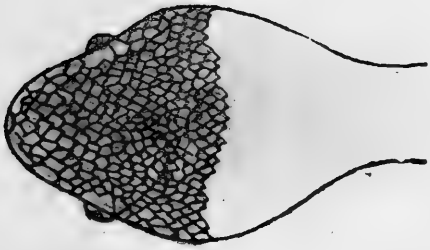

FIGURE 9.

Head of a Viper illustrating a scaly head.

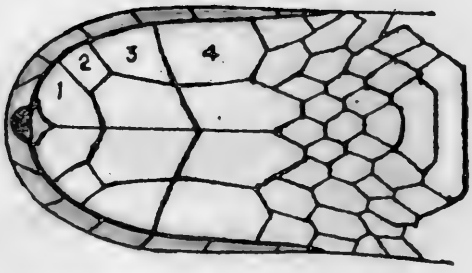

FIGURE 10.

Under surface of the head of a krait, showing only four infra-labials, the fourth (4) being the largest.

NOTE.—The definition of the *last* infra-labial on page 49.

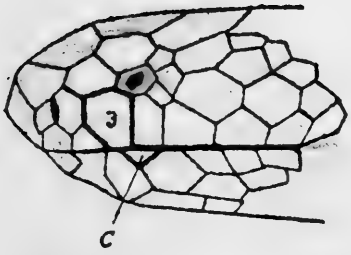

FIGURE 11.

Side view of the Head of a Cobra

3 = third supra-labial touching both the nasal shield and the eye.

C = the cunate shield.

INDEX.

ERRATA.

Page 8, line 17, *for* specimens *read* specimen.
,, 14, ,, 7, ,, pots *read* spots.
,, 24, in foot-note, *for mucosuso* read *mucosus*.
,, 26, ,, 12, ,, Faciolatus *read* Fasciolatus.
,, 39, ,, 8, ,, Branded *read* Banded.
,, 40, ,, 31, ,, Hamadrayad *read* Hamadryad.
,, 46, ,, 18, ,, common viper *read* common Green viper.
,, 54, ,, 10, ,, Faciolatus *read* Fasciolatus.
In diagram, Fig. 10, in note *for* 49 *read* 4.