MADRAS GOVERNMENT MUSEUM

GUIDE TO

THE LIZARDS, CROCODILES, TURTLES AND TORTOISES EXHIBITED IN THE REPTILE GALLERY

By

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Superintendent, Government Museum, Madras

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PREFACE

The Government Museum, Chennai, had started acquiring zoological specimens from 1856 onwards. In the reptile gallery, the visitor will be impressed by the huge specimens of Indian marine turtles, crocodiles and South Indian species of lizards. 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 activities, 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 scholars and prove to be useful to them.

Chennai - 8.
11.02.1999

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

GUIDE TO THE LIZARDS, CROCODILES, TURTLES AND TORTOISES EXHIBITED IN THE REPTILE GALLERY OF THE MADRAS GOVERNMENT MUSEUM

The Reptile Gallery of the Madras Government Museum occupies a narrow, rectangular hall adjoining the large General Gallery in which the skeleton of the Whale and other comparative skeletal structures are exhibited.

The living members of the Class Reptilia are grouped under the following major subdivisions according to the current system of classification. Their corresponding equivalents in the older system, followed by the popular names of the groups, are mentioned within brackets against each of them :—

1. **Order Squamata—**
   Suborder Sauria (=Lacertilia, the lizards).
   Suborder Serpentes (=Ophidia, the snakes).
2. **Order Loricata (=Crocodilia, the crocodiles and their allies).**
3. **Order Testudines (=Chelonia, the tortoises, turtles and terrapins).**
   Suborder Athecae (including only the Leathery Turtle)
   Suborder Thecophora (including all other species of turtles and tortoises).

Of these, the suborder Serpentes (formerly referred to as Ophidia) comprising the snakes has already been dealt with by me in a separate Guide issued earlier (*Guide to the Snakes exhibited in the Reptile Gallery of the Madras Government Museum*, 1960). The present Guide is therefore devoted to the remaining three groups, namely, the Lizards, Crocodiles and the Tortoises and Turtles.

Order SQUAMATA.

Suborder SAURIA.

The suborder Sauria, as already mentioned above, includes the great group of reptiles commonly known as the Lizards. Lizards vary a great deal in their size, structure and mode of life. The vast majority of lizards have relatively short bodies and four limbs, but there is considerable variation in the degree of development of the limbs. In some species like the skinks, the limbs are reduced, and a few species are altogether limbless. Most lizards have

movable eye-lids and some indication of an external ear. Unlike snakes, lizards have the two halves of the lower jaw united firmly in front. This condition prevents lizards from swallowing large objects as snakes do. Lizards feed mostly on insects, spiders and other small invertebrate animals, but a few species, especially among foreign forms, exhibit decided herbivorous tendencies, as for instance, the marine Iguana of the Galapagoes, which subsists mostly on seaweeds. All species of lizards, except the American Gila Monster and the Mexican Beaded Lizard, are non-poisonous. Many species of lizards exhibit interesting differences between the sexes and striking instances of courtship display. Most lizards lay eggs, but a few species are viviparous.

The exhibited series of lizards in the Reptile Gallery of the Madras Government Museum consists of a few dry-preserved stuffed specimens, including an interesting habitat group of the Garden Lizard or Blood-sucker, and a fairly complete systematic series of wet-preserved specimens belonging to South Indian species mounted in jars and arranged in their proper classificatory order in a long, narrow wall case and adjoining cases. The exhibited species are briefly described below in their systematic order, grouped under their respective families.

The sub-section of the Reptile Gallery devoted to the Lizards actually commences with a small, but realistic habitat group of the Garden Lizard or Blood-sucker (*Calotes versicolor*), but as this belongs to the family Agamidae, which is placed after the Geckonidae in the systematic sequence, it is more convenient to describe it below in its proper systematic position when dealing with the lizards of the family Agamidae.

This habitat group is followed by a series of spirit-preserved as well as one or two dry-mounted specimens of South Indian lizards, classified and arranged under the various families, commencing with the family Geckonidae.

Family GECKONIDAE.

This family includes some of our commonest lizards, as for instance, the common wall or house lizard. The skin is soft, with granules or tubercles on the upper parts and imbricate scales beneath. The eyes are usually covered with a transparent membrane and are devoid of movable eye-lids. The tail is fragile, but capable of regeneration. Except a few forms, all the lizards of this family have adhesive expansions on their digits, by means of which they are able to run up vertical walls and other smooth surfaces. Geckoes are found almost every where. They are found in open country as well as in wooded regions and many species are found in and around human dwellings. They feed chiefly on

insects. Most of them are nocturnal, but many species are active also during the day. With a very few exceptions, Geckoes are oviparous. They are inoffensive creatures and display a marked ability to live in close proximity to man. Many species are easily tamed and make attractive pets. Geckoes almost always lay two eggs at a time. The eggs are round with a white shell, and are frequently attached to a vertical surface. All Geckoes cast their skins at regular intervals. The moulted skin is often swallowed by the lizard.

Several species of *Hemidactylus* are exhibited in this gallery. *Hemidactylus triedrus* is one of the common species of House Geckoes found almost all over India and Ceylon. Both the adult and young of this species are exhibited. During life, this species is buff-coloured in the upper side with a greenish tinge and with scattered white tubercles. Three pale olive-green cross bars are present on the back, each edged with white. The lower side is pinkish white. The young are light brown in colour, with regular dark brown cross bars, bordered with white.

These lizards are found in houses as well as in the jungle and open country up to an altitude of 4,000 feet. They have also been found in association with termitaria, where termites constitute their main item of food.

Hemidactylus subtriedrus is a closely allied species, found chiefly among rocks. They seldom enter houses. They are mostly confined to the Nellore and Ellore districts of Andhra Pradesh.

Hemidactylus reticulatus is a much smaller lizard found under stones on rocky ground in Mysore State and in the Shevroy and Palkonda Hills. It is brown above, with a network of darker lines and with many of the tubercles whitish. The under surface is whitish.

Hemidactylus frenatus is a common House Gecko in Southern India, Ceylon and Southern Indo-China. It is greyish or pinkish brown, and may sometimes be quite dark brown above. There may be indistinct darker markings arranged in the form of longitudinal stripes. The markings are more distinct in the young. The tail is sometimes coral-red during life. The body bears small granules intermixed with rounded or conical tubercles which vary in number.

Hemidactylus brooki (Fig. 1) is the commonest House Gecko found in India, but it is also frequently found away from human dwellings. There is considerable variation in the size and proportions of the head and snout and in the nature of the tubercles on the back. It is light brown or greyish above, with dark brown

Fig. 1 HEMIDACTYLUS BROOK. THE COMMON HOUSE GECKO.

spots usually more or less regularly arranged in the form of broken transverse bands. The sides of the head bear a dark streak. The tail is thick at the base, depressed and bears a series of keeled tubercles.

Hemidactylus giganteus and Hemidactylus maculatus are the largest of the Indian species of *Hemidactylus*.

Hemidactylus giganteus is greyish above, with large undulating cross bars. Its head is large, with the snout bluntly pointed. It is a species found on trees, and its distribution is restricted to the Godavary Valley, Malabar, Hyderabad and Palkonda Hills.

Hemidactylus maculatus is brown above, with dark brown spots, which are often connected to form undulating cross bars on the back. The head is rather large, with a somewhat bluntly pointed snout. The young ones bear very distinct, dark brown, wavy cross bars. This is one of the largest of South Indian Geckoes.

Hemidactylus leschenaulti is a moderate-sized Gecko, grey above, with dark brown, wavy cross bars or rhomboidal markings along the middle of the back. The tail is strongly depressed and swollen at the base. The head is rather large, with a broad and obtuse snout. This species is said to be abundant all over Ramanathapuram district in South India, but it is seldom found in houses. It is often seen perched on the trunk of a tamarind tree with the greyish brown bark of which the colour of the lizard harmonises admirably. In Ceylon it is common in the drier parts.

Dravidogecko anamallensis (formerly named *Hoplodactylus anamallensis*) is a moderately small lizard found in the hills of South India, Anamalais, Pulneys and Tirunelveli Hills. It is greyish above, spotted or marbled with darker grey. The head is depressed and the snout obtusely pointed. The tail is cylindrical and swollen at the base. This is a rather rare species, and only a few specimens are known.

Calodactylodes aureus is another moderate-sized Geckonid lizard with a large head covered above with granular scales and larger rounded tubercles. The ends of the digits are rather strongly expanded. This lizard is of a brilliant golden colour during life, freckled with brown on the upper surface. But the colour unfortunately fades into brownish white in preserved specimens. It is found among rocks in dark, shady ravines. The type specimens were collected from Tirupattur in the Tirupathi Hills. Formerly this genus was known as *Calodactylus*, which is a synonym for *Calodactylodes*.

Gymnodactylus nebulosus.—This is a moderately small lizard with the back covered with small granular scales and larger keeled tubercles. The digits are not expanded, but are provided with

claws. It is light brown or greyish above, with dark brown paired black-edged markings along the back. This species has been recorded from Godavary and the Golconda Hills.

Several species of *Cnemaspis* (formerly better known as *Gonatodes*, which is a synonym *for Cnemaspis*) are represented in the exhibited series of lizards in this gallery. Most of the known Indian species of *Cnemaspis* are confined to the hilly regions of Southern India and Ceylon. The digits are slender and provided with claws, and the pupil is rounded. The body is somewhat flattened and the tail more or less cylindrical. These lizards are supposed to be diurnal, but most species appear to hide under stones and logs of wood during the day, and begin to move about only at dusk. These are mostly small, or moderate-sized lizards.

Cnemaspis indicus inhabits the Nilgiris and hills of Travancore. It is brown above, with lighter and darker markings. During life, it is said to be mottled brownish or greenish brown, with a row of orange-yellow spots along the back.

Cnemaspis wynaadensis occurs in Wynaad and the hill ranges, south of Wynaad, in wet forested regions up to an altitude of about 3,000 feet. During the day, this lizard remains concealed under stones. It is brown above, marbled with lighter and darker markings.

Cnemaspis mysoriensis inhabits the hills of Southern India up to an altitude of about 3,000 feet. It is brown above, often with a longitudinal median band and dark brown spots along the back.

Cnemaspis kandiana is common in the hills of Ceylon and Southern India. It is particularly common in the vicinity of Kandy in Ceylon where it is found in houses as well as in forest. It is also found in the Andaman Islands. It is brown above, marked with lighter and darker transversely arranged spots.

Cnemaspis gracilis.—This is treated by some as a sub-species or variety of *C. kandiana*, which it resembles very closely. It has only been doubtfully separated as a distinct species from *kandiana*. It is greyish brown above, with lighter and darker brown markings and is found in forests in the hills of Ceylon and South-western India.

Family AGAMIDAE.

This family includes some of the most familiar species of lizards such as the Garden Lizard and its allies. It is also unique in that it includes the only lizards that are capable of at least a gliding type of flight—the flying dragon or the flying lizard. Many of these lizards have ornamental appendages such as crests, neck

pouches, etc., and during the breeding season many of them, especially the males, assume brilliant colours, and most species exhibit remarkable courtship displays. The teeth are also peculiar among the lizards in that they are usually differentiated into incisors, canines and molars, a feature which these lizards share with the Chameleons. The eyes bear rounded pupils and are protected by fully developed eyelids. The tail is long, but does not break readily as in the Geckonidae. Many of the Agamids are capable of changing their colour to match their surroundings with astonishing rapidity. Most of them are insectivorous, but one or two species appear to be herbivorous. Almost all species of Agamidae are oviparous.

