

MADRAS GOVERNMENT MUSEUM

GUIDE TO THE MAMMAL GALLERY

BY

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PLAN OF THE ZOOLOGICAL GALLERIES (GROUND FLOOR)

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GUIDE TO THE MAMMAL GALLERY

The Mammal Gallery of the Madras Government Museum is accommodated in a large, spacious, more or less square hall on the ground floor of the rear building adjoining the Bird Gallery. Almost all the specimens exhibited in this gallery belong to South Indian species, but the range of distribution of many of these species extends northwards to other parts of India as well. Although the scope of this gallery is primarily restricted to South Indian species, it has been occassionally found necessary to include in this gallery one or two specimens from other parts of India or even from foreign countries, such as, for instance, the Himalayan Cat-Bear, the White-browed Gibbon and the Californian Sea Lion, in order that as many as possible of all the living orders and other major groups of the Mammalia may be represented in this gallery. The material exhibited in this gallery includes mostly entire mounted specimens, but several specimens of skins, horns, skulls and entire articulated skeletons are also displayed. It is hoped that the present Guide will incidentally serve as an introduction to the Mammalian fauna of South India.

Mammals constitute a large and important class of vertebrate animals distinguished, as a rule, by the presence of hair on the skin, and by the presence of mammary glands in the female. They suckle their young ones after birth with the milk secreted by the mammary glands. Among other characteristic features which distinguish the mammals from all other animals are the presence of a muscular wall-the diaphragm-separating the cavity of the chest from that of the abdomen, the presence of a four-chambered heart and a single large blood vessel-the aorta-through which the blood is pumped to various parts of the body and the presence of a single bone in the lower jaw articulated directly with the skull. Like birds, mammals are warm-blooded animals being able to maintain their body temperature at an uniform level higher than that of their surroundings. The teeth are usually differentiated into ingisors, canines, premolars and molars in most mammals, and are of great classificatory value in distinguishing the various orders and genera of mammals.

CLASSIFICATION.

The Class Mammalia is divided into three subclasses, two of which, namely, the Monotremata, or egg-laying mammals of Australia and the Marsupialia or the pouched mammals of Australia and America, include more primitive forms, and are not represented in India. The third subclass, Eutheria (sometimes known as Monodelphia) includes by far the great majority of mammals, and is divided into a number of easily distinguishable orders, of which the following are represented by exhibited specimens in the Mammal Gallery. There are also the only orders of mammals represented in South India, except the Pinnipedia which is totally foreign and includes the Seals, Sea Lions and Walruses.

1	PHOLIDOTA	••	(Pangolins or scaly ant-eaters).
2	SIRENIA	••	(Dugongs or sea cows).
3	СЕТАСЕА	••	(Whales, porpoises and dol-
4	PROBOSCIDIA	••	(Elephants).
5	ARTIODACTYLA	••	(Even-toed hoofed herbivorous animals, e.g., deer, bisons, bui faloes, goats, antelopes, etc.).
6	CARNIVORA VERA (FISSIPEDIA).	• •	(Carnivorous animals, e.g., Lions, tigers, leopards, cats, civets, mongooses, hyaenas, wolves, dogs, otters, badgers, martens, bears, etc.
7	PINNIPEDIA	••	(Aquatic carnivores, including the seals, sea lions, and wal- ruses.
8	RODENTIA	••	(Gnawing animals, e.g., squirrels, rats, mice, porcupines, etc.).
9	LAGOMORPHA	••	(Rabbits and hares.)
10	INSECTIVORA	• •	(Insectivorous animals, e.g., shrews, tree-shrews, hedge- hogs, etc.).
11	CHIROPTERA	• •	(Flying foxes, bats, etc.).
12	PRIMATES	••	(Man, apes, monkeys and lemurs).

The various species of manimals exhibited in this gallery are briefly described below, grouped under their respective orders and families, and arranged in the systematic order.

ORDER PHOLIDOTA.

This order includes the Scaly ant-eaters or Pangolins of Asia and Africa. Formerly, all the ant-eaters, sloths and armadilloes were included in the Order Edentata, but it has now been established that the Scaly ant-eaters of Asia and Africa are not related to the ant-eaters of South America, which, with the sloths and armadilloes constitute the true Edentata. The Asiatic and African Pangolins have now been separated into a distinct order. the Pholidota.

Family MANIDAE.

Teeth are entirely absent and the body and tail are covered with large, overlapping horny plates. The tail is long and the tongue round and extensile. The ears are small and inconspicuous.



FIG. 1-MANIS CRASSICAUDATA: THE SCALY ANT EATER.

This family is represented in South India by a single species. the Indian Pangolin or the Scaly ant-eater (Manis crassicaudata; Tamil: Nalangu or Erumbu-thinni), (Fig. 1). The broad, platelike scales which cover the body are interspersed with a few hairs. The head is small, with a narrow and pointed snout, and the tongue is long, extensile and worm-like. The Pangolin usually lives in burrows which it excavates for itself by means of its somewhat blunted, curved, sickle-like claws. It feeds on ants and termites. When attacked, the Pangolin rolls itself up into an armoured ball in self defence, and it then displays an extraordinary muscular power which defies all attempts to unroll the animal. It is as a rule nocturnal, hiding in crevices of rocks or in burrows underground during the day. This species is found all over India, south of the Himalayas. It seldom thrives in captivity, and is therefore not usually reared in zoos. Two specimens, one in the extended attitude, and the other in the rolled up position, and an articulated skeleton are exhibited.

ORDER SIRENIA.

This order includes aquatic herbivorous mammals known as the Dugongs or Sea Cows. They are distinguished by their fish-like appearance and possess a horizontal tail fin. The front limbs are modified into a pair of paddle-shaped flippers. Hind limbs are absent. Two pectoral mammae are present. The nostrils open in the upper lip between the eyes and the snout. They possess only incisors and molars with flat, grinding crowns. A number of species of this order have become extinct and only a very few species still survive. The living forms belong to the single family Manatidae.

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Guide to the Mammal Gallery

Family MANATIDAE.

FIG. 2-HALICORE DUGONG : THE DUGONG OR SEA COW.

dugong (Fig. 2), is represented in this gallery by a fairly full grown mounted specimen and an articulated skeleton. The Dugong inhabits the coastal waters and mouths of estuaries, and feeds on sea weeds. It is once said to have lived in large herds, but 9 its flesh is highly edible and its fat yields a valuable lubricating oil, it has been largely hunted, and its numbers have dwindley down in many areas. This species occurs in the central waters of the Red Sea and the Indian Ocean from East Africa to Australia, frequenting shallow bays. It resembles a small whale in its fishlike form with paddle-shaped front limbs and horizontally expanded tail fin. The female holds her young against her breast with her flippers. The Dugong is said to have given rise to the myth of the mermaid. A photograph showing the Sea Cow in a natural pose in its native haunts is exhibited along with the mounted specimen.

ORDER CETACEA.

The Cetacea constitute another remarkable order of aquatic mammals, including the whales, porpoises and dolphins. They resemble fish superficially, but can always be distinguished from true fish by the presence of a horizontal tail fin and by the absence of gill slits. This group includes some of the largest and bulkiest of all living animals, some species even attaining a length of more than one hundred feet.

This order is divided into two main divisions or suborders, namely, the Mystacoceti, including the Baleen whales in which teeth are absent but baleen plates are present instead, and the Odontoceti, the toothed whales in which teeth are present throughout life, but there are no baleen plates.

The Great Rorqual (*Balaenoptera indica*) a skeleton of which is exhibited in the Skeleton Gallery at the commencement of the Zoological Section is a baleen whale, and belongs to the first group, the Mystacoceti. Sperm whales and delphins, on the other hand, possess teeth and are grouped in the second suborder, the Odontoceti. In the Mammal Gallery, only representatives of dolphins are exhibited, consisting of an entire mounted specimen of one species, and articulated skeletons of this as well as another allied species belonging to the family Delphinidae.

Family DELPHINIDAE.

