



MADRAS GOVERNMENT MUSEUM

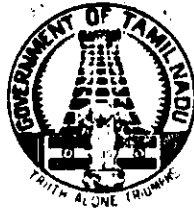
GUIDE TO

THE SNAKES EXHIBITED IN THE REPTILE GALLERY

BY

S.T. SATYAMURTI, M.A., D.SC., F.Z.S.
Superintendent, Government Museum, Madras

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P R E F A C E

The Government Museum, Chennai, had started acquiring zoological specimens from 1856 onwards. At present, since the Reptile Gallery consists of specimens of indigenous animals, a student or a layman gets a fairly complete picture of South Indian fauna of snakes. Apart from collection, preservation, display arrangements and interpretation of the exhibits in the galleries, a great deal of effort had been concentrated on various other fields of museum activity, such as the building up of reserve collection for faunistic surveys for research and reference purposes, the publication of the results of these researches in a valuable series of guide books and bulletins. It is believed that this guide book will meet all the needs of students and other visitors and prove to be useful to them.

Chennai - 8.
11.02.1999


(**S. Rangamani, I.A.S.**)

GUIDE TO THE SNAKES EXHIBITED IN THE REPTILE GALLERY OF THE MADRAS GOVERNMENT MUSEUM

The Reptile Gallery of the Madras Government Museum is accommodated in a rather narrow, rectangular hall adjoining the large General Gallery in which the skeleton of the Whale and other comparative skeletal structures are exhibited. Snakes occupy a prominent place in the Reptile Gallery, and almost all the specimens of snakes exhibited in this gallery belong to South Indian species. They consist of wax and plaster casts, as well as actual specimens preserved in alcohol and mounted in jars or as dry skins spread out in glass frames.

The section of the Reptile Gallery devoted to snakes commence with a small group of exhibits near the wooden staircase leading to the first floor, at the front end of this gallery. This group consists of plaster and wax casts of the four main types of poisonous snakes found in India, namely, the Cobra, Krait, Russell's Viper and Sea Snake, together with a few common non-poisonous snakes such as the common Wolf Snake, which show a superficial resemblance to the poisonous snakes and are commonly mistaken for them.

Adjacent to this case are exhibited charts to distinguish the poisonous from the non-poisonous snakes. A simple method of distinguishing the poisonous snakes, at least among the Indian forms, is to see whether a snake has one or other of the following features which are characteristic of the main types of poisonous snakes met with in our country: (1) A prominent hood with a spectacle mark is present behind the head and the third supra-labial shield touches both the eye and the nostril (Cobras); (2) the middle row of scales on the back (vertebral scales) are enlarged (Kraits); (3) the head is covered with numerous small, overlapping scales and is distinctly marked off from the rest of the body by a well defined constriction at the neck behind the head (Vipers); and (4) the tail is laterally flattened and oar-shaped (Sea Snakes). If an Indian snake has none of the above characters, it may be safely assumed that it is a harmless one, and it is well to remember that the majority of our snakes are not poisonous, and in fact some, such as the Dhaman or Rat Snake are even beneficial to man helping to keep down pests such as field rats, mice, etc. The indiscriminate killing of all species of snakes should therefore be avoided.

Next to these diagnostic charts, is an enlarged diagram to illustrate the mechanism of the automatic erection of the poison fangs in the Vipers when the mouth is opened. An enlarged painted model of the head of a poisonous snake exhibited next to it illustrates clearly the structure of the poison glands and the fangs, and how the poison is conveyed from the gland to the root of the fangs.

by means of the poison duct when the muscles surrounding the gland contract, compressing it and squeezing out the poison.

A skeleton of the Cobra exhibited beneath this model helps to illustrate how the elongated ribs near the neck enable the hood to be spread out at will by their erection. The ribs in snakes also help in locomotion by causing the movement of the abdominal muscles to which their ventral tips are attached.

In the central part of the Reptile Gallery an entire case is set apart for the display of a series of painted wax casts of some of the more common South Indian snakes, both poisonous and non-poisonous, arranged and labelled so as to serve as an introductory series to the various families of snakes represented in South India. General explanatory labels on the classification, feeding habits, locomotion and reproduction of snakes in this case furnish much useful information. As these casts are, as far as possible, painted in colours true to Nature, they give a much better idea of the real colour of the snakes than the actual specimens preserved in spirit jars in which the colour fades to a varying degree sooner or later.

In addition to the above series, two large plaster casts, one of the Cobra and the other of the Rat Snake, and one brightly coloured wax cast of the Banded Krait, are exhibited in adjoining cases on artificial groundwork. The exhibit of the Rat Snake is specially interesting as it is shown coiled around a small artificial pool abounding in tank frogs on which the Rat Snake largely feeds; and the vividly banded specimen of the Banded Krait arrests the attention of the visitor as a striking example of warning colouration in Nature.