The genus *Draco* which includes the flying lizards or flying dragons, is represented in the exhibited series of lizards by a single species, *Draco dussumieri* (Fig. 2). These lizards are entirely arboreal and are characterised by the presence of a large, lateral wing-like expansion of the body supported by about six or seven ribs which are specially elongated. This wing-like membrane is kept folded along the sides of the body when the creature is at rest or when it clambers about through the branches of trees in search of insects, but it is expanded when the lizard glides or parachutes from tree to tree. A pouch (known as the gular pouch is present on the lower side of the neck; this pouch is much larger in the males. They feed upon insects, grubs, etc. The eggs are buried in the ground. *Draco dussumieri* is greyish brown above with darker markings and its wing membranes are purplish black during life with light, rounded spots. The throat is dark blue with black spots. This species is often found in cocoanut and batelnut plantations in Trivandrum, Cochin, Coorg, Malabar and other localities in South India.

Sitana ponticeriana is a common Agamid lizard in many districts, especially the drier ones, throughout India. The body is somewhat laterally compressed and covered with regular keeled overlapping scales. There is no crest along the back as in the common Garden Lizard. The male bears a large neck pouch extending backwards along the belly. The limbs are long and adapted for rapid progression on the ground. It can run very swiftly, and is able to dart away and hide in some crevice or other at the least sign of approaching danger. It is said to be common throughout Ramanathapuram. When excited it unfolds the folds of its neck pouch and folds again alternately with such rapidity as to produce an effect similar to the flicker of sparkling light. This pouch assumes brilliant colouration during the breeding season. Both male and female specimens are exhibited, the male specimen showing the gular pouch clearly.

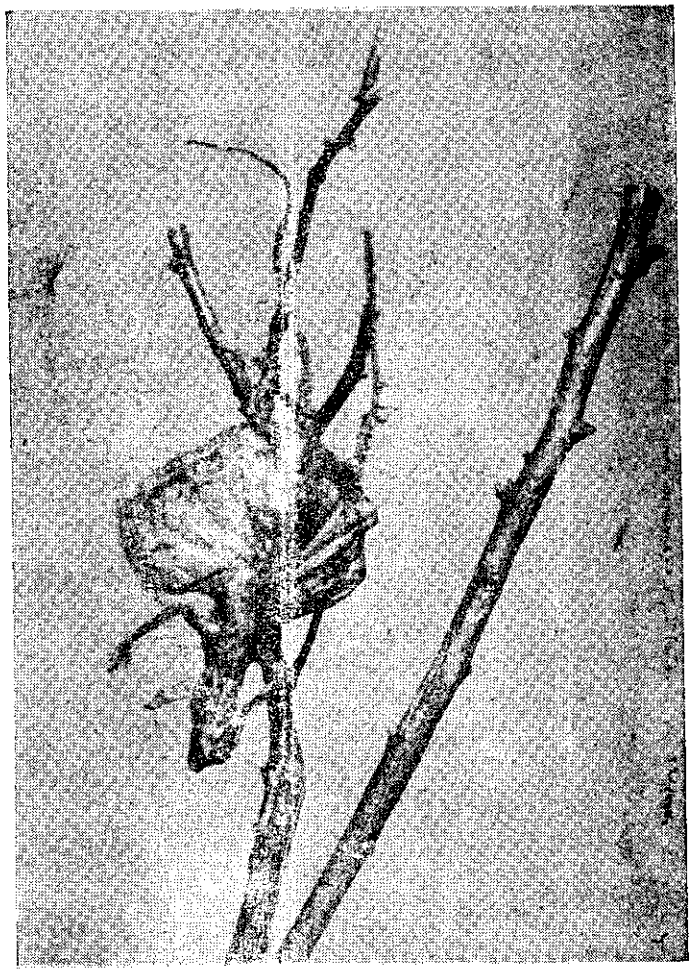

Fig. 2 DRACO DUSSUMIERI: THE FLYING DRAGON OR FLYING LIZARD.

The genus *Salea*, which is confined to South India, includes two species, *S. horsfieldi* and *S. anamallayana*, and both these are exhibited. In this genus, the body is compressed and covered by large overlapping scales of unequal size along the back. The tail is strongly compressed and bears a crest above in the male.

Salea horsfieldi is very common in the Nilgiri and Pulney Hills and is often found in bushes, hedges, orchards and gardens. The male assumes a brilliant verdant green colour on the back and bright yellow on the head during life, especially when excited. A young specimen of this species is exhibited. This lizard is green in life with reddish or dark brown markings, but fades to a yellowish brown in spirit.

Salea anamallayana occurs in the hills of Southern India such as the Anamalai and Pulney Hills up to an altitude of 7,000 feet. The back is marked with four broad, triangular or V-shaped dark brown marks.

In the genus *Calotes* which includes the common Garden Lizard or so-called Blood-Sucker, *Calotes versicolor*, the body is compressed and the dorsal scales are regular and overlapping, and a more or less well developed median crest is present along the back. The tail is long and slender, but in the adult male, it is usually swollen and rounded at the base, where the scales are also enlarged.

The common Garden Lizard, *Calotes versicolor*, is represented in this gallery not only by a well mounted spirit-preserved specimen in the regular systematic series, but also by a small but realistic habitat group illustrating particularly its breeding habits (Fig. 3). Its popular name, " Blood-sucker " is somewhat misleading, for it never sucks blood although the brilliant red colour of the head and throat assumed by the male during the breeding season makes one believe that it georges itself with a throat-full of sucked blood.

This is a common lizard found in gardens and open jungle. It frequents bushes and hedges, feeding mostly on insects, spiders, worms, etc. During the breeding season, the male assumes a brilliant crimson or scarlet colour over its head, neck and shoulders; sometimes this colour extends over a greater part of the body also. A pair of the Garden Lizard [male and female (Fig.4)], are also exhibited in the General Gallery in the section devoted to the use of colouration in animals, with the breeding colours emphasized in the male, specially to illustrate this remarkable phenomenon of courtship colouration. During the breeding season, the males are very pugnacious and change colour frequently as they fight. The breeding season commences early in May and ends in September. The eggs are usually laid during the summer

Fig. 3 CALOTES VERSICOLOR: THE COMMON GARDEN LIZARD (HABITAT GROUP ILLUSTRATING BREEDING HABITS: NOTE EGGS BURIED IN THE EARTH, EXPOSED IN THE FOREGROUND).

Fig. 4 CALOTES VERSICOLOR: THE COMMON GARDEN LIZARD (SHOWING MALE, BELOW, AND FEMALE ABOVE, DURING COURTSHIP).

and are deposited in soft earth a few inches below the surface. A few eggs thus buried in the ground are seen in the vertical section of the earth exposed in the foreground of the habitat group (**Fig. 3**). Ordinarily about four to twelve eggs are deposited at a time.

Apart from the common Garden Lizard, specimens of three other species of *Calotes* are exhibited, namely, *C. nemericola*, *C. gradisquamis* and *C. ellioti*. Of these, *C. nemericola* and *C. grandisquamis* are closely related to the common Garden Lizard, and are remarkable for their very large dorsal scales.

Calotes nemericola (Fig. 5) occurs on the Nilgiri Hills and is green or brownish above, with indistinct darker scales.

Calotes grandisquamis is more or less of the same size as *C. nemericola* which it resembles very closely. It occurs on the Anamalai, Bramagherry and Travancore Hills and is green above, during life, sometimes with broad, black cross-bars.

Calotes ellioti is a much smaller lizard about half the size of the two preceding species. It occurs on the hills of South India (Anamalais and Tirunelveli Hills up to an altitude of 6,000 feet. The back is olive-coloured, marked with angular dark brown cross-bars and an angular black mark on either side of the neck.

The habits of all these species of *Calotes* are more or less similar and resemble those of the common Garden Lizard in several respects. They are both terrestrial and arboreal in their habits, and are capable of remarkable changes in colour during life, especially in the breeding season.

The genus commonly known as *Charąsia* has recently been renamed as *Psammophilus*. This genus includes only two Indian species and both are represented in the exhibited series. In this genus the body is depressed and covered with uniform keeled scales and there is no regular median crest along the back, nor is there any gular pouch on the neck. The tail is long and slender.

Psammophilus dorsalis occurs on the hills of South India at considerably high elevations. It has been recorded from Malabar, Mysore, Nilgiris, South Arcot and Nallamalai Hills. This species is very common in some regions of the Nilgiris where it occurs up to an altitude of 6,000 feet. It frequents bare rocks with which its dull pale brownish colour matches very well. It is very active, and at the same time extremely wary, taking shelter in some nook or crevice at the slightest sign of danger. The male assumes brilliant colours during the breeding season. The young (of which one specimen is exhibited) are olive-brown spotted or marbled with dark brown, with a series of white elongate spots along each side of the neck.

Fig. 5 CALOTES NEMERICOLA.

Psammophilus blanfordiana is closely allied to the preceding species which it resembles in many respects. It may, however, be distinguished from *Psammophilus dorsalis* by the scale count round the middle of the body being much less and the dorsal scales being always distinctly keeled and overlapping. This species is more widely distributed and occurs in Bihar, Orissa, Madhya Pradesh, as well as on the hills of Madras, Salem district and Travancore as far south as Trivandrum. This species is also normally found only on rocks, but it is said to enter human dwellings occasionally. The male assumes a brilliant red colour around the head and neck in the breeding season, and exhibits a characteristic courtship display. The young are olive-brown above, spotted with brown and usually with a series of rhombus-shaped, dark brown, pale-centred spots along the back.

Family CHAMAELEONIDAE.

This family includes the peculiar lizards known as the Chameleons. In many characters, the Chameleons are unique and stand apart from other lizards. The hands and feet are adapted for clasping stems and branches and unlike other lizards, the Chameleons are slow and deliberate in their movements. But this is compensated for by the extraordinary development of its tongue which it can shoot out with lightning rapidity. Their remarkable ability to change colour rapidly to match the surroundings is almost proverbial, but apart from the colour of the surroundings, other factors such as temperature and emotional state also appear to influence the nature of the colour changes. The tail is long and prehensile; it is often kept rolled downwards and helps in effectively grasping the branches among which the Chameleon moves. The eyes are large and covered all over by a thick, granular lid, with a small transverse silt in the middle for the pupil. The eyes of the Chameleon are remarkable in that they can be moved around independently of each other. This provides the creature with an exceptionally large range of vision. The skin is covered with flattened tubercles or granules instead of scales. The tongue is another unique feature of the Chameleon. It is cylindrical and elastic and capable of being extended enormously. The tip of the tongue is slightly enlarged and club-shaped and is coated with a sticky secretion. The tongue can be extended to nearly a foot in adult Chameleons. It can be shot out with astonishing rapidity and the prey, which readily adheres to the sticky extremity of the tongue, is drawn in almost instantaneously. This wonderful adaptation for capturing its prey makes up for the slow and deliberate movements of the otherwise sluggish creature. Chameleons are voracious in their feeding habits, feeding mostly on insects and their larvae. They thrive in captivity if they are properly fed and cared for.

Fig. 6 CHAMAELEON ZEYLANICUS : THE CHAMELEON.