This family includes all propoises and true dolphins. They are moderate or small-sized animals, perfectly adapted for an aquatic existence, and are often extremely active in their movements. They generally keep together in small groups or "schools". They have low, typical foreheads, and long, flat, beak-like jaws furnished with uniformly developed, narrow, pointed teeth which are well adapted for catching fish on which the dolphins mainly feed.



FIG. 3-STENO PERNIGER: THE ELLIOT'S DOLPHIN.

A specimen of the Elliot's Dolphin (Steno perniger) (Fig. 3), which is one of the commonest species found in the Bay of Bengal and Indian Ocean, is exhibited in this gallery. Its distribution ranges from the Indian Ocean eastwards to Australia and it has been specifically recorded from Vizagapatam and Karachi. The upper parts of this dolphin are dark plumbeous grey and its fins are almost black, but the colour becomes paler on the sides and passes below into a pale pinkish or ashy with a few small dark blotches on the breast and abdomen. Ā fully articulated skeleton of this species and that of another allied species, Prodelphinus attenuatus, the Malay Dolphin, are also exhibited close by, suspended from the ceiling.

ORDER PROBOSCIDIA.

The Order Proboscidia includes the elephants which are the heaviest and bulkiest of all living terrestrial mammals. Their most characteristic feature is the presence of a long proboscis or trunk which serves as a prehensile organ. The incisors are prominently developed to form the conical tusks, which in the males attain **a** very large size. There are no canines, but the molars are large and massive with a broad grinding surface bearing parallel transverse ridges. The limbs are stout, with massive feet, each bearing five toes.

The Order Proboscidia includes only one family, the Elephantidae, to which the two living species of elephants, the Indian and the African, belong. In the remote geological ages the Proboscidia comprised a much greater number of species, including the giant. Mastodons and Mammoths, but the two species mentioned above are the sole survivors of this great group. The African species is distinguished from its Indian cousin by its larger size. enormously large ears and the rhombus-shaped ridges on the surface of the molar teeth. These ridges are linear and parallel in the Indian Elephant.

Family ELEPHANTIDAE.

The Indian Elephant Elephas maximus is represented in this gallery by a large, fully articulated skeleton of the notorious solitary Arcot rogue elephant, exhibited in the centre of the gallery. The animal to which the skeleton belonged was a fully grown tusker of exceptionally large size, said to have been eleven feet in height, with a pair of enormous tusks. This specimen had killed two men, and was eventually captured near Chengam, South Arcot district, in 1887. A skeleton of a much smaller female specimen is exhibited in the Skeleton Gallery.

The distribution of the Indian Elephant ranges over the more heavily forested regions of India, Assam, Burma, Siam, Cochin China, the Malay Peninsula and Sumatra. The elephants inhabiting Ceylon are sometimes classed as a separate race, (*Elephas* maximus zeylanicus). Elephants generally prefer wooded areas covered with tall vegetation, especially where the bamboo abounds. They are generally found in large herds, keeping to the denser forests in the dry season and coming out into the open glades and cultivated areas during the rains.

Old bulls sometimes stay away from the herd as solitary individuals and often become dangerous and wild in temperament when they are termed "rogue elephants". The food of elephants consists of various kinds of grasses and leaves, stems and leaves of wild bamboo and various species of cultivated crops. An adult consumes an enormous quantity of food, eating not less than about 600 pounds of green fodder each day.

The Indian Elephant is easily tamed and is very largely employed for purposes of transport in teak and rubber plantations, and in wild life sanctuaries. In the Mudumalai and Periyar Game Sanctuaries in South India, wild elephants are rigidly protected and conserved.

ORDER ARTIODACTYLA.

In the older system of classification, all the hoofed herbivorous mammals together with the elephants were clubbed together under one large order—the Ungulata—which was divided into three easily distinguishable suborders, namely, the Proboscidia including the elephants only, the Perissodactyla, or the odd-toed Ungulates, and the Artiodactyla comprising the even-toed Ungulates, but at present all these three groups have been separated as independent orders. Of these, the Order Perissodactyla includes the odd-toed hoofed mammals such as the horses, tapirs, and rhinoceroses, representative exhibits of which are displayed only in the General and Foreign Animals galleries, and these have therefore been dealt with in an earlier Guide dealing with those galleries.

In the Mammal Gallery, however, only the Order Artiodactyla is represented, but the exhibited collection of this group is fairly rich and representative of the South Indian fauna of this large and extensive group, and additions are being made systematically to replace old and faded specimens belonging to this important order and to enrich the collection so as to include species hitherto unrepresented in this gallery.

The Artiodactyla includes by far the vast majority of living Ungulates comprising the following main groups: (1) Pecora, or the Ruminants, including among others, the families Bovidae (sheep, oxen, antelopes, etc.), and Cervidae (deer); (2) Tragulina including the family Traguildae (Mouse Deer); (3) Tylopoda, including the family Camelidae (camels); (4) Suina including the family Suidae (pigs), and the Hippopotamidae, comprising the Hippopotamus which is confined to Africa.

Among the families mentioned above, only the Bovidae, Cervidae, Tragulidae and the Suidae are represented in South India and hence the specimens of Artiodactyla exhibited in the Mammal Gallery belong only to these four families. The chief characteristics and habits of the species to which the exhibited specimens belong are briefly outlined below under their respective families.

Family BOVIDAE.

This is the largest family of the Order Artiodactyla. It includes all species of oxen, sheep, goats, both domestic and wild, and also the antelopes and gazelles. They are mostly animals of large size, possessing permanent horns, usually in both sexes. One of the most characteristic features of this family is that the horns are composed of a bony core; encased in a horny sheath. The animals included in the family Bovidae are therefore otherwise know as the *Cavicornia* or hollow-horned Ruminants.

Almost all the specimens of this family exhibited in this gallery belong to wild species. The common domestic humped cattle of India belongs to the species Bos indicus, the ancestor of which was probably African. But it seems that all the wild species of oxen such as the bison, tsaine, yak and wild buffalo have made their respective contributions to the origin of the domestic breeds of cattle. An unusually small skeleton of a full grown specimen of a diminutive trotting bullock belonging to this domestic species is exhibited in this gallery. Among the wild Indian species of oxen, only two species, Bos gaurus, the Gaur or Indian Bison, and Bubalus bubalis, the wild Buffalo, commonly occur in forests over the greater part of India and these two species are represented in this gallery by mounted heads, horns, skulls and photographs depicting them in their native haunts. The heads, horns, and skulls are mounted on shields and displayed high on the walls.

The Gaur or Indian Bison (Bos gaurus) is a massively built animal inhabiting the hill forests of India, and appears to be the largest of existing Bovines. It is essentially an animal of the hills and in South India, it inhabits the Nilgiris and is particularly common in the Mudumalai Sanctuary. They generally live at elevations between 6,000 and 7,000 feet in the hills of Peninsular India. They graze early in the mornings and again late in the afternoons, retiring to rest during the hot hours of the day. They feed chiefly on grass, but also often eat the leaves and barks of trees. Their senses of sight and hearing are poor. They are gregarious and live in large herds.

The Wild Buffalo (Bubalus bubalis) is widely distributed in India, but is absent from Southern and Western India. It inhabits the plains of the Ganges and Brahmaputra in Assam and the grass jungles of Nepal and the Terai. Its distribution also extends to parts of Orissa and to the South-eastern districts of Madhya Pradesh. It is a heavily built animal with a massive body and short, thick legs with large hoofs. Its horns are very large, flattened, strongly transversely ridged and extends forwards in a very broad and widely diverging curve. The Wild Buffalo frequents grass jungles and swampy localities. It is often found in herds, numbering sometimes as many as fifty individuals. It is said to be the boldest and most savage of Indian Bovines and may often attack man without provocation. Its senses of smell and hearing are very acute.

Numeorus species of Wild Goats occur in the Himalayan Region, Tibet, Ladak, Sikkim, Punjab and mountainous regions beyond Indian limits, such as the Russian Pamirs, but in South India there is only one species of the Wild Goat, namely, the Nilgiri Wild Goat, or the Nilgiri Tahr.