In one of the central cases in this Gallery is exhibited a medium-sized stuffed specimen of the Indian Python or Rock Snake, *Python molurus* (Tamil : *Malai pambu*), which is the largest among Indian snakes. The skin of a much larger specimen of this species which may attain a size of over twenty feet in length, may be seen mounted in a glass frame on the wall in this gallery. The Python is non-poisonous, but kills its prey by coiling around it and constricting it to death. It is capable of capturing and swallowing animals much larger than itself. Sometimes animals as large as a deer or a pig are known to have been swallowed by Pythons. The Indian Python is largely an inhabitant of the jungle, especially on the rocky slopes of low hills.

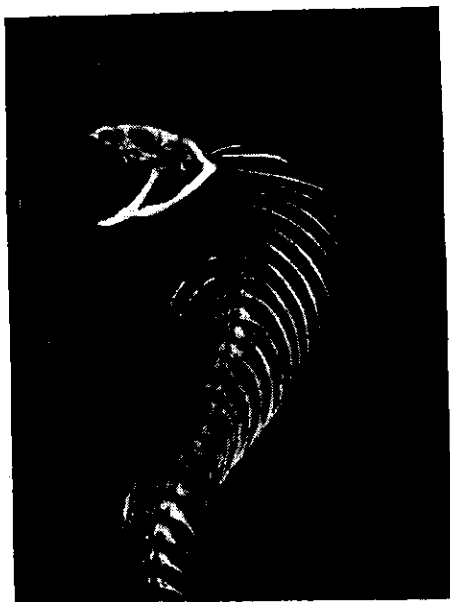
In the adjoining case are exhibited the skulls and skeletons of the Python and the Russell's Viper and the eggs and small spur bones of the Python, which are of special interest as they support the 'spurs' which are the only vestigial remnants of the hind limbs found among living snakes to-day. The skeletons exhibited in this case serve to illustrate how, in the absence of limbs, progression is effected in snakes by means of the numerous ribs which are attached to the abdominal muscles at their lower ends. In



Fig. 1 FANGS OF VIPER.



Fig. 2 ENLARGED MODEL OF THE HEAD OF A POISONOUS SNAKE.



**Fig. 3 SKULL AND RIBS OF THE HOOD OF COBRA SHOWING
HOW THE COBRA SPREADS ITS HOOD.**

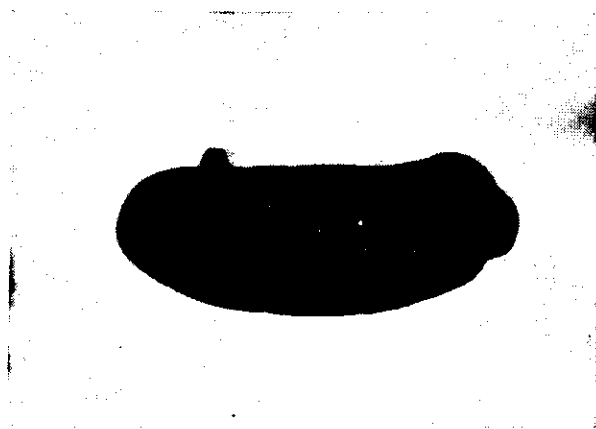


Fig. 4 PYTHON MOLURUS: THE ROCK SNAKE.

fact, snakes "run", in a sense, on the extreme points of their ribs, which are moved forwards, carrying with them the ventral shields to which they are attached.

SPIRIT-PRESERVED SPECIMENS OF SNAKES.

The large array of snakes preserved in alcohol and mounted in tall glass jars along the wall with appropriate classificatory labels gives the visitor a fairly complete picture of South Indian snake fauna, systematically arranged in the order of their respective families, commencing at the extreme left. The more common and better known forms are briefly described below :—

Non-poisonous Snakes.

Family TYPHLOPIDAE.

This family includes small, degenerate snakes, popularly known as worm snakes or blind snakes. They live underground or in decaying wood and vegetation, being capable of burrowing rapidly in soft earth. Their body is cylindrical and worm-like and covered uniformly with small, smooth, highly polished scales which strongly overlap. Specimens of both the common South Indian species, namely, *Typhlops brahminus* and *Typhlops acutus*, are exhibited. *Typhlops acutus* is known as the Beaked Blind Snake, as the snout is pointed and hooked, in the form of a projecting beak. *Typhlops brahminus* is known in Tamil as *Sevi-pambu* (Ear Snake) owing to the fact that it sometimes enters the ears of human beings.

Family UROPELTIDAE.

Snakes popularly known as Rough-Tails are included in this family. These snakes inhabit mountainous districts, often at very high altitudes, lying under logs or stones or buried in the earth. They can burrow quickly in soft earth. They are distinguished by a rigid, cylindrical body and a very short tail, which, in the genus *Rhinophis* and some species of *Uropeelts*, is obliquely truncated and shield-shaped. In a few such cases this tail 'shield' is said to serve as a stopper to plug the entrance to the hole where the snake has burrowed.

Several specimens belonging to species of *Platyplecturus*, *Melanophidium* and *Uropeelts* are exhibited.

The *Uropeelts* are quite and inoffensive in their disposition and seldom bite when handled. They feed chiefly upon worms and soft-bodied larvæ of insects. All species are viviparous bringing forth three to eight young ones at a time.