The only Indian species, *Chamaeleon zeylanicus*, is represented in the exhibited series by a dissected female specimen showing the eggs *in situ*, a dry-preserved mounted specimen painted in its natural colours (Fig. 6), a mounted skeleton and another spirit-preserved entire specimen (though badly faded), with its tongue fully extended and displayed to show its enormous length and its sticky, dilated extremity. The usual prevailing colour of this species in life is green, varying in shade from very pale green to almost black. When excited, the body becomes marbled or mottled with various bands and blotches of yellow, blue or black. This species is oviparous, and lays about thirty eggs which are buried in the ground about a foot below the surface. It is widely distributed, occurring all over the wooded districts of Peninsular India and Ceylon.

Family SCINCIDAE.

This family includes the Skinks which are perhaps the least familiar among the lizards. They are generally secretive in their habits, and often extremely shy and retiring. They are distinguished by the presence of smooth, glossy, often brightly coloured skin which is protected by osteoderms (i.e., hard scales impregnated with bony material). Some of them possess remarkably striking colour patterns. The limbs may be present or absent, but in many species in which they are present they show a distinct tendency to be reduced to varying degrees. Abdominal ribs are sometimes present especially in burrowing forms, in which the eyes are reduced. In some skinks the lower eyelid develops a transparent "window" which may grow larger in some species, covering the entire eye and uniting with the small upper eyelid to form a single immobile, transparent lid. Most of the skinks are terrestrial and extremely active in their movements, but a few show a tendency towards an arboreal habitat although they do not possess any special adaptations for such a habitat. Some species are oviparous, while others are viviparous.

Of the numerous genera of Scincidae represented in the Indian Region, only three, *Mabuya, Lygosoma and Ristella* are represented in the exhibited series of lizards in this gallery.

The genus *Mabuya* includes perhaps our best known species of skinks. The commonest among them is *Mabuya carinata* (Tamil: Aranai) (Fig. 7), which is the usual form met with around human dwellings. It is brown, or olive or bronze-coloured above, either uniform or with dark brown or black spots or longitudinal streaks along the lateral margins of the scales. A pale dorso-lateral longitudinal line extends from above the eye to the base of the tail. A second white line extending from the upper lip along the side of the flank is sometimes present. In the breeding season the flanks of the male are scarlet and the belly yellow. It is oviparous and

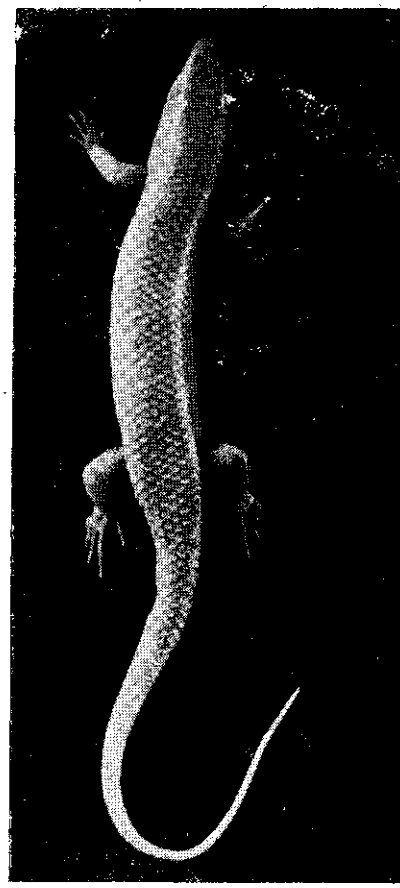

Fig. 7 MABUYA CARINATA : THE COMMON SKINK.

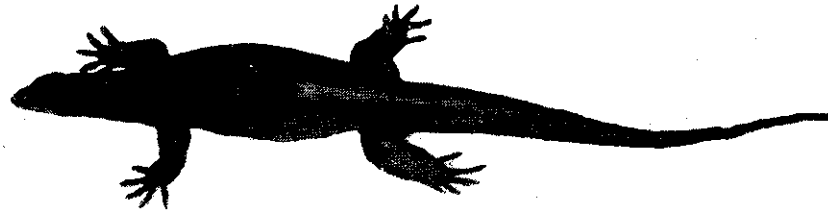

Fig. 8 VARANUS MONITOR THE COMMON INDIAN MONITOR.

lays about twenty eggs. The popular belief that the bite of this skink is fatal to man is of course a fallacious idea, for the only known poisonous lizards are the American Gila Monster and the Mexican Beaded Lizard.

Mabuya bibroni is a much smaller species of skink found mostly along the sea coast. It is said to be extremely abundant along with the Agamid lizard *Sitana ponticeriana* on the sands of Ramanathapuram District along the coast. It burrows under low vegetation on the sand dunes near the sea. It is olive brown above, with a light vertebral stripe, margined broadly with black. There is also a black dorso-lateral stripe edged with white extending from the eye to the base of the tail. Its distribution appears to be confined to the eastern coast of the Indian Peninsula. It has also been recorded from Rameswaram and Ceylon.

Mabuya trivittata (formerly better known by its synonymous name, *Mabuya vertebralis*) is another moderately small skink, greyish brown above, with five broad, longtitudinal, black-edged yellow stripes (which fade into white in preserved specimens). This species is widely distributed, being found in Bombay, Hyderabad, Bihar, Calcutta and Madras.

Mabuya macularia is a smaller species of skink widely distributed all over India and extending even to Burma, Cambodia and Malay Peninsula. But the colour and pattern of colouration is very variable and several geographical forms differing strikingly in colour may be distinguished. The specimen exhibited is the Southern form which is dark bronze-coloured above in life, with a light dorso-lateral stripe and sometimes with a series of small black spots along the back.

Other species of skinks exhibited in this gallery belong to various other genera, namely, *Lygosoma, Leiolopisma, Riopa and Ristella.*

Lygosoma maculatus is a moderate-sized skink occurring in the Eastern Himalayas and Assam, Siam and Southern Burma. It is bronzy brown above, sometimes with small, obscure light spots which are golden green in life, and two median series of small black spots.

Lygosoma dussumieri is an allied species, pale olive or bronzy green above, in life, with a light dorso-lateral streak and a broad dark brown lateral stripe edged below with white. It is recorded from South-western India from South Kanara to Trivandrum and also from Ceylon. It is said to be one of the commonest species of skinks found in the plains of Travancore both in forested regions and in open country. During life the tail is bright red in the male and brownish in the female.

Leiolopisma bilineatum (formerly referred to as *Lygosoma bilineatum*) is a species of skink found in the Nilgiri Hills in South India. It is brown or bronze-coloured above with a blackish stripe along the side of the head and the body. In the young, the tail is of a beautiful violet colour. The eyelids are well developed, the lower eyelid bearing a more or less transparent disc.

Riopa punctata (formerly better known as *Lygosoma punctatum*) is another widely distributed species of skink found usually in hilly country at low elevations. It is brown above, and each scale is marked with a dark basal spot—these spots coalescing in the young to form distinct stripes. The tail is reddish in the young. This species has been recorded from a wide range of localities including the Nilgiris, Shevroys, Anamalais, Coimbatore and Madurai.

The exhibited series of Scincidae also includes two species of the genus *Ristella*—a group of comparatively small lizards confined to the hills of Southern India. In this genus the lower eyelid is scaly, the ear opening distinct, and the limbs, though small, are well developed, the hand bearing four and the foot five digits. The claws are completely retractile into a large, narrow sheath composed of a single specially modified scale. Only four species are recorded, and specimens of two of these, *Ristella rurki* and *R. beddomii*, are exhibited.

Ristella rurki is reddish brown above, the scales bearing small black spots which sometimes coalesce to form distinct stripes. This species is common throughout the wetter forests of the Western Ghats generally between 2,000 and 5,000 feet, and has been recorded at these elevations in the Anamalai and Pulney Hills.

Ristella beddomii is a closely allied species with the flanks bearing yellow spots and often with a large black blotch above the forelimb. It has been recorded from Cochin, Travancore and North Kanara.

Family LACERTIDAE.

This family is confined to Europe, Asia and Africa and is particularly well represented in Africa, but comparatively few species are known in the Indian Region. The tongue is deeply notched in front. The limbs are fully developed and the top of the head is covered with symmetrical shields. The lower eyelid in many species bears a large transparent disc through which the eye is clearly visible.

The specimens exhibited belong to two genera, *Carbita* and *Ophisops*. In *Carbita* the lower eyelid is distinct from the upper while in *Ophisops* it is fused with the upper eyelid.

Two species of *Carbita* are known and both these are represented in the exhibited series.

Carbita leschenaulti is found all over the Indian Peninsula and in Ceylon, especially on the hills. It is brownish or golden-coloured above during life with a pale stripe edged above with black extending along the side of the body and the tail. It is active in its habits and is usually found in wooded locality in open country.

Carbita jerdoni is very similar to the preceeding species, but more northierly in its distribution, being found in Northern and Central India as far south as the Godavari District. It is also brownish or golden-coloured above, but bears two pale lateral stripes, the upper being more well marked than the lower. These stripes are bordered with a series of black spots. It is said to be quite common in the drier forests of the Godavari District.

Ophisops jerdoni is the only species of *Ophisops* represented among the exhibited lizards in this gallery. The lower eyelid bears a very large transparent disc and is completely united with the upper eyelid which is reduced or absent altogether. The head shields are strongly keeled and grooved. This lizard is olive-brown or golden brown above, in life, with two bright golden-coloured streaks. This species is widely distributed, being recorded from several localities in Northern, Central and Southern India. The exhibited specimen is from Nallamalais in South India.

Family VARANIDAE.

This family includes the largest known lizards—the Monitors and their allies. Although the Indian species attain only a moderate size, there are gigantic species, such as the giant Komodo Dragon, *Varanus komodoensis* (of which a photograph is exhibited in the case containing the Monitor lizard), living in the Komodo Island, and which is the largest of living lizards, reaching a length of ten feet. Monitors are found in all types of country ranging from deserts to tropical forests. Some species, such as the Common Indian Monitor and especially the Water Monitor, are partial to water and its vicinity and may even be said to be amphibious in habits.

The body is robustly built, with a long powerful tail. The tongue is smooth, very long, bifid in front and retractile into a sheath at its base as in snakes. The eyelids are well developed.

The single extant genus of this family, *Varanus*, includes about half dozen species recorded from India, but of these only the commonest species, the Common Indian Monitor, *Varanus monitor* is represented in the exhibited series in this gallery by an adult mounted specimen (Fig 8), a young specimen, an egg and a fully articulated skeleton.

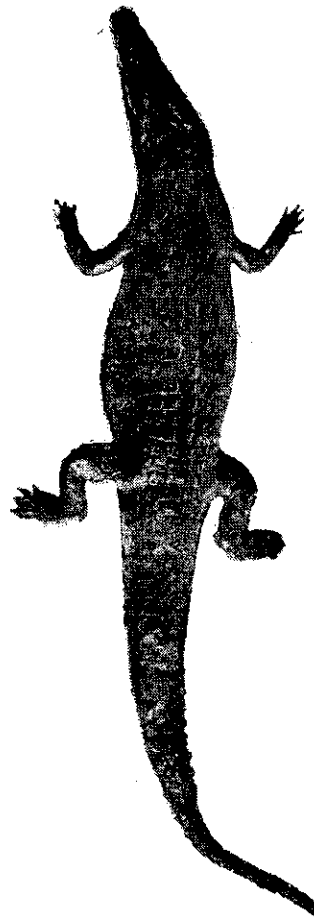

Fig. 9 CROCODILUS POROSUS : THE ESTUARINE CROCODILE.