The Nilgiri Wild Goat (*Hemitragus hylocrius*) (Fig. 4) is a near relative of the Himalayan Tahr. It is a fairly large, robust species of goat, slightly larger than the Himalayan Tahr. Its hair is short, crisp and coarse. Its horns are stout, rounded, almost touching at their bases, strongly curved backwards, and gradually diverging behind. The animal is usually dark yellowish brown, but does and young bucks are generally grey and old bucks are very dark brown or almost black with a distinctive light saddle-shaped patch. The distribution of this species ranges over the Nilgiris to the Anamallais and over the Western Ghats southwards at elevations ranging from 4,000 to 6,000 feet. They are found usually in herds of five or ten to fifty or sixty individuals among the rocky precipices and crags above the forested zone in the hills. They graze early in the mornings and again late in the afternoons, retiring to rest during the hottest part of the day. When they thus retire to rest, one for more of the does usually act as sentinels. They are as wary as any of the other northern species of Wild Goats. Sometimes this species is wrongly termed the Ibex, which is an entirely different



FIG. 4-HEMITRAGUS HYLOCRIUS : THE NILGIRI WILD GOAT.

species found in the Himalayas and mountain ranges of Central Asia. Two entire mounted specimens (a male and a female), a mounted head and a skull of the Nilgiri Wild Goat are exhibited in this gallery.

Antelopes and Gazelles constitute another distinct subgroup of the family Bovidae. As a group, they stand quite apart from the oxen and the sheep and goats. They are the earliest known Ruminants and as they are more generalised in structure they are believed to represent the original stock from which both oxen and the sheep had been derived. In their general structure antelopes and gazelles resemble the other members of the family Bovidae. They are animals of graceful build, generally with elegant, cylindrical, lyreshaped horns, frequently traversed by prominent transverse ridges. One of the characteristic features of antelopes is the presence of a gland beneath the eyes.

Except the Chiru or Tibetan Antelope which is confined to Tibet and adjacent territory, all the other Indian members of this group, namely, the Indian Antelope or Black Buck, the Four-horned Antelope, the Chinkara or Indian Gazelle and the Nilgai or Blue Bull, the distribution of all of which extend at least to parts of South India, are represented in this gallery.

The Black Buck or Indian Antelope (Antilope cervicapra) (Fig. 5) is the only representative in India of the genus Antilope.



FIG. 5-ANTILOPE CERVICAPRA: THE BLACK BUCK OR INDIAN ANTELOPE.

It is found practically all over the Indian plains except on the Malabar Coast. As a rule, it is absent from forests and hilly It is an exceedingly graceful animal with a fine pair of areas. elongated spiral horns. It is exclusively Indian and is one of the most beautiful of all Indian species of mammals. Young ones and does are yellowish fawn but as the bucks grow older the coat turns darker and in South India the adult bucks are dark brown, but in other parts of India they turn completely black or blackish brown. The coat especially bears a rich and velvety lustre after the rains. The Black Buck is usually found in herds of twenty or thirty individuals, but sometimes much larger herds may be seen. They frequent open plains, grassland and scrub jungle or cultivated fields and feed on grass and various cereal crops. They usually graze in the mornings and again late in the afternoon, resting during the hot hours of the day. Their sense of sight is very keen and they are extremely swift and graceful in their movements. One or two young ones are produced at a time. The Indian Antelope

is represented in this gallery by a mounted head with horns, an articulated skeleton and an entire fresh mounted specimen which was recently acquired to replace an old and faded specimen.

The Four-horned Antelope (Tetraceros quadricornis) (Fig. 6) and the Nilgai are grouped in a separate subfamily, the Tragelaphinae (which contains more of African species) distinguished from the true antelopes mainly by the nature of the horns which



FIG. 6-TETRACEROS QUADRICORNIS : THE FOUR HORNED ANTELOPE.

are keeled in front and not ringed as in the true antelopes. In the Four-horned antelope, the females are hornless and slightly smaller in build, while the males have two pairs of horns. Of these the front pair are always shorter and are often reduced to mere bony protuberences under the skin. This is the condition in the specimen exhibited. A characteristic feature of this species is the presence of a pair of glands between the false hoofs of the hind legs in both sexes. The animal is dull reddish brown above and white beneath. This species occurs throughout the hilly and lightly wooded localities in Peninsuar India, south of the Himalayas, but 's absent from the Malabar coast. It frequents hilly or rugged country and is often found solitary or at most in pairs. It is shy and wary and progresses by a peculiar jerky motion consisting of a series of short leaps. It is easily tamed, but at times it can attack men savagely with its small but sharp horns. A mounted head and an entire mounted specimen recently acquired are exhibited in this gallery, but a skull with only the hind pair of horns well developed is also exhibited in the General Gallery of comparative skeletal structures at the commencement of the Zoological Section.

The Nilgai or Blue Bull (Boselaphus tragocamelus) is represented only by a skull in this gallery. It is a fairly large-sized animal of rather heavy build and ungainly appearance. The adult male bears a coarse, iron-grey coat and two white spots on each cheek. It has stout, short, conical horns, distinctly keeled. This species occurs all over the Indian Peninsula from the foot of the Himalayas to Mysore, except Eastern Bengal, Assam and the Malabar Coast. The Nilgai is usually found in thinly forested, hilly country and in scrub or grassland in rugged country on the plains. It often enters cultivated fields and causes much damage to crops. It is extremely swift in its movements and can gallop at great speed. It is generally found in small herds numbering about four to ten individuals. It feeds mostly on the leaves and fruit of the ber tree (Zizyphus jujuba) and other trees.



FIG 7-GAZELLA BENNETTI: THE CHINKABA OR INDIAN GAZELLE. The Chinkara or Indian Gazelle (Gazella bennetti) (Fig. 7) is a small, slender animal of the size of a small goat, with a graceful

build. The body is light chestnut above, gradually darkening below where it joins the white coat of the under side. Horns are present in both sexes and are characteristically ringed, the horns of the male being almost straight when viewed from the front, but slightly bent in the form of a broad, S-shaped curve when viewed from the side. The horns are sometimes absent in the females. This species occurs all over the plains and low hills of North-western and Central India as far south as the Krishna River in South India. Gazelles frequent waste lands and thinly wooded localities. They are shy and wary and seldom enter cultivated fields. They feed on grass, leaves and various crops and fruits. They are capable of surviving for long periods completely without water, especially in desert country. They are generally found in small herds numbering about ten to twenty individuals. The entire mounted specimen exhibited in this gallery was acquired a few years ago from the Aranmore Palace at Ootacamund.

Family CERVIDAE.

This family includes the true deer. They are widely distributed both in the eastern and western hemispheres, but they are not known in Africa, south of the Sahara and in Australia. The deer are distinguished from the members of the family Bovidae by the horns being in the form of solid bony antlers, without a core or horny sheath. These antlers are shed periodically. In the Indian species, the horns are present only in the males, except in the case of the Musk Deer, in which the horns are absent in both sexes. The horns of deer are composed of true bony material and during their growth they are covered by a soft, hairy skin known as the "velvet" which dries up and peels away when the horns are fully grown. Most of the larger species of deer are gregarious and the colour of the coat in most of the deer undergoes well marked seasonal changes.

About eight species of deer are recorded from within Indian limits, but of these, the distribution of only three species extends into Southern India, namely, the Sambar, the Spotted Deer and the Rib-faced Deer or Muntjac, and entire mounted specimens of only these three species are represented in this gallery. However, specimens of horns, skulls, etc., of the Kashmir Stag, the Thamin or Brow-antlered Deer and the Swamp Deer which are not found in South India are also mounted on shields and exhibited on the walls in this gallery. Some of these horns and skulls were presented to this Museum by the Bombay Natural History Society.