Family BOIDAE.

Apart from the specimen of the Indian Python already referred to, this family is represented by two common species of Sand Bosc among the spirit-preserved specimens of snakes. They are the Russell's Sand Boa (*Eryx conicus*), distinguished by a reticulated pattern of black markings, and John's Sand Boa (*Eryx johani johani*) which is uniformly pale, sandy brown above and whitish below, or almost entirely brown. This snake bears two small reddish spots near the tail, resembling the eyes. This has given rise to the popular belief (though false), that this snake changes its head from one end of the body to the other every six months alternately, and hence the popular name in Tamil, *Iruthalai Pambu*. They are sluggish, inoffensive snakes, inhabiting dry, sandy areas and kill their prey by constricting before swallowing. They feed on small mammals, birds, snakes and frogs. From six to eight young are produced at a time.

Family COLUBRIDAE.

All the remaining specimens of non-poisonous snakes in the spirit-preserved systematic series in this gallery belong to the large family Colubridæ. Formerly, even the poisonous snakes such as Cobras and Kraits were included in this family, but in the modern classification of snakes, these have been separated into a distinct family, the Elapidæ. In snakes of the family Colubridæ the teeth are solid, or only the posterior two or three teeth are grooved.

A wide range of species of harmless snakes such as Rat Snakes, Trinket Snakes, Wolf Snakes, Bronze-backs, Tree Snakes or Whip Snakes, Keel-backs, Cat Snakes, etc., included in this family occur in South India, and are represented in the present series. The habits of some of the more important and better known species among these are briefly outlined below :—

THE TRINKET SNAKE (*Elaphe helena*) (Tamil : *Kattu Pambu*) is a brownish snake readily distinguished by the presence of two longitudinal black stripes on the neck. It is extremely active and possesses a vicious temper. It feeds mainly on small mammals such as rats, but lizards, frogs and snakes are also eaten. When excited, it assumes a defensive attitude. It is usually found in or near jungle, though occasionally it strays into well populated areas.

THE RAT SNAKE OR DHAMAN (*Ptyas mucosus*) (Tamil : *Sarai pambu*).—This snake attains a large size and is widely distributed throughout the whole of India. It is mainly an inhabitant of the plains, frequenting the open country, often in the vicinity of human dwellings. It is diurnal in its habits and generally timid in disposition. In spite of its name its main food does not consist of rats,



FIG. 6 PYTHON MOLURUS: THE ROCK SNAKE.

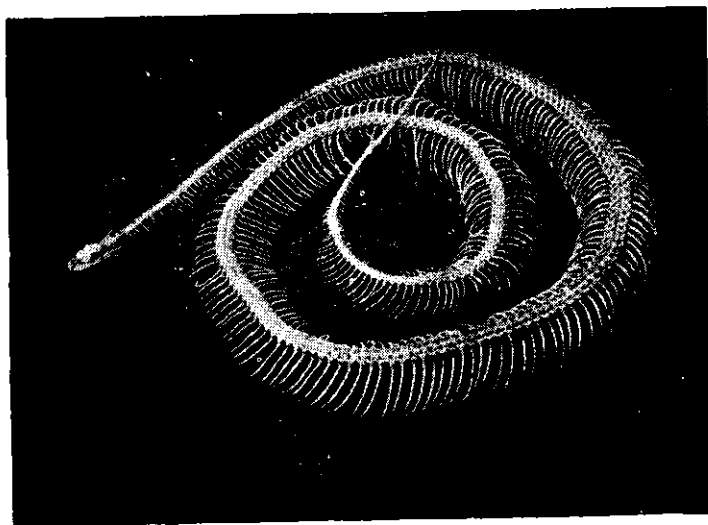


FIG. 6 SKELETON OF PYTHON.



FIG. 7 *ERYX JOHNI*: JOHN'S SAND BOA.

but of frogs and toads, though it also feeds on lizards, and occasionally on snakes and young birds. The eggs are large, and about six to fourteen of them are laid in August and September. The flesh of this snake is sometimes eaten by natives both in India and in Indo-China. The popular belief that the Rat Snake mates with the Cobra is of course a misconception which has arisen from the fact that the two snakes are sometimes found in close association.

THE KUKRI SNAKE and its allies (*Oligodon* spp.).—Several species of this genus, formerly known as *Simotes*, are represented in the exhibited series of snakes in this gallery. In disposition most of these snakes are quiet and inoffensive. Several species of this genus are prettily ornamented with brilliant colour markings. The Common Kukri Snake (*Oligodon arnensis*), with bright black cross bars on the back is a familiar example of this group. All the species lay eggs, about three to six being the usual number. The larger species feed on small mammals, birds and lizards; they are particularly fond of the eggs of birds and reptiles and the spawn of frogs. The small species feed also upon insects, grubs and spiders.