Varanus monitor is widely distributed in India and occurs throughout India and Ceylon and a greater part of Burma. Like other species of *Varanus*, it is carnivorous and feeds on any kind of animal food which it can capture and overcome. Its diet is varied and includes birds, eggs of birds, small mammals, reptiles, fish, crabs and even large insects. Sometimes it is also known to feed on carrion. It can run at a great speed and when it does so it keeps the tail lifted up at an angle from the ground It can climb trees very well and when chased, it readily disappears in the hollow of a tree. When angered or cornered, it becomes ferocious and bites hard, hissing loudly and lashing its tail vigorously. It enters water readily and is able to swim well. Its colouration harmonizes well with its surroundings. Sometimes it shams death by lying motionless upon the ground or on the trunk of a tree. Its tail and claws are very strongly developed and the powerful grip with which it can take hold of vertical surfaces is well known. Its flesh is supposed to have restorative properties and hence used in making medicinal preparations. Its eggs are also eaten.

About twenty-five to thirty eggs are laid in a hole or ant hill. The young are dark olive, with numerous light spots arranged in transverse rows and alternating with dark spots or bars. The young are sometimes called *bis-cobra* and are believed to be poisonous, although, in fact, they have no poison.

Order LORICATA.

(=CROCODILIA.)

This order includes the Crocodiles, Alligators, Gharials and their allies. They are perhaps the bulkist of all living reptiles. They are elongate, four-limbed reptiles with a powerful tail. The body is covered with thick scales or scutes (osteoderms) which are underlaid with bony plates, those on the back being keeled and raised to form definite longitudinal ridges and those on the belly being squarish and smooth. In between the scales the skin is soft. The snout varies a great deal in shape. In the crocodiles it is more or less elongately triangular and pointed, but in the Gharial it is extremely elongated and narrow, with a spatulate end. The eyes, nostrils and external ears are all situated on the upper side of the head, so that breathing and the senses of sight and hearing are not affected when the animal is under water, keeping the upper part of the head alone raised above the water. Another adaptation to aquatic life is the presence of movable valves in the nostrils and ears; these valves are kept closed when the animal is under water thus preventing the entry of water. The teeth are embedded in sockets unlike in all other living reptiles. The fore-limbs bear five digits and the hind limbs only four. This is illustrated in this gallery by an exhibit consisting of a mounted hand

and a foot of the crocodile showing the differing number of digits The powerful tail serves not only for swimming but also as an organ of offence and defence.

Crocodiles are fierce, voracious creatures and are essentially carnivorous animals feeding on mammals and birds, especially water birds. They are also known to attack and devour human beings, and there are records of human ornaments having been found in the stomachs of crocodiles. The Gharials, however, feed almost exclusively on fish. Crocodiles have a keen sense of sight and hearing.

All crocodiles are oviparous, laying large, hard-shelled oval eggs which are often deposited in well constructed nests. The young are provided with a large, sharp egg-tooth at the tip of its snout; the egg-tooth helps the young one to break through the egg shell at the time of hatching. The voice of crocodiles normally resembles a loud bark, but they can also produce a loud hissing sound when angered or irritated.

The exhibits of Crocodilia displayed in this gallery are mostly confined to the wall space in one section of the gallery on the side opposite to the exhibited specimens of Turtles and Tortoises. The exhibited material of Crocodilia includes its eggs and developing embryo, young specimens (Fig. 11) in various stages of growth, one adult specimen of each of the two known Indian species, *Crocodilus porosus* (Fig. 9) and *Crocodilus palustris* (Fig. 10), a mounted head of the Gharial with its enormously elongated snout (Fig. 14), a massive skull of a much larger specimen of *Crocodilus palustris* (Fig 13), mounted specimens of the fore and hind limbs of the crocodile showing the presence of five digits in the fore limb and four in the hind one, a fully articulated specimen of the entire skeleton of an adult crocodile, (Fig. 12) and various named disarticulated skeletal parts of the crocodile, including sections of its skull illustrating crocodilian osteology which may be of special interest to students. The material pertaining to Crocodilia in this gallery is therefore quite representative and instructive.

One question that is often asked by the lay visitor when going round this gallery is " What is the difference between the crocodile and the alligator? ". This reveals the confusion that generally prevails among laymen about crocodiles and alligators. Alligators are found only in China and North America; they possess a much broader and blunter snout and the fourth tooth of the lower jaw slips into a shallow pit of the upper jaw, while crocodiles are found in Asia, Africa, Malay Archipelago, the tropical Australian Region as well as in tropical America, possess relatively narrower, longer and more pointed snouts and the fourth tooth of the lower jaw fits into a definite groove of the upper jaw.

Fig. 10 CROCODILUS PALUSTRIS: THE MUGGER OR MARSH CROCODILE.

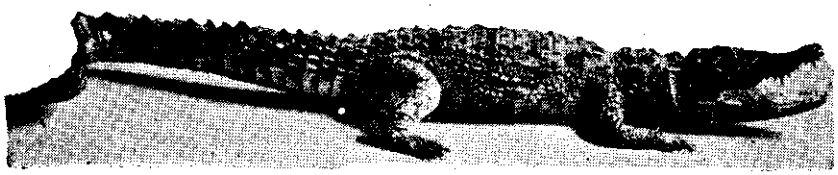

Fig. 11 CROCODILUS PALUSTRIS: THE MUGGER OR MARSH CROCODILE (YOUNG, CLOSE-UP).

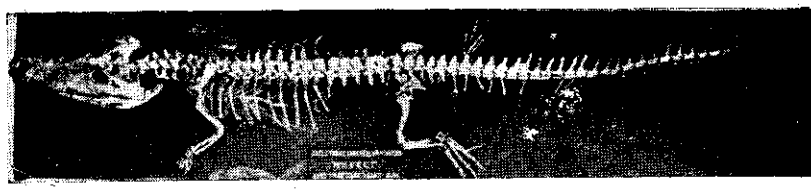

Fig. 12 SKELETON OF CROCODILUS POROSUS

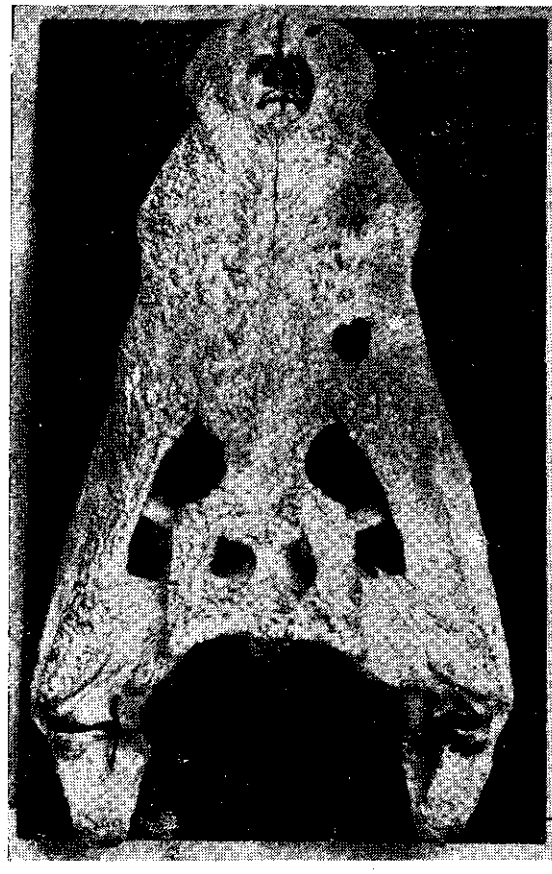

Fig. 13 SKULL OF CROCODILUS PALUSTRIS.

The Gavial (or Gharial), *Gavialis gangeticus*, as already mentioned, is represented among the crocodilian exhibits in this gallery by a mounted head bearing the enormously long, narrow snout with about 27 to 29 pairs of teeth in the upper jaw and about 26 pairs in the lower jaw. The snout is dilated into a spatulate expansion at its tip, and is eminently adapted for catching fish on which the Gavial mainly feeds. Sometimes, however, it is known to feed on birds and even small mammals such as dogs and goats. The Gharials are the oldest of the living Crocodilia, and the present species is the only living species known. It inhabits the mouths of large rivers such as the Indus, Ganges, Mahanadi, Brahmaputra and other rivers in Northern India, and its distribution extends even to Upper Burma.

Two species of *Crocodilus* (the Crocodile), namely, *Crocodilus porosus* and *Crocodilus palustris*, are known in India, and both these are represented by well mounted entire dry-preserved exhibits in this gallery.

Crocodilus porosus (separated by Deraniyagala into a distinct genus, *Oopholis*) is the Estuarine Crocodile which inhabits the mouths of large rivers and canals. They are particularly plentiful in the deltas of great rivers. This is the largest of living reptiles and attains an enormous length of thirty-three feet. The huge size and tremendous strength of this Crocodile enable it to seize and overcome even large and powerful animals, including human beings. It feeds also on fish, birds and even turtles. The female makes a kind of crude nest with reeds and dead leaves and the eggs are incubated by the heat produced by the fermenting vegetation coupled with the warmth of the sun's rays. This species is confined, in India, to the east coast of India and the southern extremity of the west coast as far north as Cochin, but it also occurs in Ceylon, the Malay Archipelago, the coasts of Indo-China and the northern coast of Australia. It is largely hunted as its hide is considered more valuable than that of the marsh or swamp crocodile on account of its smaller scales.

Crocodilus palustris, popularly known as the Mugger of Marsh Crocodile, is the common freshwater crocodile of India. It is found in marshes, swamps, muddy rivers, canals and tanks, and is able to bury itself in mud and tide over adverse conditions when the water dries up. It feeds chiefly on fish and birds, and does not normally prove dangerous to man. It attains a much smaller size than the Estuarine Crocodile, and rarely exceeds a length of about twelve feet. It lays about twenty eggs in a hollow excavated on sand banks of the rivers and swamps in which it lives. Its distribution ranges over the whole of India and Ceylon, and even extends to Nepal and Baluchistan in the North. This species is represented among the exhibits in this gallery by a farely full grown adult mounted specimen, as well as by a

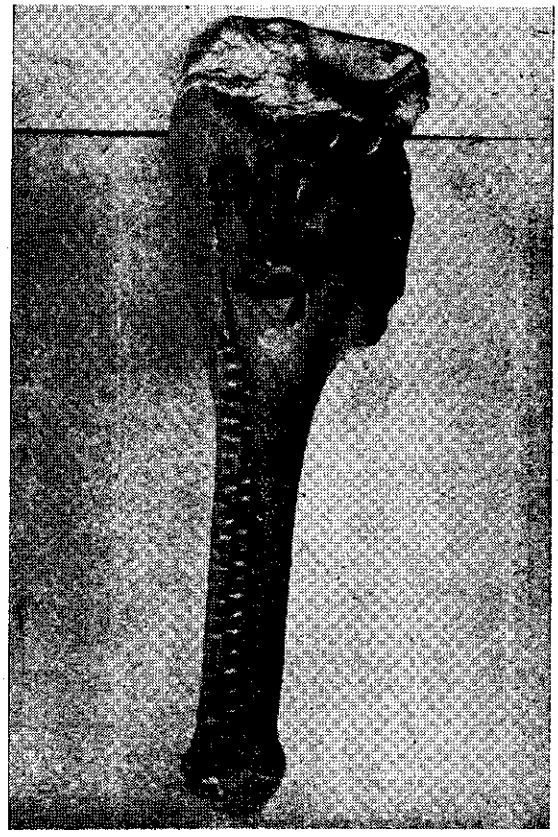

Fig. 14 HEAD AND SNOUT OF GAVIALIS GANGETICUS, THE GHARIAL.

number of young specimens in various stages of growth. The Ceylon form of the Swamp Crocodile has been separated by Deraniyagala as a distinct race, *Crocodilus palustris kimbula.*

The embryonic development of the crocodile is also well illustrated in this gallery by a series of specimens mounted in a large glass jar, consisting of the egg showing the coiled embryo and membrane *in situ*, the embryo coiled up inside the egg and the embryo uncoiled to show the yolk sac. In addition to these, a dry-preserved egg of the crocodile is also exhibited.