The Chital or Spotted Deer (Axis axis) (Fig. 8) is one of the commonest Indian species of deer and is found practically throughout the Indian Peninsula from the forests at the foot of the Himalayas southwards and extending even to Ceylon. It occurs wherever the land is sufficiently wooded and where there is an adequate supply of water available. It is particularly common, in bamboo jungle. It attains a larger size in the Himalayan foothills and in the jungles of the Terai, but in South India it rarely



FIG. S-AXIS AXIS : THE CHITAL OR SPOTTED DEER.

exceeds a height of about two and half feet. It frequents grassy meadows and forested glades, and especially the vicinity of shaded streams and rivulets. It is often seen in herds of about ten to thirty individuals, but much larger herds may also be sometimes seen. This is one of the most beautiful species of deer, with a bright rufous fawn coat profusely spotted with white all over. It freely enters cultivation and is often found in association with other wild animals of the woods. One to three young ones are born at a time. This species is represented in the Mammal Gallery by an adult mounted specimen, a six-days old young one in which the spots have not yet appeared, and two mounted skulls.

The Muntjac or Rib-faced Deer or Barking Deer (Muntiacus muntjak) is slightly smaller in size than the Spotted Deer, the height of an adult male at the shoulder being only about twenty to thirty inches. The horns, which are present only in the males, are set on bony pedicels covered with hair. These pedicels are continued downwards on each side of the face as prominent bony ridges; this feature accounts for its popular name, "Rib-faced Deer". In the females the horns are replaced by tufts of

Bristly hair. The colour of its coat is a deep chestnut becoming darker on the back and paler below. This species is widely distributed, being found thorughout India, Durma and Ceylon, and even extending in its range to the Malay Peninsula, Japan, China and Formosa. It is found in all thickly wooded hills. In the Himalays and in the hills of South India it occurs up to an altitude of 5,000 to 6,000 feet, and sometimes even at higher elevations. It is never found in the plains. It is usually seen singly or in pairs or sometimes in small family parties, and keeps more or less to thick jungle, but may be seen coming out to graze at the edge of the forest or in jungle clearings. Its call resembles the bark of a dog; hence its popular name, " Barking Deer ". Usually one, but sometimes two young are born at the beginning of the monsoon. The young are spotted with white, but the spots disappear in the adult. Entire mounted specimens of a male, a female and a voung one are exhibited.

The Sambar (Rusa unicolor) (Fig. 9) is the largest of Indian deer. It attains a height of nearly five feet at the shoulder. The hair on the skin is coarse and the neck and throat of the adult



FIG. 9-BUSA UNICOLOR: THE SAMBAR

male are covered with long hair forming a mane. The antlers are large and massive, with a coarse and rugged surface, and normally bear three points. The cok ur of its coat is uniformly dark brown with a yellowish tinge. The females are lighter brown Old males are generally very dark-almost black. This species is found practically throughout India, Burma and Cevlon and eastwards also in the Malay Peninsula and the Philippines. It inhabits forested country and wooded slopes of hills, usually not far from cultivated areas. In the Himalayas it ascends to elevations of nearly 9,000 to 10,000 feet, and in South India it is common on the tops of the hill ranges. It feeds on grass, leaves and wild fruit and is nocturnal in habits, feeding during the night and retiring to rest during the day. It is found in small parties of about four or five, or at most up to a dozen, and stags and hinds are often seen singly. It drinks water freely and can swim very well. Its sense of scent and hearing are very acute. Its call resembles a loud, metallic, bellowing sound. The Sambar is represented in this gallery by a skull, a pair of horns, a mounted head, an entire articulated skeleton and a full-grown mounted specimen that had been recently acquired.

The remaining three species of deer, of which only horns and skulls are exhibited, namely, the Kashmir Stag or Hangul, the Thamin or Brow-antlered Deer and the Swamp Deer, do not occur in South India.

The Kashmir Stag or Hangul (*Cervus hanglu*) is a large, heavily built species of deer, very majestic in appearance, with fine, massive, spreading antlers, and is confined to the valley of Kashmir and adjacent territories. It is essentially a deer of forests and is found singly or in small parties at very high altitudes in the mountains (about 9,000 to 12,000 feet). In winter and early spring it descends to lower elevations. A pair of horns of this species are exhibited.

The Thamin or Brow-antlered Deer (Panolia eldi) is another beautiful species of moderately large-sized deer occurring in Manipur, Assam and Burma, Siam and the Malay Peninsula. It frequents open scrub jungle or rugged open country between rivers, living in small herds of from ten to fifty individuals or more. It is nocturnal in habits. The horns are very large and coarse with an extremely long, curved brow-antler. A single skull of this species, with the horns intact, is exhibited in this gallery mounted on a shield on the wall. A photograph depicting a habitat group of the Thamin is also exhibited in the show case containing the Barking Deer.

The Swamp Deer or Barasingha (*Rucervus duvauceli*) is a largesized deer with moderately fine hair which is rather woolly in texture. The colour of its coat ranges from rufous brown to yellowish brown. The young are spotted. This species is confined to North India and occurs in Teraı, Uttar Pradesh, Assam, Sunderbans and Madhya Pradesh. The horns are smooth, rather elaborately branched and bear twelve tines or points. This species is

highly gregarious and lives in large herds mostly in swampy and marshy areas. A single pair of horns of this species are exhibited.

Family TRAGULIDAE.

This family is classed under a separate subdivision of the Artiodactyla, namely, the Tragulina, which differs from the Ruminants in the presence of a three-chambered, instead of a fourchambered, stomach. The family Tragulidae includes the so-called Mouse Deer or Chevrotains. Antlers are absent, but as in the Musk Deer, two small tusks are present in the upper jaw, and these are better developed in the male. This family is represented in India by a single species, the Indian Chevrotain or Mouse Deer, which is one of the smallest known species of living Ungulates.

The Indian Mouse Deer or Chevrotain (Moschiola meminna, previously better known by its synonymous name, Tragulus



FIG. 10-MOSCHIOLA MEMINNA: THE INDIAN MOUSE DEER OR CHEVROTAIN.

meminna) (Fig. 10) is a tiny deer-like animal with very slender limbs and rather high hind quarters. The colour of its coat is olive brown, minutely speckled with yellow, giving it a greenish olive tinge. The sides of the body are marked with elongate white or buff spots, the spots elongating into linear bands posteriorly. It is shy and secretive in its habits, and its protective colouration makes it difficult to detect its presence in its native haunts. It occurs in forested tracts in Ceylon and South India up to an altitude of about 6,000 feet, inhabiting rocky slopes of the hills and taking shelter in the crevices of the rocks and boulders during the heat of the day, and never venturing into the open country. It walks on the tips of its pointed hoofs, and this gives its gait a peculiar, rigid appearance. The males are generally seen alone.

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This species is very timid in disposition and is easily tamed. Generally, two young are born at the end of the rainy season. Two adult and two young mounted specimens and one entire articulated skeleton are exhibited. Of the two adult specimens, one is a comparatively fresh specimen being a recent acquisition from the Madras Zoo.

Family SUIDAE.

This family is grouped under a separate division of the Artiodactyla, namely, the Suina, and includes the Pigs, Wild Boars and Pigmy Hogs. The range of distribution of this family extends throughout the greater part of Europe, Asia and Africa. They are the least specialized among the living Ungulates, and are characterized by the presence of an elongated head, with a rather expanded, truncated, snout ending in a flat, disc-like structure bearing the nostrils. The feet are narrow, with four completely developed toes in each. The teeth are variable in number, but the common pig bears a complete dentition possessing the full complement of forty-four teeth. The upper canines curve upwards and outwards. This family contains a large number of extinct forms, but the living species are confined to the single genus Sus.

Only one species, the Indian Wild Boar (Sus cristatus) occurs in South India; and this is the only species represented in this gallery.



FIG. 11- SUS CRISTATUS: THE INDIAN WILD BOAR.