THE BRONZE-BACKS (Genus *Ahaetulla* = *Dendrophis* or *Dendrelaphis*).—The Bronze-Backs are a group of tree-dwelling snakes, many of them with a strikingly beautiful colouration. They live almost entirely among the branches of trees and bushes and descend to the ground only in search of food. Their prey consists chiefly of frogs and lizards, though toads and insects are also sometimes eaten.

THE COMMON INDIAN WOLF SNAKE (*Lycodon auticus*) (Tamil. *Komberi-Mukkan*) is one of the commonest tree snakes of Southern India. It is bronze-brown or purplish brown above and light greyish or yellowish below with a more or less distinct chestnut-coloured stripe along each side, edged or spotted with black. It is extremely rapid in its movements, but is shy and timid in disposition and does not bite when handled. Another species, *Ahaetulla grandoculis* from Wynaad is also represented among the exhibited Snakes.

THE GOLDEN TREE SNAKE (*Chrysopetes ornata*) is another common tree snake found throughout Southern India and Ceylon and has often been found near human habitations. It is diurnal in habits and feeds on lizards, small mammals, birds, snakes and even insects, in fact on anything which it can overcome. This snake possesses remarkable powers of climbing and springing among the branches of trees and can also glide short distances by stiffening its body and hollowing out its belly.

WOLF SNAKES (*Lycodon* spp.).—Some of the commonest of the harmless snakes belong to this group. Most members of this group are excellent climbers. They are nocturnal in their habits, extremely active in their movements and generally very vicious in their temperament, biting under the least provocation. They feed

mainly on lizards, but small mammals such as mice are also eaten. All the species are oviparous, the eggs being elongate.

THE COMMON INDIAN WOLF SNAKE (*Lycodon auticus*) (Tamil: *Valapanayan* or *Suvar Pambu*) is the commonest and most widely distributed of all the Indian Wolf Snakes. It frequently enters human habitations. It is very variable in its colouration, but the variety most commonly met with is light brown with white cross bars which expand laterally. Its chief food consists of Geckos, but other lizards, mice and frogs are also eaten. It is extremely active in its movements and when chased or cornered it strikes boldly and viciously at its enemy.

Two other species, *Lycodon striatus*, which is comparatively timid in disposition and is distinguished by its darker and more reticulated form of colour pattern, and *Lycodon travancoricus*, a dark purplish brown snake with yellow cross bars, recorded from the Western Ghats, Wynaad and Nilgiris, are also represented in the exhibited series of snakes in this gallery.

THE BRIDAL SNAKE (*Dryocalamus nympha*).—This snake, known popularly as the Bridal Snake, on account of the yellow mark on the back of the head which suggests a bridal veil, is coloured glossy dark brown or blackish brown on the back, fading somewhat towards the tail. These are moderately small snakes of timid disposition, nocturnal in habit, and have been frequently found in and around human habitations. They are good climbers, and when captured, have the habit of twisting their bodies into knots. They feed on lizards.

THE CHECKERED KEELBACK (*Natrix piscator*) (Tamil: *Thannu Pambu*).—This is one of the commonest of South Indian non-poisonous snakes and is confined mostly to the plains. It is diurnal in habits, and extremely active in its movements. It bites viciously and springs fiercely at the enemy when cornered. Its food consists mainly of frogs, tadpoles and fish. It owes its popular name to the characteristic checkered pattern of dark spots on its back. Its scales are strongly keeled. It is often found in pools and puddles, swimming actively in the water. It is oviparous, laying a very large number of eggs.

THE STRIPED KEELBACK (*Natrix stolata*) (Tamil: *Nikkattan Kutty* or *Nikkattan Pambu*; *Olai Pambu*).—This snake is olive greenish or brownish above, with a buff stripe passing down each side of the back. It is common in many parts of India and Ceylon, both in the plains and in the hills. It is diurnal in its habits and very timid and inoffensive in its disposition. Its food consists mainly of frogs and toads, and during the rains, it may be found all over grassy and cultivated areas of open country. It sometimes wanders into human dwellings.



Fig. 8 PTYAS MUCOSUS : THE RAT SNAKE.

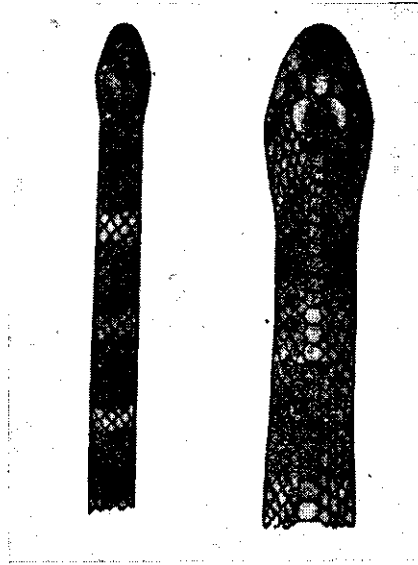


Fig. 9 LYCODON AULICUS: THE WOLF SNAKE.