Order TESTUDINES.

This order includes the great group of living reptiles known as the Chelonians, comprising the Tortoises, Turtles and Terrapins. This group of reptiles is very clearly distinguished from all other groups by a number of characteristic features, the most important of which is the possession of a box-like shell composed of bony plates. These bony plates are covered (except in the Athecae including the Leathery Turtle, and the Trionychoidea, comprising the fresh-water turtles in which the skin is soft), by horny plates which form what is popularly known as the " tortoise-shell." The dorsal, dome-like portion of this armour-like shell is known as the carapace, and the ventral, flattened, plate-like shell is called the plastron. Several specimens of the bony and horny elements of the carapace and plastron are exhibited in this gallery, the larger ones on the wall, mounted on suitable shields, and the smaller ones inside show cases. Except in the Leathery Turtle, the ribs and vertebrae are immovably fused with the bony carapace on its inner side. The animal can more or less completely retract itself within this shell which forms one of the most effective protective structures known in the animal kingdom. A tail is always present, but differs in length in different species. The jaws are toothless and covered with horny cutting sheaths which may be serrated to form a series of false teeth. The sense of sight is keenly developed, but their sense of hearing is very poor.

All tortoises and turtles are oviparous, laying mostly hard-shelled eggs which may be oval, round or elliptical. In marine turtles, however, the eggs are always spherical and the egg shells imperfectly calcified, being in the form of a tough, parchment-like covering.

The food of tortoises and turtles is most varied. Land tortoises are almost always herbivorous, while aquatic forms may be either carnivorous or herbivorous. Only a few species take a mixed diet, and some even feed on carrion. The carnivorous forms feed on invertebrates such as earthworms, snails slugs, thin-shelled bivalve molluscs, crabs, insects and insect larvae. Young or larval fishes, frogs and toads are eaten by the larger species.

Tortoises and turtles are perhaps the longst-lived creatures, some of the giant species of the Galapagos Islands attaining an age of even one hundred and fifty years or more.

The layman is often curious to know the exact distinction between tortoises and turtles. This is more or less an arbitrary division mainly based on the type of the habitat. The term "turtle" is usually applied to marine forms with the limbs modified into well developed paddles adapted for swimming. However, the term "freshwater turtle" or "mud turtle" is applied to one group of freshwater forms which belong to the family Trionychidae, but these may be distinguished from "freshwater tortoises" (which are grouped in a different family), by the absence of horny shiedls on the carpace which is simply covered with a smooth skin. The term "tortoise", on the other hand, is generally applied to land tortoises (family Testudinidae), and the second group of freshwater forms referred to above, belonging to the family Emydidae, and even among tortoises, it is possible to distinguish the aquatic forms by the more strongly depressed carapace and the more or less webbed condition of the hands and feet—an adaptation for swimming, while in the land forms, as a rule, the carapace is more strongly convex and dome-shaped, and the hands and feet more or less rounded, with the digits free, and thus adapted for normal terrestrial progression.

The exhibits of tortoises and turtles displayed in this gallery consist of a varied assortment of specimens and include a number of stuffed, dry-mounted specimens, a few wet-preserved specimens mounted in jars of alcohol, some skeletal specimens, dry-preserved eggs, and even specimens of the commercial tortoise-shell and one or two objects to illustrate its economic utility.

The exhibited specimens are briefly described below, grouped under their respective families.

Suborder ATHECAE

Family SPHARGIDAE.

This family includes the Leathery Turtle, *Dermochelys coriacea* (Fig. 15), which is the largest of all living Chelonians, attaining a total length of more than six feet and a weight of nearly 1,000 pounds. This and the other species of marine turtles included in the next family are exhibited in the large central show case in this gallery

The Leathery Turtle differs from all other turtles and tortoises in its vertebrae and ribs being entirely free and not fused with the carapace. Unlike the other species, the body is protected by a shield, composed of small, irregular, mosaic-like bony plates covered by a very thick, tough, leathery integument which in the

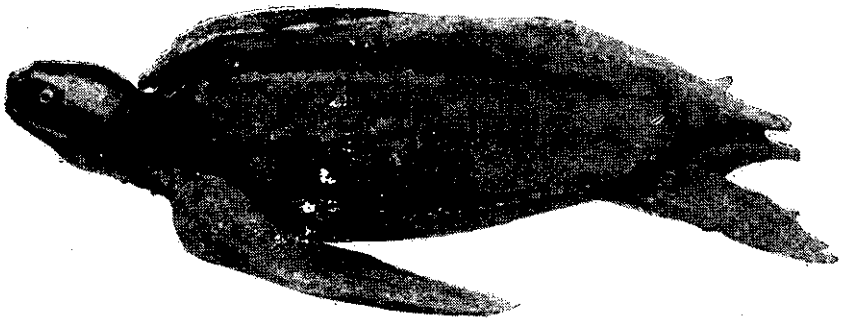

Fig. 15 DERMOCHELYS CORIACEA THE LEATHERY TURTLE

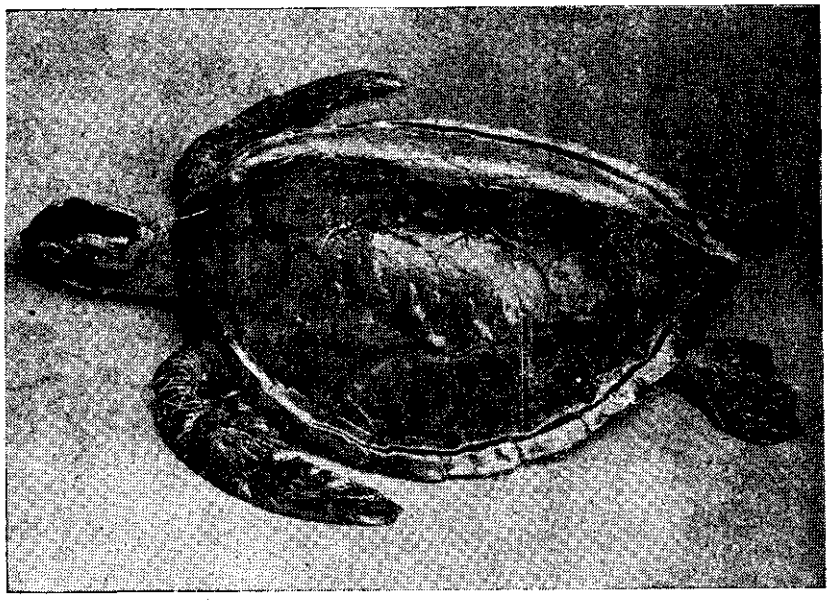

Fig. 16. CHELONE MYDAS: THE GREEN OR EDIBLE TURTLE.

adult is quite smooth except for the presence of a series of strong, longitudinal ridges. In the young, the integument is somewhat tuberculated. The limbs are modified into large, paddle-shaped flippers, devoid of claws, thus enabling the turtle to swim powerfully and often venture far out into the sea. The carapace is dark brown or blackish, often more or less distincly spotted with yellow or splashed and blotched with white or pale yellow. The young are blackish above, with the longitudinal ridges and the edges of the limbs coloured yellowish or white.

On account of its unique skeletal features, some consider the Leathery Turtle to be a primitive form, while others regard it as a highly specialised type, representing an advanced stage in Cheloinan evolution.

The Leathery Turtle is world-wide in its distribution, but it appears to be common only in the tropics and around the coasts of Ceylon, and scarce in othe regions. Its diet is varied and consists of crustaceans, molluscs, small fish and algae. Like all other marine turtles, it comes to the sandy shore to lay its eggs which are deposited in a hole and covered up with sand, to be incubated by the heat of the sun. The young make their way straight to the sea as soon as they are hatched and begin to swim actively.

Suborder THECOPHORA.

Family CHELONIIDAE.

The other three species of marine turtles common around Indian shores are included in the family Cheloniidae. Specimens of these three well known species are also exhibited in the large central show case along with the Leatherly Turtle. In the Cheloniidae the shell of the animal is composed of regular bony plates overlaid with horny plates and the ribs and vertebrae are immovably fused with the bony carapace. All the species are furnished with large paddle-shaped limbs and are perfectly adapted to a marine existence. The three general to which these three species belong are world-wide in distribution and are well represented in tropical and sub-tropical seas.

Chelone mydas is the Green or Edible Turtle (Fig. 16) and is well known on account of the famous " turtle soup " which is prepared out of its flesh. It is called the Green Turtle because of the green colour of its fat. The shell attains a length of about four feet. The Green Turtle feeds almost entirely on small fish and marine algae, but eats molluscs, crustaceans, and worms as well. Like other species of marine turtles it deposits its eggs on the sandy beaches in holes and covers them up with sand. The eggs of this as well as other species of marine turtles are considered to be a delicacy and are extensively collected.

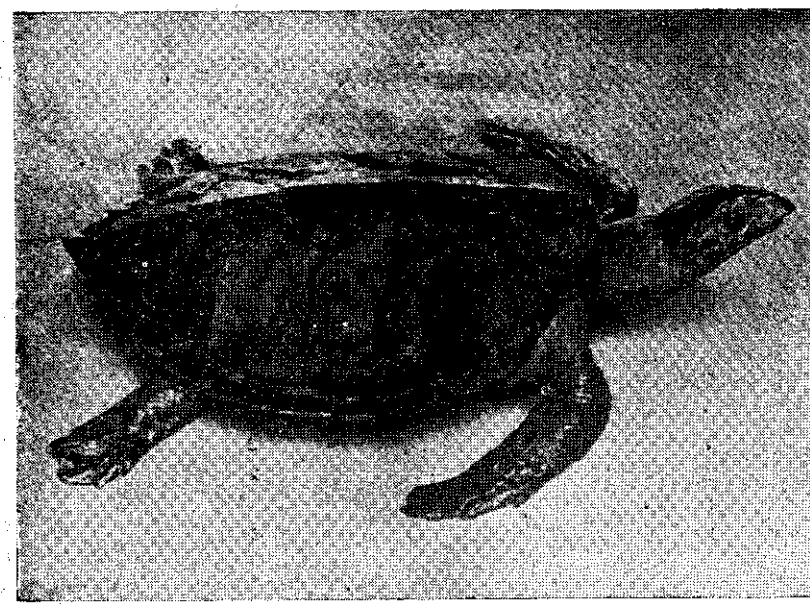

Fig. 17 ERETMOCHELYS IMBRICATA : THE HAWK'S BILL TURTLE.