The Indian Wild Boar (Sus cristatus) (Fig. 11) is a fairly large-sized species of wild pig, growing to a height of about three

eet at its shoulders. The colour of its coat is black, but there are also grey, rusty brown or white hairs mixed with the black ones. There is a distinct mane of black bristles along the nape reaching down to the back. The young are brownish. In the males the tusks are well developed and both the upper and lower tusks curve outwards projecting out from the mouth. The Wild Boar is widely distributed, occurring all over India, Burma, Siam, Cevlon and the Malay Peninsula. It inhabits grassland and open country sparsely overgrown with bushes. Sometimes it is found in forests and also among high corps. It is omnivorous, feeding on crops, roots, insects, snakes and even carcases, especially early in the mornings and late in the evenings, but it also feeds frequently at nights. It subsists mostly on roots of plants growing in marshy areas, and is extremely destructive to crops. The female and young are as a rule found associated in herds numbering usually about ten or twelve individuals, while the males are found alone. Wild Boars are prolific breeders, about four to six young being born at a time. They are protected by the mother in a kind of shelter made of grass which the boars cut for themselves.

An adult mounted specimen, a young one, an entire articulated skeleton and a skull of this species are exhibited in this gallery. The ordinary domestic pig of India is derived from the Wild Boar and at times it breeds with the Wild Boar in certain places. An abnormal eight-limbed freak embryo of the domestic pig, preserved and mounted in alcohol is also exhibited in this gallery. Such freaks are of fairly common occurrence and are occasionally obtained from slaughter houses.

ORDER CARNIVORA VERA.

(FISSIPEDIA.)

The Carnivora constitute a large and highly evolved order of mammals comprising the cats, dogs, civets, mongooses, hyaenas, weasels, badgers, otters, raccoons and the bears and their allies. The most characteristic features of the Carnivora relate perhaps to the nature of their teeth which are modified in relation to their carnivorous habits. The incisors are small and inconspicuous, but the canines are large, well developed and pointed and adapted for tearing flesh. The fourth upper premolar and the first lower molar are enlarged and strongly cuspidate; and are specially modified for cutting flesh; hence they are called the "carnassial" teeth and these are very characteristic of Carnivore dentition. The Carnivora are also more highly specialized than the Insectivora and have a better developed brain. They are predominantly predatory in their habits and most of them are flesh-eaters, but some species, such as the bears and mongooses have become adapted to a more or

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less omnivorous diet, and a few semi-aquatic forms such as the otters are essentially fish-eating in their habit.

According to the earlier classification, the aquatic Carnivora such as the Seals, Sea Lions and Walruses were grouped as a suborder of the Carnivora, namely, the Pinnipedia, while the land Carnivora were classified under another suborder, the Fissipedia. But at the present day, the Pinnipedia are treated as a separate order and the terrestrial Carnivora are grouped in a distinct order, the Fissipedia (or Carnivora Vera). The Fissipedia alone are represented in the Indian Region. These are ordinarily adapted to a terrestrial habit, but some have taken to an arboreal or semiaquatic mode of life.

The Carnivora Vera or Fissipedia are divided into two main groups or suborders, namely, the Aeluroidea, comprising the cats, civets, mongooses and hyaenas, and the Arctoidea, which includes the rest of the Carnivores, comprising the dogs, jackals, bears, raccoons, otters, badgers, martens, weasels, etc. The suborder Aeluroidea includes four families represented in India, namely, Felidae, Hyaenidae, Viverridae and Herpestidae, and specimens belonging to all these four families are exhibited in this gallery.

SUBORDER AELUROIDEA.

Family FELIDAE.

This family includes the members of the Cat tribe comprising the lions, tigers, leopards, lynxes, domestic cats and their allies, and constitutes the most highly specialized group of flesh-eating mammals. These animals are specially adapted for capturing and killing other animals for food. The Cat family is distinguished from the other families of Carnivora by the head being rounded and by the pressence of powerful canines and well developed carnassial teeth which are eminently adapted for cutting and tearing flesh. The remaining teeth in the series of molars are small and poorly developed. The claws are also strongly developed and adapted for securing a powerful grip over their prey. The claws are retractile and this enables the members of the Cat family to walk noiselessly and approach their prey stealthily. Almost all of them are nocturnal in their habits and their senses of sight, hearing and smell are very acute.

Many species of this family, found in South India are represented in this gallery by entire mounted specimens, but skeletons, skins and skulls are also exhibited.

The Asiatic Lion (Panthera leo persica) is represented in this gallery only by a single skull exhumed from the grounds of the Madras Zoo some years ago. In India the lion is at present confined to the Gir Forest of Kathiawar, but formerly it had a much wider range of distribution extending over Northern and Central India. The habitat of the lion is among the teak trees, banboos and thorny shrubs which abound in the Gir Forest. It rests during the day and goes out in search of its prey at dusk. Its prey consists mainly of cattle and game animals of the forest. Recently, an entire mounted specimen of a male African Lion has been added to this gallery.

The Indian Tiger (*Panthera tigris*) (Fig. 12) is found practically throughout India, from the Himalayas to Cape Comorin, with the exception of the desert regions in Sind, Punjab and Rajasthan. It attains an average total length of nine to nine and half feet. It has



FIG. 12-PANTHERA TIGRIS: THE INDIAN TIGER (MOUNTED HEAD).

been found even at high elevations on the hills and in the Himalayas it has been recorded at altitudes of 10,000 feet. It usually frequents wet, evergreen forests, but it also inhabits open dry jungles and grassy marshes. The tiger preys upon game animals of all kinds including deer, wild boar and other carnivorous animals such as panthers. If game animals are scarce they take to killing cattle, and scarcity of food sometimes forces them to turn into man-eaters. It is extraordinarily swift in its movements in spite of its heavy build. The tiger is represented in this gallery by a fairly full grown mounted specimen, a mounted head, a skull and an entire articulated skeleton.

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(Fig. 13) is smaller and lighter in build than the tiger and the



FIG. 13—PANTHERA PARDUS FUSCA: THE INDIAN LEOPARD OR : PANTHER (FEMALE, WITH TWO CUBS).

males are about seven feet in average length, while the females are smaller attaining a length of about six feet. Its coat is bright fulvous, ornamented with small, close-set, black rosette-like markings. There is much variation in colour and pattern of markings.

The panther occurs all over India, Burma and Ceylon. It lives in forests as well as in open country in rocky ground or in scrub jungle. The panther is more diurnal in its habits than the tiger and frequently goes about in search of its prey during the day. The panther attacks and devours almost any animal which it can overpower. It is more active and supple in its movements than the tiger, and since it is often found in the neighbourhood of villages and human habitations, it is more to be dreaded than the tiger as a menace to human life and property. In such situations the leopard frequently preys on domestic animals such as sheep, goats and cattle. It is endowed with enormous muscular strength, and occasionally takes to man-eating. A female monuted specimen with two cubs and one entire articulated skeleton are exhibited.

A black variety of the panther, known as the black panther occurs in India. In this variety, the general colour of the coat is uniformly black or very intensely dark brown but the spots can still be made out if the skin is viewed from certain angles in favourable light. A single mounted head of the Black Panther is exhibited. Several other subspecies have been recorded from Nepal, Sikkim, Kashmir and Baluchistan.

The Leopard Cat (*Prionailurus bengalensis*) (Fig. 14) is about the size of a domestic cat, but with rather longer legs. It is coloured and spotted like the true panther, and is found in forested regions



FIG. 14-PRIONAILURUS BENGALENSIS : THE LEOPARD CAT.

of India from Kashmir and the Himalayas to Cape Comorin. It is a beautiful species of Indian wild cat resembling somewhat a miniature panther. It is nocturnal in habits and preys upon small mammals and birds in the forest at night. It is common in the vicinity of villages in Coorg, where it is said to take shelter in hollows of tree trunks and prey upon poultry. Three to four young are born in a litter, and sometimes they become very tame. An adult female mounted specimen and a skull of this species are exhibited.

The Rusty-spotted Cat (*Prionailurus rubiginosus*) is another small wild cat about half to three-quarters of the size of a domestic cat with a smooth, fawn grey coat, prettily ornamented with rusty brown spots and patches arranged in regular linear rows. It is confined to South India and Ceylon, but the South Indian form is distinguished as a separate race distinct from the Ceylon form. It commonly occurs in grassland especially on the dry beds of tanks and in scrub jungle and is partly arboreal in its habits. It becomes quite tame when taken young. Two to three kitten are born in a litter. A female specimen is exhibited.