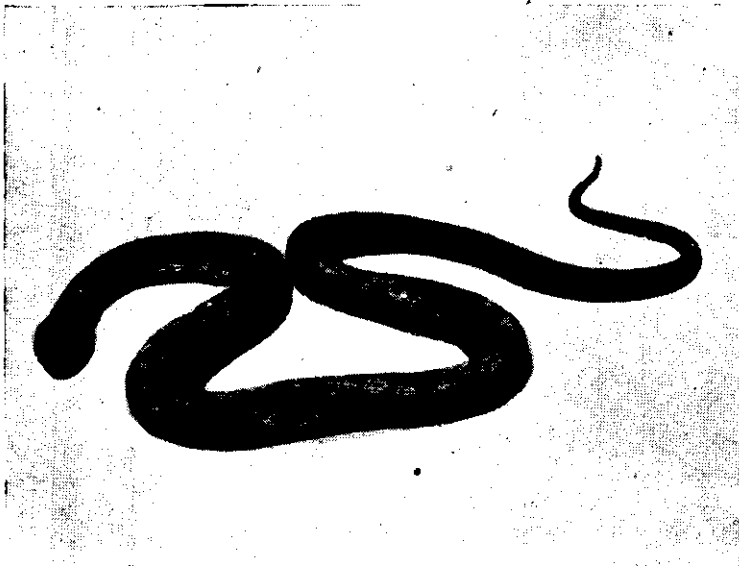


Fig. 10 NATRIX PISCATOR: THE CHECKERED KEELBACK.

•A third species, *Natrix beddomei*, distinguished by an olive brown ground colour, with a series of yellow spots, each one between two black spots or short transverse bars along each side of the back, is also represented in the present series. It is confined to the Western Ghats, Nilgiris and Wynnaad.

THE GREEN KEELBACK (*Macropisthodon plumbicolor*) (Tamil : *Pacha Naga*).—This is a small snake, about two and half feet in length, grass-green above, during life, with a few irregularly disposed black spots over the front part of the body. The grass-green colour changes into a dull olive-brown in alcohol. Young specimens have a large, A-shaped mark on the neck, its apex pointing forwards. This snake is common in hilly districts, and is one of the most gentle and inoffensive of South Indian snakes. When alarmed, it erects the front part of its body and flattens the neck like a cobra, which probably accounts for its Tamil name which means "green cobra". It feeds mainly on toads, particularly the common Indian toad, *Bufo melanostictus*.

THE OLIVACEOUS KEELBACK (*Atretium schistosum*).—This is a quiet and inoffensive snake inhabiting plains and low hills. It is diurnal in its habits and shows a strong liking for an aquatic environment. During the rains it is commonly found in moist grass land. Its food consists mainly of frogs and fish. When alarmed, the fore part of the body is raised and the neck flattened.

PERROTET'S DWARF SNAKE (*Xylophis perroteti*).—This is a brownish snake with small darker spots arranged longitudinally, or united to form stripes. The belly is dirty yellowish, spotted with black, or almost entirely black. It inhabits the hills in the southern part of the Western Ghats (Wynnaad to Tirunelveli). Very little is known about its habits.

CAT SNAKES (*Boiga* spp., formerly known as *Dipsadomorphus*).—Most of the Cat Snakes are nocturnal and are mainly arboreal in their habits. They prefer bushes and shrubs to high trees, and when at rest they usually coil themselves into a ball rather than lie extended as other snakes do. They are viviparous, and most of them are extremely vicious in their disposition and bite readily.

THE INDIAN GAMMA OF COMMON INDIAN CAT SNAKE (*Boiga trigonata*).—This is one of the commonest of Indian Cat Snakes and is found throughout India and Ceylon. It is essentially arboreal in habits. In disposition it is one of the fiercest of Indian snakes. At the least disturbance or provocation it assumes an attitude of defiance and prepares to attack boldly. Its method of striking is very characteristic. The head and front part of the body are raised, and prior to the stroke the body is inflated and deflated in great excitement and the tail is vibrated briskly. The stroke is delivered with determined vigour. Its food consists mainly

of lizards, particularly of the genus *Calotes* (Garden lizard), but small birds and mammals are also eaten.

WHIP SNAKES (*Dryophis* spp.).—These are tree snakes living chiefly among bushes and shrubs through which they are capable of gliding with great rapidity. They often descend to the ground in search of food which consists of lizards, birds and small mammals. All snakes of this genus are viviparous.

Two species of *Dryophis*, *D. dispar* and *D. nasutus* are fairly common in southern India, and are represented among the exhibited specimens, the former occurring in the Western Ghats, Anamalais and Kodaikanal Hills and the latter throughout Peninsular India.

THE COMMON GREEN WHIP SNAKE *Dryophis nasutus* (Tamil *Pachai pambu* or *Kannukuthi pambu*).—This snake is beautifully grass-green above, with a white or yellow line along the sides. It is one of the most familiar of South Indian snakes, and frequently enters gardens and groves near human habitations. It is usually reputed to be a gentle and inoffensive snake, but when handled, it has the habit of darting suddenly at one's eyes and this has given rise to its popular Tamil name, *Kannukuthi Pambu*. In captivity they generally remain motionless, keeping their forebodies slightly raised, which they sometimes keep gently swaying from time to time. Its food consists chiefly of lizards, small rodents and birds.