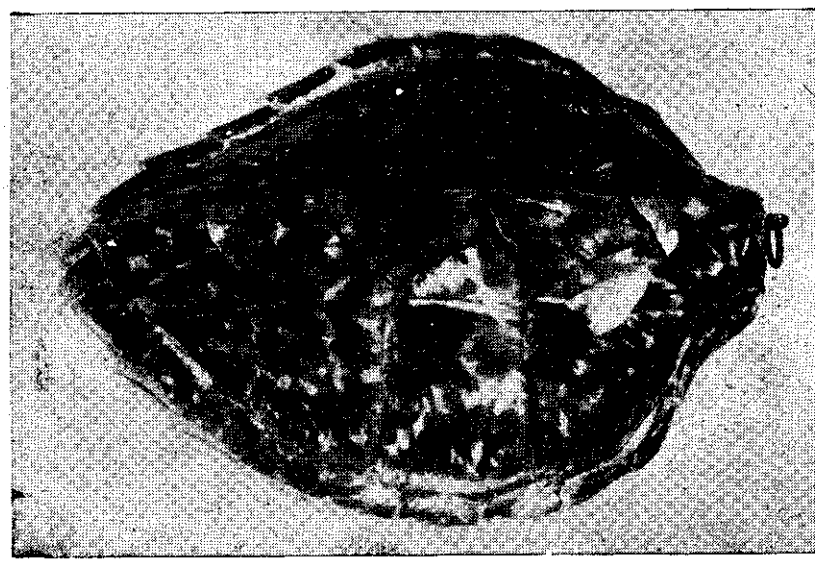

Fig. 18 CARAPACE OF THE HAWK'S BILL TURTLE.

Eretmochelys imbricata is the Hawk's bill Turtle (Fig. 17), which is readily distinguished from the other species of marine turtles by the plates on the carapace being strongly imbricate (i.e., overlapping); in very old individuals they may be juxtaposed. The jaws are peculiarly prolonged and hooked, simulating the hawk's bill—hence its popular name, Hawk's bill Turtle. The carapace of the adult turtles are dark brown, marbled with yellow blotches while the plastron (the ventral shield) is yellow. The young are brown above and blackish below. This species is somewhat smaller than the Green Turtle. It feeds chiefly on molluscs and fishes, but marine weeds are also sometimes eaten. The breeding habits are more or less the same as those of the Green Turtles. The Hawk's bill Turtle is of great economic value on account of its horny shields which yield the valuable "tortoise-shell" of commerce. A specimen of the polished " tortoise-shell" of this species (Fig. 18), and an ornamental comb made out of this are exhibited in an adjoining case containing other skeletal parts of Chelonians. In Ceylon, the horny plates are detached by the cruel method of suspending the living turtles over fire, until the horny plates peel away from the bone of the carapace, after which the creature is returned to the water. In the Philippine Islands, however, the shell is removed only after the turtle has been killed, by immersing the carapace in boiling water until the horny shields loosen.

Caretta caretta (sometimes known by its synonymous name, *Thalassochelys caretta*)is the Loggerhead Turtle (Fig. 19), distinguished by its particularly large head covered with symmetrical shields. There is considerable variation in the number of the shields of the carapace which is strongly convex. The adult is uniformly brown above, and yellowish below, and the young are uniformly dark brown or blackish above, but paler below. The tail is short. The Loggerhead Turtle is more widely distributed than the two preceding species, being found all around the Indian shores and is particularly plentiful around the coast of Ceylon and Andaman Islands. Its food consists chiefly of molluscs and crustaceans, and its breeding habits are more or less the same as those of the preceding species. It is, however, of little commercial value, as its flesh is practically inedible, being far inferior in quality to that of the Green Turtle. This species appears to be more common around the coast of Madras than the Green Turtle. The carapace of the young bears three strong keels but the adult carapace has no trace of these keels. Although the Loggerhead Turtle closely resembles the Green Turtle in general appearance, it may be readily distinguished from the latter by the presence of five or more pairs of costal shields, while in the Green Turtle there are only four pairs of costal shields.

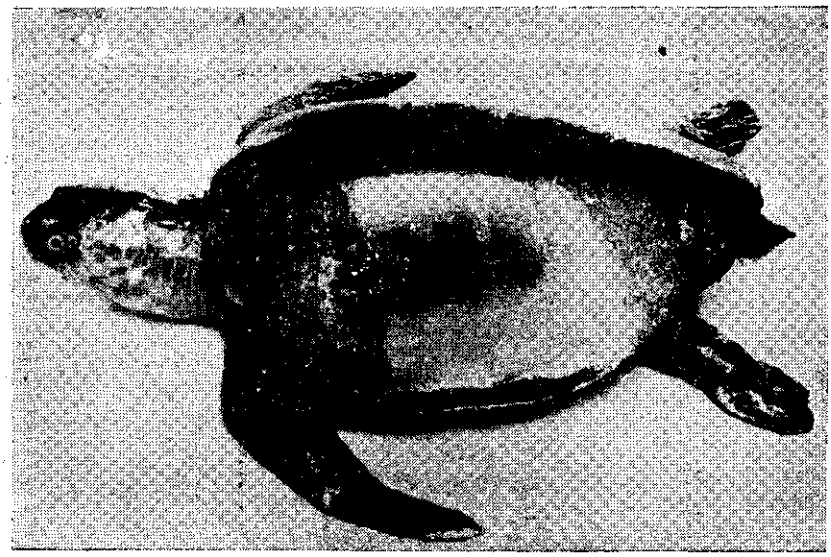

Fig. 19 CARETTA CARETTA : THE LOGGERHEAD TURTLE.

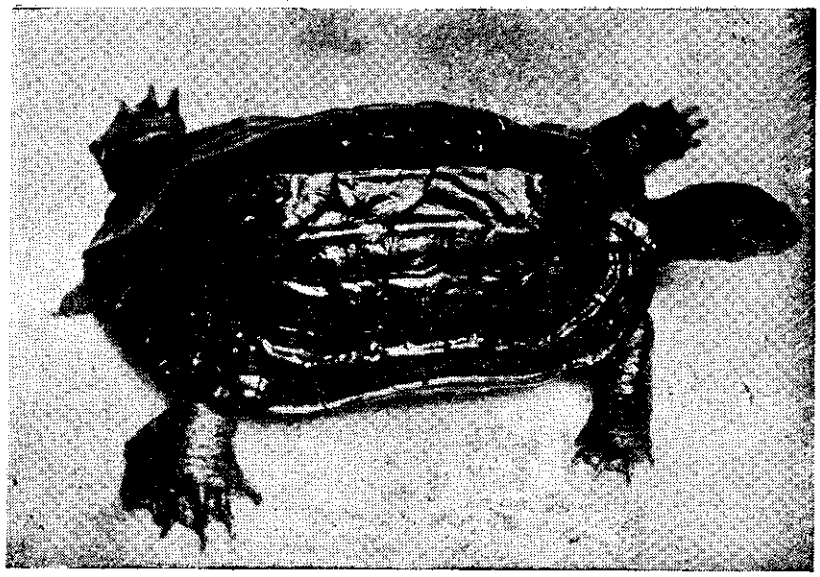

Fig. 20 GEOEMYDA TRIJUGA : THE COMMON POND TORTOISE.

Family EMYDIDAE.

This family includes the freshwater tortoises and terrapins. Although, a large number of genera are included in this family most of them are recorded only from Assam, Burma, Siam, Indo-China, Malay Peninsula and other localities outside India. The head is covered with smooth skin or the covering of its posterior part may be divided into shields. The eggs are oval in shape and elongate. The South Indian forms of this family belong only to two species, namely *Geoemyda trijuga* (of which a number of races have been recorded) and *Geoemyda silvatica*.

A number of specimens of the common Pond Tortoise of India, *Geoemyda trijuga* (typical form) (Fig. 20), and of some of its local races are exhibited in the gallery. Five well defined races of this species (including the typical form) are distinguished, of which only three are South Indian, and all these three races are represented in the exhibited series. All of them are essentially aquatic, though they can lead a terrestrial life, and are herbivorous.

In Geoemyda trijuga (*forma typica*, i.e., the typical form), which is the commonest form of this species, the shell is dark brown or blackish in the adult and light brown in the young. The carapace is moderately depressed with three distinct longitudinal keels and the plastron nearly as long as the carapace, either truncated or broadly indented in front. This typical form of the species is widely distributed all over Bombay, Madras and Mysore States, and it has been recorded even from Malabar on the west coast. This is the common freshwater tortoise of Madras inhabiting tanks and ponds in and around the city.

Geoemyda trijuga var. *coronata* is the race found in Travancore and Cochin. The shell is very dark brown or even black in the adult. The sides of the head are yellowish.

Geoemyda trijuga var. *thermalis* is another race occurring in Ceylon and adjoining regions of the Indian Peninsula, such as Ramanathapuram District. The two mounted specimens exhibited are from Kilakarai in Ramanathapuram District. The shell of the adult is black, while that of the young is dark reddish brown. The head is black, with orange or red spots and a network of markings which are absent in old specimens. They are remarkably varied in their habits. They may be found in ponds or ditches as well as on dry land. They often bask in the sun on stones and logs adjoining the ponds in which they live.

All these races of *Geoemyda trijuga* lay oval, rather elongate white eggs with hard, calcareous shells. They are buried in the earth and are hatched by the heat of the sun.

Geoemyda silvatica is a much rarer species confined to the dense forests of Cochin. The carapace is somewhat strongly depressed and bears prominent vertebral and thin lateral keels. The plastron is large, broadly notched both in front and behind. The shell is dark bronze-coloured above and yellowish below, with two dark blotches on either side. These tortoises are said to live in underground burrows and not necessarily in the vicinity of water. They are entirely harbivorous.

Deraniyagala applies the popular name, Terrapins, to these forms and uses the generic name *Melanochelys* instead of *Geoemyda* in his monograph on the Ceylon Tetrapod Reptiles (Vol. 1, 1939).

Family TESTUDINIDAE.

This family includes the typical land tortoises. The shell is usually more strongly convex above and covered with epidermal shields. The head is also covered with shields above. The limbs are rounded, with the digits free, and adapted for terrestrial life. The eggs are more or less rounded, with well calcified shells. The land tortoises are widely distributed, and by far the largest number of species belong to the genus *Testudo*.

Two species of *Testudo*, namely, *Testudo elegans* and *Testudo travancorica* are represented in South India, and several specimens of both these species are exhibited.

Testudo elegans is popularly known as the Starred Tortoise and is very common in India and Ceylon. It is the common land tortoise found all over Central and Southern India. The shell which reaches a length of eight inches is very high and dome-like. The shell is almost black, with the centres of the dorsal shields forming more or less distinct humps from which yellow lines radiate, giving the shields a star-like appearance from which the animal derives its popular name. There is a great deal of variation in the degree to which the centres of the shields are raised into humps. Their colour and appearance blend so harmoniously with their surroundings that it is not easy to detect and procure specimens of this tortoise. In Ceylon it is found mostly in forests, especially in dry areas. They are most active during the rains. They lay four eggs which are deposited in a hole in the mud which they fill up again with the mud previously scooped up. The eggs are laid immediately after the rainy season.

Besides the specimens exhibited in the case containing the systematic series of land tortoises, a pair of fairly large-sized specimens of the Starred Tortoise are separately displayed in their natural haunts against a painted background in a diorama (Fig. 21), at present put up in the General Gallery. Shells of young specimens of this species are also exhibited in the adjoining case illustrating the skeletal parts of Chelonians.