The Fishing Cat (*Prionailurus viverrinus*) (Fig. 15) is much larger than the Leopard Cat, with a rather stoutly built body, **a** short tail and short and strong limbs. Its fur is coarse and earthy grey, tinged with brown. The markings on the body consist of **a**

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series of elongate spots arranged in more or less regular linear rows. It inhabits forests up to an altitude of 13,000 feet in the Himalayas and in parts of Bengal, Uttar Pradesh and Sind. In South India it



FIG. 15 ---PRIONAILURUS VIVERRINUS: THE FISHING CAT.

is confined to the Malabar Coast where it is commonly found in the streams and backwaters south of Mangalore. It frequents grassy swamps and reed-covered banks of rivers and preys on any animal or bird that it can manage to catch, and has been known to attack even calves, sheep and dogs. It also frequently feeds on fish and fresh water molluscs. An adult female specimen and a skull of this species are exhibited.

The Jungle Cat (Felis chaus) is one of the commonest and mosi widely distributed species of wild cats found in India, and its distribution ranges from North Africa through South-western Asia to India, Ceylon, Burma and Indo-China. It is found practically all over Peninsular India and several races have been distinguished. The South Indian and Ceylon form belongs to the race Felis chaus kelaarti, this being the race that is represented by the exhibited specimens in this gallery. Its legs are rather long and the colour of its somewhat soft and luxuriant fur varies from sandy grey to a bright yellowish grey. The tail is marked with a series of black rings and is tipped with black at its extremity. The Jungle Cat is found all over the country, inhabiting the drier and more open regions especially in grassland and scrub jungle. It usually hunts in the mornings and evenings and preys on small animals and birds. In the vicinity of villages it is often very destructive to poultry. It is extremely strong and swift in its movements which are not unlike those of a small panther. It is easily tamed when taken voung. Two adult mounted specimens (both males), an entire articulated skeleton and a skull of this species are exhibited One of the stuffed specimens is from Kalhatti in the Nilgiris, mounted from a skin presented by Lt. Col. Phythian-Adams in 1955,

Family VIVERRIDAE.

This family includes the Civets, Toddy Cats and Linsangs. Of these, the Linsangs. belonging to the subfamily Prionodontinae, are restricted to the Himalayas, Nepal, Sikkim and Upper Burma, and

the Civets and Toddy Cats or Palm Civets (sub-families Viverrinae and Paradoxurinae respectively) alone are represented in South India. The family Viverridae is distinguished from the Felidae by the presence of five toes in the hind foot, the first toe being invariably present, and the comparatively longer muzzle, pointed snout and shorter limbs. The Viverridae are more primitive and less specialized than the Felidae. Most species of Viverridae possess a pair of large scent glands near the rump. These glands secrete a musky oil which appears to play a significant role during the breeding season. Many of the species are blood-thirsty and may therefore cause great damage to poultry and livestock. Only two species of Civet Cats and two of the Palm Civets are represented in this gallery.



FIG. 16-MOSCHOTHEREA CIVETTINA : THE MALABAR CIVET.

The Malabar Civet (Moschotherea civettina) (Fig. 16) is a species of fairly large-sized Civet confined to South India and occurring on coastal districts and in the Western Ghats. The type specimen is from Travancore. Its coat is dusky grey with transverse dark markings on the back and sides. The tail is ringed with dark bands. The Malabar Civet is found throughout the Malabar Coast, inhabiting forests and richly wooded lowland, and has occasionally been found on the elevated forest tracts of Coorg and Wynaad. This species was once very common in Travancore and in the coastal districts of Malabar, but at present it is rarely seen and appears to be almost becoming extinct. A single adult mounted specimen is exhibited.

The small Civets are included in the genus Viverricula which is represented in this gallery by a single species, Viverricula indica, the Small Indian Civet.

The Small Indian Civet (Viverricula indica) (Fig. 17) formerly known by its synonymous name, (Viverricula malaccensis), is distinguished externally from the large Civets (Viverra and Moschotherea) by the absence of the dorsal crest of hairs. The scent gland is also relatively less well developed. The colour of its coat is usually tawny grey or greyish brown and marked with black spots arranged in more or less regular longitudinal rows on the flanks. However, there is considerable variation in the colour and texture of its coat. It is found all over India from the foot hills of the Himalayas southwards to the Cape Comorin and

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Cyclon. Eastwards its range extends to Burma, Southern China and the Malay Peninsula. Five different races are recognized in India; the specimens exhibited in this gallery belong to the South Indian race, *Viverricula indica indica*. The



FIG. 17-VIVERRICULA INDICA: THE SMALL INDIAN CIVET.

Small Indian Civet lives in holes in the ground or under rocks or thick bush and shrubs, and often perfers ground covered with scrub or long grass. It generally keeps out of heavy forest and frequently comes very near human dwellings, taking shelter in drains and outhouses. Like other Civets, it is nocturnal and bunts by night. It heeds on rats, squrrels, small birds lizards, insects and any other small creatures which it can get hold of. It is more or less omnivorous, and varies its diet with fruits, roots and others vegetable matter. There does not appear to be any definite breeding season. Four or five young ones are born at a time, and the young are guarded by the mother inside a borrow usually excavated under a rock or at the base of a tree. This Civet is easily tamed and is often domesticated for the extraction of the civet from its scent glands. Two entire mounted specimens,



FIG. 18—PARADOXURUS HERMAPHRODITUS: THE COMMON INDIAN PALM CIVET OR TODDY CAT.

a cured skin and a skull of this species are exhibited. Of the two mounted specimens, one, aquired in 1961 is a relatively fresh specimen and shows the real colour and markings of the skin very well.

The Common Indian Palm Civet or Toddy Cat (Paradoxurus hermaphroditus) (Fig. 18) is one of the commonest of Indian Carnivores and is often found plentifully in forested regions all over India except in the deserts of Sind, the Punjab and the North-west Frontier Province. It is a black or blackish brown cat-like animal with long, coarse hair and generally with a pattern of longitudinal stripes on the back and spots on the flanks, shoulders and thighs. It is nocturnal in habits and generally lies curled up by day among the branches or in a hole in the trunks of trees. In the vicinity of towns and villages it usually takes its abode in palm or cocoanut trees, and very often it frequents human dwellings and their neighbourhood, taking shelter in the roofs of houses, dry drains or in outhouses and old ruined buildings. It is very common in and around Madras, and has been frequently found within the Museum buildings, especially inside the roofs. It comes out from its shelter at nights, feeding on birds, small mammals, snakes, lizards, insects and also on fruits. Sometimes it proves very destructive to poultry and plantations. It is specially fond of palm juice which it drinks during the night from the pots hung up on palm trees for collecting the toddy; hence its popular name, "Toddy Cat ". It is easily tamed and becomes an affectionate pet when taken young. Four mounted specimens (two of which are mounted in the form of a simplified habitat group), one cured skin, one entire articulated skeleton and one skull of this species are exhibited.

The Brown Palm Civet (*Paradoxurus jerdoni*) is another species of Palm Civet found in the hill ranges of South India. It has been recorded from the Palni Hills. Nilgiris and in the hills of Travancore, Coorg and Cochin. Two races of this species are distinguished. It is a shy animal confined to the forests and rarely entering human habitations. In Coorg it is said to occur side by side with the Common Indian Palm Civet especially in the coffee plantations. It is distinguished by the rich dark brown colour of its coat, but its habits are more or less similar to those of the Common Palm Civet. A large male mounted specimen from Thomara, South Coorg, and a oured skin of this species are exhibited.

Family HERPESTIDAE.

This family includes the Mongooses. In the older system of classification, this was treated as a subfamily, Herpestinae, of the family Viverridae, but it has now been separated into a distinct family. The Mongooses are distinguished from the Civets by their comparatively small and rounded ears, the claws being elongated, fossorial and non-retrctile and by the anus opening into a sac-like depression, although this character is not well defined in some of the common Indian species. Mongooses have an elongated body with short limbs and bright, bead-like eyes, a sharp, pointed snout and a long, bushy tail. Mongooses are more predatory in their habits than Civets, and although they do take vegetable food also, they are more partial to a carnivorous diet. Mongooses are extre-

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mely agile in their movements and are frequently able to succeed in their encounters with snakes mainly by their agility rather than by any special immunity to snake poison.