Fresh water Snakes.

Sub-family HOMALOPSINAE.

Of the true fresh water snakes, belong to the sub-family Homalopsinæ, the species *Cerberus rhyncops* and one or two others are perhaps the only ones recorded from South India, most of them occurring in Burma, Siam, Malaya and Indo-China. It is a brackish water snake, often found on coasts and tidal rivers of India. It is quiet and inoffensive in its disposition, but when taken on land it shows great activity and tries to escape. It feeds voraciously on fishes and has often been caught by anglers on their hooks. It is viviparous, producing about eight to twenty-six young at a time.

Poisonous Snakes.

Family ELAPIDAE.

This family includes the Cobras, Kraits and Coral Snakes. The characters of these snakes resemble those of the Colubridæ except in their dentition. This family (i.e., Elapidæ), together with the Hydrophiidæ and Viperidæ comprise the Proteroglyphous group of snakes which have poison fangs at the front end of the maxilla. The poison fangs bear a channel through which the poison runs



Fig. 11 DIORAMA SHOWING PAIR OF COBRAS WITH EGGS LAID IN TERMITE'S NEST.



Fig. 12 BUNGARUS CAERULEUS: THE KRAIT.

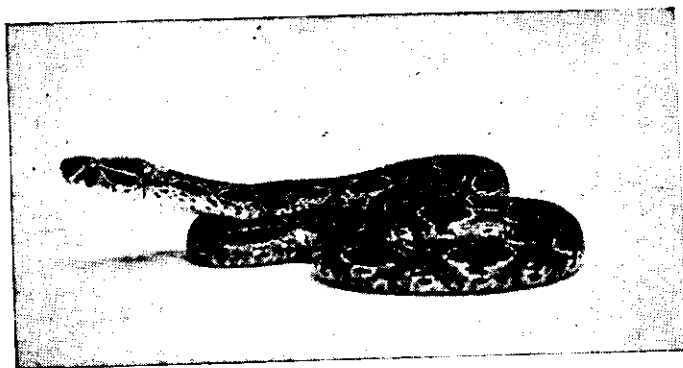


Fig. 13 VIPERA RUSSELLI: THE RUSSELL'S VIPER.

down from the poison glands and their ducts. The Elapidæ are found throughout the tropical and subtropical regions of the world.

THE COBRA (*Naja naja*) (Tamil: *Nalla Pambu*) is perhaps the best known among the poisonous snakes of India. It is readily distinguished by the characteristic spectacle mark on its hood. The venom of the Cobra affects the nervous system and death ensues rapidly when a person is bitten by a Cobra. The young of the Cobra are extremely active and bite viciously even as soon as they are hatched. Two specimens of the adult Cobra and a young one are exhibited in this series. A preserved egg of the Cobra accompanies a life-like plaster cast of this snake, with the hood spread out, in the case at the front end of this gallery, captioned "Snakes Harmless and Poisonous". The Cobra frequents the underground nests of the termites or white ants generally, but is found in almost all types of habitats, being equally at home in the jungle, in the open fields or in the vicinity of human habitations. About 10 to 20 eggs are laid at a time, and the male takes a share in guarding the eggs. The Cobra feeds chiefly on rats, mice, toads and frogs, but sometimes also on eggs, birds and other snakes. A pair of Cobras with their eggs laid in a termite's nest are shown in a diorama in the Ecology Section of the General Gallery.

THE HAMADRYAD or KING COBRA (*Naja hannah*).—This is a much larger snake, sometimes attaining a length of more than ten feet. It frequents dense jungle, and in southern India, it is found in hilly districts such as Nilgiris and Travancore. It is diurnal in habit, and its main diet consists of snakes. It is highly aggressive in its disposition and attacks readily when encountered. The eggs which number about 20 to 40 are laid in a nest of leaves and are guarded by the female. Apart from the specimen in the spirit-preserved series, there is a skin of a much larger specimen mounted in a glass frame on the wall.

KRAITS.—Kraits are remarkable for the highly polished character of their scales. One of their chief distinguishing features is the enlarged row of vertebral scales (i.e., the scales on the middle line of the back are enlarged). They are quiet and inoffensive in their disposition, and only under great provocation can they be induced to bite, but they are dangerously poisonous, their venom being four to five times more virulent than that of the Cobra. Kraits inhabit more or less open country, frequenting cultivated areas. Their food consists mainly of snakes.

THE COMMON KRAIT (*Bungarus caeruleus*) (Tamil: *Ennai Viriyan*) is black or bluish black above, with narrow white cross bars, while the Banded Krait (*Bungarus fasciatus*) (Tamil: *Kattu Viriyan*) is characterised by the presence of a prominent ridge down the back and tail, and is alternately banded with black or purplish black and bright yellow or buff, the black bands being as broad

as the interspaces between them. The former is found in many parts of India, including southern India, but the latter is mostly confined to northern India, being recorded only as far south as as Hyderabad in Southern India. Both the species are represented by almost full-grown specimens in the present series. Wax casts, painted in their true colours, are also exhibited in the cases in the centre of the gallery. The cast of the Banded Krait was prepared from a very large specimen, beautifully yellow with broad black cross bands received from the Madras Zoo recently.