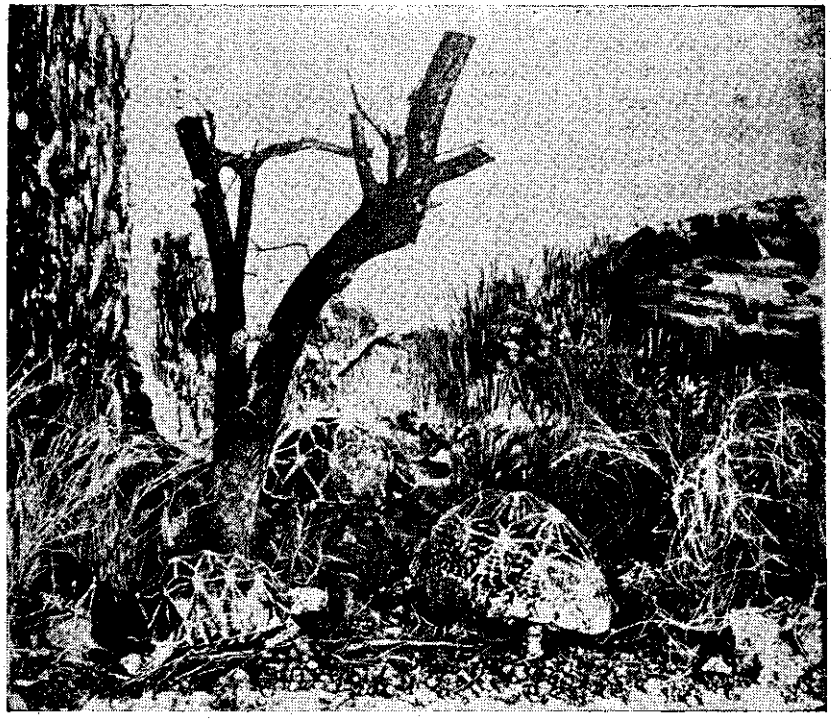

Fig. 21 DIORAMA OF TESTUDO ELEGANS : THE STARRED TORTOISE.

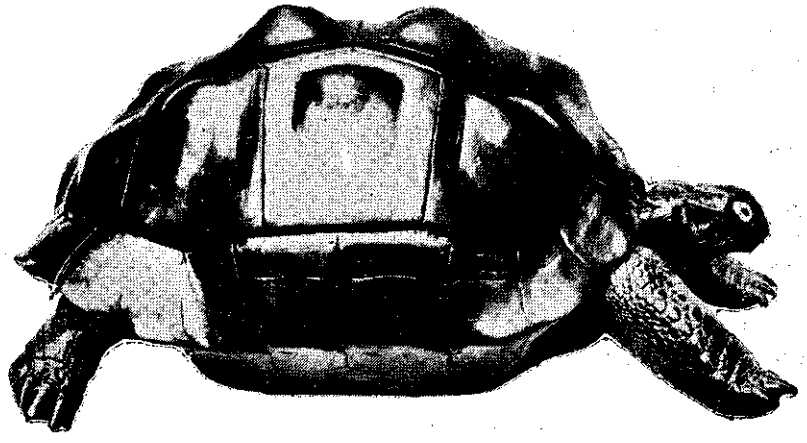

Fig. 22 TESTUDO EMYS : LARGE LAND TORTOISE FROM SEYCHELLES.

Testudo travancorica is another South Indian species of land tortoise which is far more restricted in its distribution. It is chiefly confined to the hills of Travancore where it has been taken below an altitude of 3,000 feet. It has also been recorded from Coorg, Cochin and the Western Ghats. The shell is greenish yellow above and below, and each shield bears an irregular black spot or blotch which may be continuous and extensive, or broken up. The carapace of this species is also displayed separately in the adjoining case illustrating structural elements of Chelonians.

An exceptionally large, glossy black specimen of a land tortoise from Seychelles is also exhibited in this gallery in an adjacent case separately (Fig 22). It has been tentatively identified as *Testudo emys* which is the largest of the Asiatic species of Testudo. The shell is black, very convex and dome-shaped. This species is said to be widely distributed, extending over Burma, Malay Peninsula and Archipelago, but within Indian limits it has been recorded only from Assam. However, it does not appear to have been specifically recorded from Seychelles so far. It inhabits hilly districts and prefers the vicinity of water.

In the adjoining case illustrating skeletal and integumentary structures of the Chelonia, there is a mounted specimen of another large species of *Testudo*, *Testudo radiata*, with a dome-like, highly convex carapace (Fig. 23). The epidermal horny plates have been for the most part removed in this specimen to display the bony part of the carapace. This is an African species, but the specimen is said to have lived for some years in the Museum compound where it had been introduced.

Family TRIONYCHIDAE.

This family includes the freshwater turtles or mud turtles. The carapace of all the members of this family is incomplete peripherally so that the ribs extend beyond the costal plates, sometimes slightly, but sometimes markedly as in *Trionyx*. The plastron (i.e., the ventral plate) is united to the carapace at the sides only by ligamentary tissue and not by a bony bridge as in the preceding families. All the plates of the carapace are pitted, granulated or otherwise sculptured, but in the living creature this is not evident as the carapace is covered by a smooth skin. There are no horny epidermal plates as in the other families (except Sphargidae comprising the Leathery Turtle, which also lacks the horny plates). One of the characteristic features of the skull in the Trionychidae is the presence of three long processes—a median and two laterial ones which project backwards from its rear end.

The freshwater turtles are entirely aquatic in habit. They live mainly in rivers, but some are found also is swamps, tanks and ponds. They are mainly carnivorous, feeding mostly on

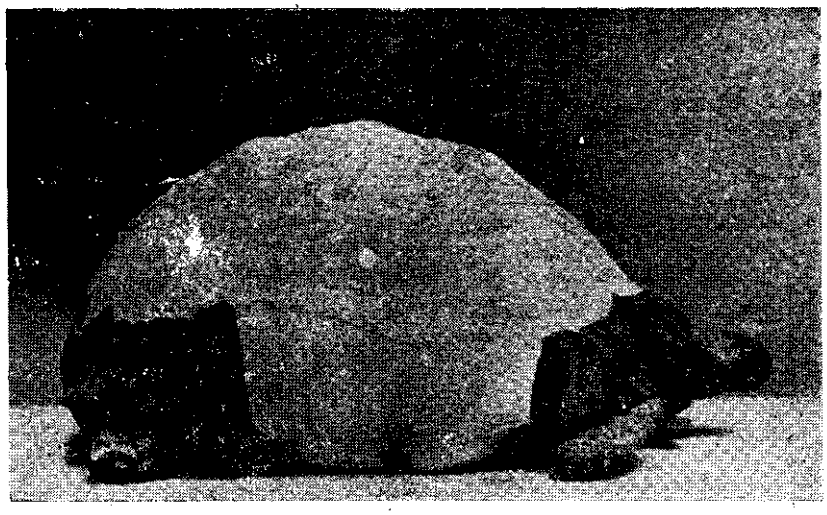

Fig. 23 TESTUDO RADIATA : AFRICAN LAND TORTOISE (WITH THE HORNY PLATES OF THE CARAPACE REMOVED TO SHOW THE BONY PLATES BELOW).

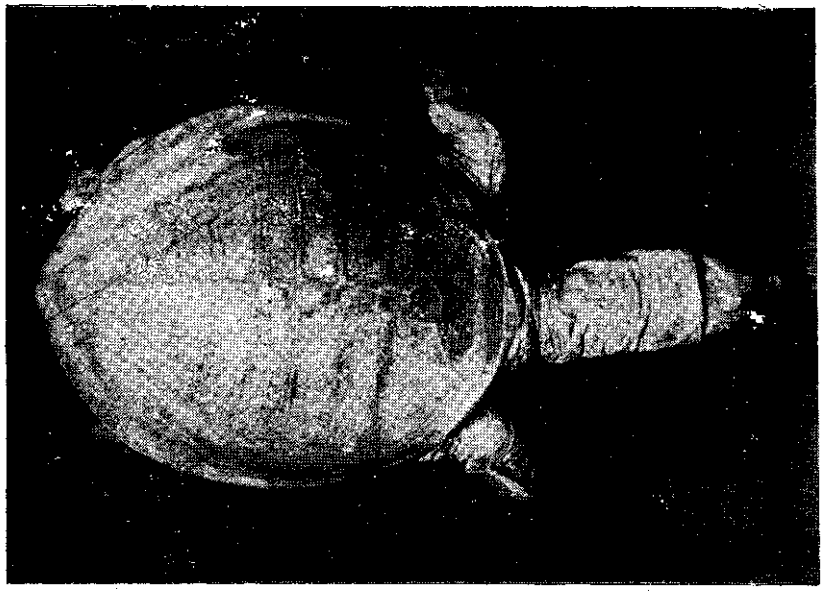

Fig. 24 LISSEMYS PUNCTATA GRANOSA : FRESHWATER TURTLE, OR SOFT TERRAPIN.

fish, frogs, molluscs, etc. In captivity they are omnivorous and will take vegetable food as well. Many species are edible, and large numbers are often captured and sold for food in the markets in Calcutta and other places in the north.

The South Indian species belong to two genera, *Lissemys* and *Trionyx*, and both these are represented by several specimens in the exhibited collection. In addition to these, the carapace of a well known North Indian species, *Chitra indica*, is also exhibited. The genus *Lissemys* has long been known by its more familiar synonymous name, *Emyda*. Hence all the specimens of *Lissemys* in the Museum collection were originally labelled as species of *Emyda*.

Several entire mounted specimens of *Lissemys punctata granosa* (formerly named *Emyda granosa*) (Fig. 24), its carapace, plastron, and sections of its skeleton are displayed in this gallery. The sections of its skeleton are exhibited especially to illustrate the positions of the neck vertebrae when the head is retracted within, and projected outside, the carapace. The position of these skeletal parts is such that it enables the neck to be bent in a sigmoid curve only in one plane, i.e., the vertical plane. There are also a fully disarticulated skeleton of this species illustrating the structure of the skull, the pectoral and the pelvic arches and the skeletal parts of the fore and hind limbs exhibited in the same case.

The typical form of this species, *Lissemys punctata* (*forma typica*) occurs only in Northern India in the Ganges and the Indus and their tributaries.

The present race, *Lissemys punctata granosa* is the more common and widely distributed form occurring all over the Indian Peninsula south of the Ganges, and also in Ceylon. The carapace is uniformly olive brown and closely granulate. The carapace in young individuals may have faint, pale markings. The head is greenish with three oblique, parallel black streaks in the young which may, however, disappear in older specimens. Formerly (when the old nomenclature, *Emyda*, was in vogue), some local varieties were distinguished and given distinct names. One of these is *Emyda granosa intermedia* which extends, in its distribution, over Chota Nagpur, Madhya Pradesh, Orissa and north-eastern parts of the Madras State. Another common variety that was distinguished, was *Emyda granosa vittata*, confined to the Bombay and Madras States. In the former variety the carapace in young individuals has pale obscure markings which are absent in the latter variety. There is also a third form, *ceylonensis* recorded from Ceylon. Specimens of the first two varieties and the eggs of the variety *vittata* are exhibited.