Four species of Mongooses are represented in South India and specimens of all these four species are exhibited in this gallery.

The Common Indian Mongoose (Herpestes edwardsii) is the commonest species of Mongoose found all over India from the Himalayan foot-hills to Cape Comorin and Ceylon; westward, its distribution extends to Persia and Mesopotamia. Three Indian races are recognized, of which the South Indian race, Herpestes edwardsii edwardsii, alone is represented in this gallery. The colour of the coat is tawny yellow, its hairs bearing alternate dark and light rings which gives a grizzled appearance to its coat. It inhabits open country, scrub jungle and cultivated lands, hiding under rocks and bushes or in hollows in the base of tree trunks. It hunts both during the day and night, preying on a great variety of animals including rats, mice, snakes, lizards, frogs and insects; even birds' eggs, fruits and roots are eaten. It is destructive to poultry in the vicinity of towns and villages, and is especially adept at killing snakes. It breeds practically throughout the year and produces three litters in a year. An adult mounted specimen and a skull of this species are exhibited.

The Ruddy Mongoose (*Herpestes smithi*) is another widely distributed species of Mongoose found throughout Peninsular India and Ceylon. It has been recorded from Madras, Nellore, Rajasthan, Kashmir and North-west Bengal. It is as large as the Common Indian Mongoose and lives in well wooded regions in Central and Southern India. It is easily distinguished from the Common Indian Mongoose by the tail being tipped with black. Its fur is rather coarse and rough and is greyish or reddish brown with a grizzled appearance. It is restricted to thick forest and its habits have been, seldom observed. A single female mounted specimen from Udayagiri, Nellore district, Andhra Pradesh, is exhibited.

The Nilgiri Brown Mongoose (Herpestes fuscus) (Fig. 19) is a large-sized species confined to the Nilgiri and Travancore Hills and



FIG. 19-HERPESTES FUSCUS: THE NILGIRI BROWN MONGOOSE.

probably also to some other hill ranges of Southern India between altitudes of 3,000 to 6,000 feet. The colour of its coat is blackish brown, minutely speckled with yellow or brownish white. The tail is rather darker. The hair on the tail is longer than on the body. Its fur is long, but not very coarse. It is a large, heavily built mongoose. Like the Ruddy Mongoose, this is essentially a forest animal, and very little is known about its habits. It is fairly common around coffee plantations. It inhabits the densely wooded slopes of the Nilgiris and Travancore Hills. In Ceylon, it is said to be very destructive to poultry. A male specimen in exhibited.

The Stripe-necked Mongoose (Herpestes viticollis) is the largest of all Asiatic species of Mongoose and attains a total length of nearly three feet. Its distribution ranges over the hills of Western Ghats from Bombay to Cape Comorin and to Ceylon. The colour of the coat is variable, ranging from a grizzled steel grey to a rich ferruginous or chestnut-red. A black neck stripe extending from the ear to the shoulder is a distinctive feature of this species. Two races are distinguished. This is essentially a forest species, but it sometimes enters cultivated areas and may be commonly seen hunting for its food in paddy fields. It is very destructive to game animals of the forests including hares, bandicoots, mouse, deer, etc., but frogs, fishes and fresh water crabs, and sometimes fruits and roots are also largely eaten. Little is known about its breeding habits. A male mounted specimen and a cured skin of this species are exhibited.

Family HYAENIDAE.

This finally includes the Hyaenas and is represented in the Indian Region by a single species, the Common Striped Hyaena. In its general appearance and build it resembles the dog tribe, but the characters of its skull and teeth indicate that it is more nearly related to the Herpestidae than either to the Felidae or the Canidae. The head and front part of the body are massive, but the hind part of the body and the hind legs are relatively week. Hyaenas feed mostly on carrion and act as good scavengers. They depend mainly upon their sense of smell for detecting the presence of their food. Their senses of sight and hearing are poorly developed.

The family Hyaenidae includes two genera—namely, the genus *Hyaena*, comprising the Striped and the Brown Hyaenas and the genus *Crocuta* comprising the Spotted Hyaena. The Spotted and Brown Hyaenas are found only in Africa. The Striped Hyaena alone is represented in India.

The Striped Hyaena (Hyaena hyaena) (Fig. 20) is a moderately large animal, the males attaining a length of about five feet, and a height of about three feet. It is dog-like in its general appearance and build, with a massive head; the front part of the body is also massive and powerfully built while the hind quarters are weak and drooping. A heavy dorsal crest of specially long hairs is present. The colour of its coat is variable, ranging from cream or buff to a tawny or dirty grey, with narrow, transverse, tawny or blackish brown stripes on the body and legs. The claws are rather blunt, but strong, slightly curved and non-retractile.



FIG. 20-HYAENA HYAENA : THE STRIPED HYAENA.

The canine teeth are comparatively poorly developed, but the powerful jaws and the large and strongly developed molars are very well adapted for crushing the bones of large animals. The skull is also peculiarly adapted for affording attachment to the powerful jaw muscles.

The Striped Hyaena is found practically throughout the Peninsula of India and its distribution also extends to Southwestern Asia and Northern Africa. In India it is most common in the drier parts. It is usually found in open country, frequenting rocky hills and deep ravines, taking shelter in caves among the rocks. During the day it lies concealed in its den or in high grass or bushes and comes out to hunt for its food by night, being nocturnal in habit. Its food consists largely of carcases of animals that have died of disease or those which have been killed by the larger beasts of prey. It feeds on the remains, including the heavy bones, which are left over. However, occasionally Hyaenas feed also on live animals such as sheep, goats and stray dogs. In some places it takes to the vicious habit of carrying away young children especially in the vicinity of villages. Despite its strength, the Hyaena is a cowardly animal and does not usually venture to attack large animals. Hyaenas utter various weird noises and cries which sometimes resemble the sound of a loud laughter. Mating takes place in winter and the young are born in the hot season. Hyaenas are easily tamed when captured young. A male specimen and an entire articulated skeleton are exhibited.

Family CANIDAE.

This family includes the wild dogs, wolves, jackals, foxes and the various breeds of domestic dogs. They are characterized by a well shaped head, long, pointed snout, large erect ears and somewhat long, slender, but muscular limbs. Their claws are short, stout and non-retractile. They are digitigrade, walking on the tips of their toes. The entire build and structure of these animals are adapted to their habit of securing their living prey by sheer swiftness of their movements. Their sense of smell is extremely keen, and their senses of sight and hearing are also quite acute, enabling them to hunt their prey successfully. Apart from speed, they have also great powers of endurance which help them to chase and outrun their prey. The jaws are elongated to accommodate the more or less full complement of teeth. The canines are long and sharp. The dentition is heterodont, adapted for cutting, piercing and crushing. This family is world-wide in its distribution and includes the domestic dog with its numerous races and breeds.

This family is represented in India by the wolf, jackal, fox and the wild dog. Of these, entire specimens of the last three species are exhibited in this gallery, while the wolf is represented only by a single skull, accompanied by an enlarged photograph of the animal.

The Indian Wolf (Canis lupus pallipes) is a race of the typical wolf (Canis lupus) which has a very extensive distribution, being found throughout the Palaearctic Region. The Indian Wolf, however, is restricted to the Indian Peninsula, south of the Himalayas. It occurs especially in bare and open regions of the plains. In the deserts, it takes shelter from the intense heat by hiding in burrows in the sand dunes. It hunts both by day and night. In the vicinity of human settlements it preys upon cattle and domestic animals and even carry away children when pressed with hunger. The wolf also hunts gazelles, antelopes, foxes and other wild animals in areas remote from towns and villages. Three to nine young ones are born in a litter. Wolves are easily tamed when taken young. The wolf is supposed to be the principal ancestor of the domestic dogs. The Indian Wolf is represented in this gallery only by a skull and a photograph of the animal in its natural haunts.