CORAL SNAKES.—Coral Snakes are small, only reaching a length of two and half feet or less. They are of a timid disposition and nocturnal in their movements. They are often found half buried in the earth beneath fallen timber or among leaves during the day. Their food consists chiefly of snakes. They are called Coral Snakes on account of their beautiful colouration. Specimens of two species occurring in South India, namely *Callophis bibroni*, a reddish or purplish brown snake with black cross bars recorded from the Western Ghats, and *Callophis melanurus*, the Slender Coral Snake, with the head and neck black and the body light brown, are exhibited.

Family VIPERIDAE.

This family includes the Vipers, which constitute a well known group of poisonous snakes, readily distinguished by the presence of a broad, flat head usually covered with small scales, a narrow neck, a vertically elliptical pupil and a short tail. Vipers are viviparous, bringing forth numerous young ones alive. There are two chief groups of Vipers—the Pit Vipers and the Pitless Vipers. The Pit Vipers have a characteristic pit—the loreal pit—between the eye and the nostril, while in the Pitless Vipers this pit is absent. In all the Vipers the poison fangs are well developed. The channel for the conveyance of the venom in the fang is completely closed, and there is an ingenious mechanism in their skull by which the fangs, which lie horizontally in the mouth when the mouth is closed, are automatically erected when the mouth opens.

PITLESS VIPERS.—The best known species of Pitless Vipers found in India are the Russell's Viper or Daboia and the Phoorisa or the Saw-scaled Viper. The Russell's Viper (*Vipera russelli*) (Tamil: *Kannadi Viriyan*) is a beautiful rufous brown or sandy brown snake with long rows of large, oval, black-edged spots looking like chains. The head bears a V-shaped mark with its apex pointing forwards. The belly is white with small dark spots scattered sparsely. It commonly inhabits the plains and often prefers open country. In captivity it is sluggish and does not readily bite, but when disturbed or irritated, it hisses fiercely and strikes with great force. Its bite is almost always fatal to man. As the venom of the Russell's Viper has a strong local action, killing the tissues near the bitten part, there is intense pain and



FIG. 14 BUNGARUS FASCIATUS: THE BANDED KRAIT.



FIG. 15 DIORAMA SHOWING ADULT RUSSELL'S VIPER WITH YOUNG.

blood continues to ooze out from the seat of the bite for a considerable time, the poison tending to prevent the clotting of the blood. The victim may die in a few hours or after a few days, depending on the amount of poison injected: The Russell's Viper is a prolific breeder, bringing forth about thirty to forty or more young ones in one brood. The young are active and bite more readily than the adults.

THE PHOORSA OR SAW-SCALED VIPER (*Echis carinatus*) (Tamil : *Surutai Pambu*).—This is another common Pitless Viper with broad plates on the belly and small scales on the head. It is a small snake measuring about one and a half to two feet in length, brownish or sandy in colour, often having small, white, diamond-shaped patches along the back. The head is triangular and bears a distinct white mark shaped somewhat like a broad arrow or trident. The scales are keeled, the edges of the keels being characteristically serrated—a feature to which the snake owes its popular name, "Saw-scaled Viper". In disposition it is fierce and vicious, biting on the least provocation. The snake is viviparous producing about three to fifteen young in a brood.

PIT VIPERS.—These are distinguished by the presence of a pit in the loreal region, i.e., between the eye and the nostril on each side. The well known Rattle Snake of America, of which there is one spirit-preserved mounted specimen in this gallery, belongs to this group. The Indian species of Pit Vipers are exclusively confined to hilly regions and are common in the Himalayas, Western Ghats and Nilgiris at elevations of 1,500 to 10,000 feet. Though these species are sometimes fairly large and have well developed fangs, their bite is rarely fatal to man.

THE COMMON GREEN PIT VIPER OF BAMBOO SNAKE (*Trimetopon gramineus*) (Tamil : *Pachai Viriyan*) is perhaps the best known and most widely distributed species of Indian Pit Vipers. It is usually bright green, with a yellow or white stripe on each flank. It prefers to live in bamboos and low vegetation and its colour harmonises so well with its surroundings that it escapes notice except when it moves. It is very common in the Western Ghats, Himalayas and in the Hills of Peninsular India. Its bite is rarely fatal to man. It brings forth its young ones alive.

There are some species of Pit Vipers in which the head is covered with distinct shields instead of small scales. The Hump-nosed Viper, *Axestrodon hypnale* is an example of this group. It is brown or variously mottled and has a longitudinal series of large, dark, oval spots on each side of the back. It has a protuberance on the snout. It is found in the hills of Southern India and Ceylon.