The specimens of the variety *intermedia* are from the lower reaches of the Godavary and from Orissa while those of *vittata* are from Madras. All the three races bear the black head streaks in the young, and Malcolm Smith has combined them all under the single name *Lissemys punctata granosa* in the absence of any well marked distinguishing characters.

This species is popularly known as the Soft Terrapin on account of the soft smooth skin that covers the carapace. The limbs bear three claws and the lips are fleshy. It is essentially carnivorous, feeding on frogs, fishes, crustaceans, freshwater molluscs and earthworms. At nights it comes ashore searching for its food which may also include carrion or decaying animal matter. Its jaws are powerful and well adapted for crushing the hard shells of molluscs and crustaceans. When captured it can inflict severe injury by biting suddenly and pulling away the flesh by retracting its head within its shell. Its eggs are more or less spherical and possess a hard, well calcified white shell. They are buried in holes in marshy soil. The flesh of this species is frequently eaten and is regarded as a good remedy for anaemia. A few eggs of this species are also exhibited along with the mounted specimens.

The carapace of another remarkable species of freshwater turtle, *Chitra indica* is also exhibited, separately in a wall case (Fig. 25). *Chitra indica* is the largest freshwater Chelonian found in India. The carapace is very broad, markedly flattened and rather coarsely pitted. In life, the upper surface of the carapace is dull olive with dark markings or spots in young individuals. The carapace attains a length of nearly one and half feet. The distribution of this species is mentioned as Northern India, particularly the Gangetic Delta, Siam and Malay Peninsula, but it appears to extend to Southern India also, as the present specimen is from the Coleroon river in the Thanjavur district. It is carnivorous and feeds on fish, molluscs and freshwater crustaceans. It can inflict severe wounds by biting suddenly and unexpectedly, shooting out its long neck with amazing rapidity.

About eight species of *Trionyx* are known within Indian limits, but of these, only one, *Trionyx leithi*, extends to South India, and this is the only species of this genus represented among the Chelonian exhibits in this gallery. Two entire mounted specimens of *Trionyx leithi* (Fig. 26), one from Nallamalais and the other from the Thungabadhra river in the Kurnool district, and specimens of its skeleton, including the carapace (Fig. 27), and the plastron (Fig. 28), are exhibited.

In *Trionyx leithi* (Fig 26), the carapace is dark olive green above with lighter irregular markings. In young specimens, the carapace is more greenish and ornamented with four well marked

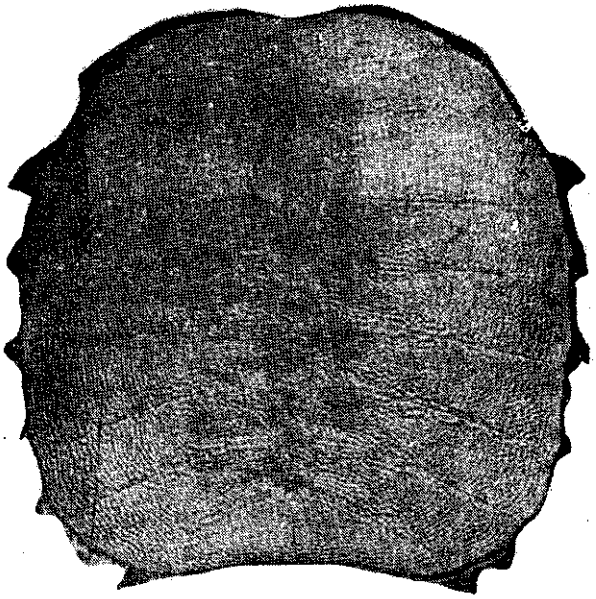

Fig. 25 CARAPACE OF CHITRA INDICA: THE LARGEST FRESH-WATER TURTLE OF INDIA.

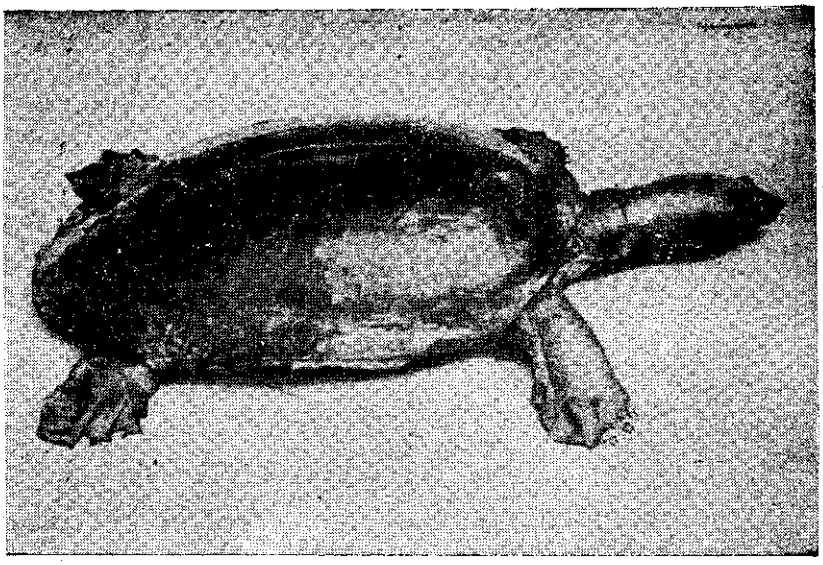

Fig. 26 TRIONYX LEITHI: FRESHWATER TURTLE.

ocelli. The head is greenish, with a few black streaks diverging behind from a median black streak extending backwards from between the eyes. The lower parts are whitish.

This species inhabits the Ganges and the rivers of peninsular India as far south as Madras. Like other species of freshwater turtles, it is carnivorous, feeding on fish, crabs, freshwater molluscs, etc. It is powerful and ferocious in its disposition, and is capable of inflicting severe injuries with its sharp cutting jaws which it is able to shoot out with immense speed. This species is allied to the Gangetic Turtle, *Torinyx gangeticus*, which is the largest Indian species of *Trionyx*.

Although the reptilian specimens in the Museum collection are almost exclusively South Indian, yet occasionally foreign specimens are received and preserved in the collection. In 1955, an exotic specimen was added to the series of turtle exhibits in this gallery. It is *Pseudemys floridana mobiliensis*—the Mobile Turtle of America which lived in the Madras Zoo for some time. The neck in this species is ornamented with conspicuous pale stripes. It is aquatic in habits and is more or less omnivorous.

The Collection of Lizards, Crocodiles, Turtles and Tortoises in the Madras Government Museum.

The Madras Museum possesses a fairly rich and representative collection of these groups of reptiles, the specimens belonging mostly to South Indian species and apart from the exhibited series, there is a well maintained study collection.

Among lizards, about forty-three species are represented in the entire collection. Of these, specimens of nearly forty species are exhibited in the gallery. The total number of specimens of lizards in the entire collection is about 219 (besides eggs, skeletons, etc.), of which about 51 are exhibited in the gallery, and the remaining 168 specimens which are mostly duplicates unsuitable for display, are stored in the reserve collection for reference purposes.

Almost the entire collection of Crocodiles in the Museum is on display in the gallery, the only specimen kept in the reference collection being the skin of a young specimen of the Mugger or Marsh Crocodile. Two species of *Crocodilus* and one of *Gavialis* are represented in the collection, the former by specimens of two adults, three young ones, a skull, skeletons (articulated and disarticulated) mounted fore and hind limbs, eggs and embryonic stages, and the latter by a mounted head alone.

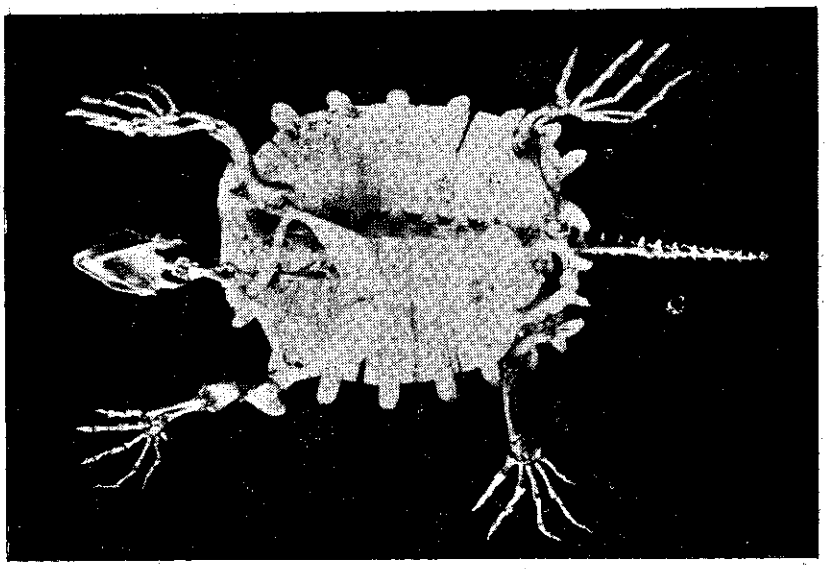

Fig. 27 SKELETON OF TRIONYX LEITHI (WITH THE PLASTRON REMOVED).

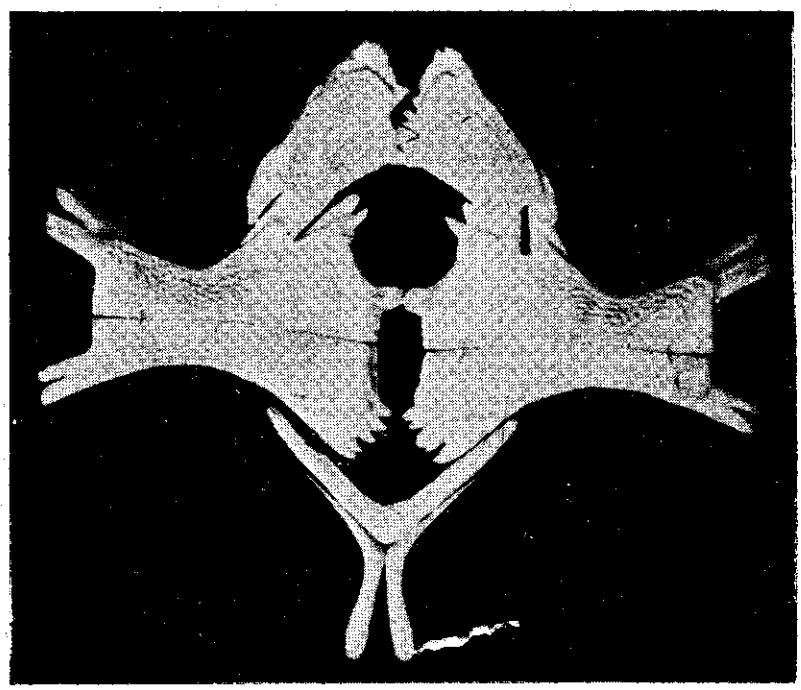

Fig. 28 PLASTRON OF TRIONYX LEITHI.

Among the Testudines (Turtles and Tortoises), although the number of specimens in the collection is fairly large, they belong to only about fifteen species, all of which are represented in the exhibited series in the gallery. Of these, thirteen are South Indian species, while, of the remaining two, one is African and the other American. The total number of specimens of tortoises and turtles in the entire collection is about sixty (including eggs, skeletal parts, etc.). Of these, about fifty are exhibited in the gallery and the remaining ten stored in the reserve collection for study and reference purposes.

Specimens in the reserve collections are always available for study and examination by students and research workers on request.