THE RATTLE SNAKE of America (*Crotalus ruber ruber*), a specimen of which, received from the Madras Zoo, is exhibited in this

gallery, is a large, brownish, dangerously poisonous snake, the bite of which is fatal to man. It has a rattle at the tip of its tail, composed of a series of loose horny rings, which when shaken, produce a rattling sound. These rings increase in number with age. The Rattle Snake feeds upon small mammals which they hunt by night. It is sluggish in disposition and does not bite readily except when disturbed. During the cold weather it hibernates underground. The noise of the rattle is very loud in dry weather, but much duller on wet days and is a shrill sound like that of a rattling alarm clock. Rattle Snakes are confined to America.

Family HYDROPHIIDAE.

This family includes the Sea snakes which can be readily distinguished from all others by the flattened shape of their tails. This is an adaptation to their aquatic habitat as the laterally compressed oar-shaped tail enables them to swim with ease. The cross-section of their tail is therefore elliptical instead of being circular as in other snakes. Their nostrils are located on the top of their snout—another adaptation for life in water. Their eyes are reduced, and their head shields are more or less regular.

Sea snakes are all highly poisonous their venom being about ten times more virulent than that of the Cobra, but fortunately most of them are sluggish and seldom bite. The back is usually dull olivaceous green or bluish grey, conspicuously banded with black, greenish or bluish stripes which may be broad or thin. The belly is white or yellowish. Sea snakes frequent the coastal waters and often find their way into tidal rivers. They feed almost entirely on fish, and are frequently caught in fishermen's nets. Most of the Sea Snakes are viviparous.

The following species are common around the Madras Coast and are represented by large, well preserved specimens in this gallery :—

THE JEW'S NOSED OR BOIE'S SEA SNAKE (*Enhydrina schistosa*) (Tamil: *Valakadyen*).—This is by far the commonest Sea Snake found around our shores, and occurs in large numbers. The colouration is variable. The young are bluish or bluish grey, with many well defined black ring-like bands, but as they grow older, these bands become more and more obscured, disappearing ventrally to become dorsal bars which in old specimens may disappear altogether. Old adults are of a uniform bluish or bluish grey colour. These snakes are frequently brought up in large numbers in fishermen's nets and are thrown back into the sea by the fishermen. They are gentle in disposition and seldom bite.

LINNE'E SEA SNAKE (*Pelamis platurus*).—This is perhaps the most widely distributed species among the Indian Sea Snakes. The colour is extremely variable, but the most common and widely distributed form is the typical 'bicolor', in which the head



Fig. 16 UPPER SIDE OF THE HEAD OF A VIPER.

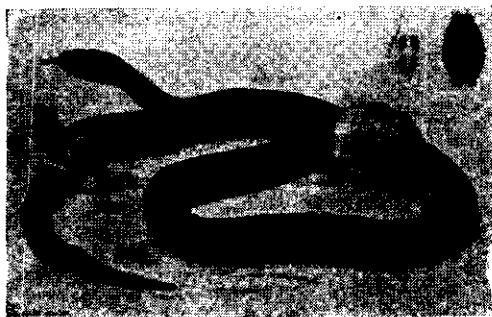


FIG. 17 *ECHIS CARINATA*: THE SAW-SCALED VIPER.

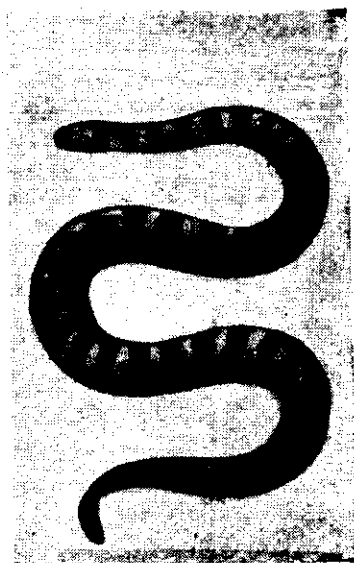


FIG. 18 *ENHYDRINA SCHISTOSA* THE JEW'S NOSED SEA SNAKE.

and body are chocolate brown or black above and the belly yellow or light brownish, the two colours being sharply defined. The tail bears black dorsal bars and lateral spots.

THE NARROW-BANDED SEA SNAKE (*Hydrophis spiralis*) (Tamil: *Kadal nagam*).—This is the largest of our Sea Snakes growing almost to eight or nine feet in length. It is yellowish or yellowish green with more or less complete narrow, black, ring-like bands, much narrower than their interspaces. The head in the young is blackish with a yellow horse-shoe shaped mark above, but in the adult it is usually entirely yellow. It is a strong and active swimmer, ascending up rivers to a considerable distance. Several large specimens of this species have been recorded from the Mahabalipuram Coast, South of Madras.

THE COLLECTION OF SNAKES IN THE MADRAS GOVERNMENT MUSEUM.

The Museum possesses a fairly rich collection of snakes, mostly belonging to South Indian species. About 72 species are represented in the entire collection. Of these, nearly 60 species are represented in the gallery collection. The total number of specimens of snakes in the entire collection is about 258, of which about 96 are exhibited in the galleries, and the remaining 162, which are mostly duplicates unsuitable for display purposes, are stored in the reserve collection. Specimens in the reserve collection are always available for study and examination by students and research workers, on request.