The Jackal (*Canis aureus*) (Fig. 21) is smaller in build than the wolf to which it is closely related. Its coat is thick, coarse and rather variable in colour. Normally it is yellowish grey, tinged with buff about the shoulders. The Jackal is found everywhere in India and can live in almost any type of environment. It may inhabit humid forested areas or dry open country and deserts. It is nocturnal, coming out to hunt at dusk, and retiring to rest at day-break. Just before dawn or at dusk, its peculiar, long drawn out eerie howling may be heard in the vicinity of fields and villages. The Jackal is found either singly or in herds, especially at night and is one of the common scavangers in the outskirts of towns and villages. Its food consists mostly of carrion of all kinds and animals which it has captured. It may attack any small or



FIG. 21-CANIS AUREUS : THE JACKAL.

wounded animal and sometimes it becomes destructive to poultry and domestic animals. It also feeds on fruits, berries, sugarcane, etc., especially when sufficient animal food is not available. It is secretive in its habits, and not much is known about its breeding habits. Cubs are usually brought forth in an underground burrow or hole. Jackals are liable to attacks of rabies and many cases of hydrophobia have resulted from their bites, both in men and animals. Like the wolf, the Asiatic Jackal is a widely distributed species, but the race represented in South India is *Canis aureus naria*, the Southern Indian Jackal. A male specimen and an entire articulated skeleton of this race are exhibited.

The Indian Fox (*Vulpes bengalensis*) (Fig. 22) is much smaller than the Jackal, the hedy attaining at most a length of one and half to two feet. This is the common fox of the Indian plains. It is a small, rather thin animal with slender limbs. The tip of its tail is black. It keeps to open country and is rarely found in forests. Its distribution extends throughout India from the foothills of the Himalayas to Cape Comorin. It is common in open waste land and country covered with scrub, but it is also frequently found in cultivated lands, especially near irrigation channels and on rocky hills. It lives in a burrow which it digs for itself in the open ground or in scrubland. This burrow always has several openings converging towards a central chamber. The fox comes
out of its burrow at dusk in search of its prey. It feeds on small mammals, lizards, insects and land crabs. It is also attracted to the flight of winged termites which emerge from their burrows just before the onset of rains. Sometimes it feeds on fruits such



FIG. 22-VULPES BENGALENSIS : THE INDIAN FOX.

as melons. It is very graceful and agile in its movements and is able to escape from its enemies mainly by virtue of its agility. A single male specimen is exhibited.

The Indian Wild Dog (Cuon alpinus dukhunensis) (Fig. 23) represented in this gallery is the Peninsular Indian race of the typical Wild Dog, Cuon alpinus, which has a much wider distribution, ranging over Central and Eastern Asia and extending through India to the Malay countries. The present race of the Indian Wild Dog is found throughout Peninsular India south of the Ganges in the more or less forested districts, up to altitudes of about 7,000 to 8,000 feet, but not in the western districts. It is much like a domestic dog in general build, with a very distinctive, rich, reddish brown coat which varies in tone according to the season or locality. It lives in forests and hilly country, and like the wolf, the Wild Dog goes about in packs. It is a ferocious animal hunting its prey in packs, usually by day. A pack consists of about six to twelve individuals. Even large wild animals such as the tiger and the bear fall victims to the determined attack of Wild Dogs.

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of human settlements and hence domestic animals are rarely 'attacked. Usually four to six cubs are born during January and



FIG. 23-CUON ALPINUS DUKHUNENSIS : THE INDIAN WILD DOG.

February and they are sheltered in a cave or a rocky crevice. Two adult mounted specimens (a male and a female) and a skull are exhibited.

Family URSIDAE.

This family includes the bears. These are large or mediumsized heavily-built animals characterized by a big head bearing comparatively small eyes and rounded ears, a heavy body borne on rather short, massive, thick-set limbs and a very short and inconspicuous tail. The paws are short and broad and armed with long, powerful, curved claws, those of the fore-foot being nearly twice as long as those of the hind foot. The sense of smell is very acute, but hearing and sight are poorly developed. They obtain much of their food below the surface of the ground, and the long, curved claws are well adapted for digging the earth. The bears powerful limbs are also adapted for climbing trees. Bears are more or less omnivorous feeding usually on vegetable food, honey, insects, etc., but occasionally they attack and kill other animals for food. The bear's teeth are adapted for crushing hard, fibrous vegetable matter and insects. The molars have flat, grinding crowns, and the carnassials are poorly developed, being scarcely listinguishable from the other molars.

Only a single species, the Indian Sloth Bear, occurs in South India, and specimens of this species are well represented in this gallery.

The Indian Sloth Bear (*Melursus ursinus*) (Figs. 24 and 25) is found practically throughout India in forested regions from the foot of the Himalayas to Cape Comorin and Ceylon. The Ceylon form, however, is distinguished as a separate race, *Melursus ursinus inornatus*. The Sloth Bear is one of the commonest wild animals of India and lives wherever there is sufficient forest to provide



FIG. 24-MELURSUS URSINUS : THE INDIAN SLOTH BEAR.

food. It specially prefers rocky places strewn with boulders among which it can take shelter. It is nocturnal in habit, coming out to hunt for its food shortly before sunset, and retiring to rest before dawn. In cloudy weather, it may be seen hunting even during the day. Its food consists mainly of fruits, insects and honey. It walks long distances in search of its food and climbs trees for their fruit, or shakes down fruits and honey-combs from trees and then descends to the ground to eat them. But its favourite food consists of termites which it digs up from under the earth with its powerful claws. Wherever it occurs, its presence is indicated by holes it digs to get at the termites, or by the marks of its claws on the

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trees which it climbs for the honey. The Sloth Bear is usually found solitary, or two or three of them may be seen together. During the day it rests in caves or in holes in the banks of ravines As a rule, the Sloth Bear is a timid animal, but occasionally it attacks man savagely using its claws and feet. The cubs are



FIG. 25—MELURSUS URSINUS: THE INDIAN SLOTH BEAR (IN ERECT POSTURE: NOTE V-SHAPED WHITE BAND ON THE BREAST).

carried about on the mother's back to and from the feeding grounds. Three specimens (one mounted in a vertical posture, standing up on its hind legs, and the other two on all fours), an entire articulated skeleton and two skulls are exhibited.

Family AILURIDAE.

This family includes the Pandas or Cat Bears. Formerly, the Pandas were classed with the Raccoons of North America and included in a single family, the Procyonidae. But recently, the Pandas have been separated and reclassified into two distinct families—the Ailuropodidae, including the Giant Pandas, and the



FIG. 26-AILURUS FULGENS: THE CAT BEAR OR PANDA.

Ailuridae, comprising the Small Pandas, and the family Procyonidae has been retained solely for the American Raccoons. Among the Pandas, the Giant Pandas have not so far been recorded within Indian limits, and it is only the Small Pandas or Cat Bears that are represented within India. It is distinguished from the members of the Canidae and the Ursidae by the shortness of its penis, the presence of a glandular sac surrounding the anus and the presence of a dense, woolly covering of hair on the soles of its feet.

A single species is represented in the Himalayan Region, and a fairly fresh specimen of this species, recently acquired, is exhibited.

The Cat Bear or Panda (*Ailurus fulgens*) (Fig. 26) is distinguished by its rounded head, large, erect, pointed ears and short, stumpy snout. Its coat is bright chestnut brown in colour, and its tail is encircled by a series of black, ring-like markings. The distribution of the Panda ranges over the Himalayas from Nepal and Sikkim eastwards to Upper Burma and Southern China. Within Indian limits, the Panda lives in the temperate forests of

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the Himalayas at altitudes above 5,000 feet. It spends the day resting among the higher branches of the trees where it lies curled up with its bushy tail wrapped up over its head. The strong, semiretractile claws enable it to get a firm grip while climbing trees. In the evening it descends to the ground in search of its food which consists mostly of roots, succulent grasses, fallen fruits, eggs, insects and their larvae. In captivity it prefers food sweetened with sugar. Usually two young are born during spring. The Panda can be easily tamed and makes an engaging pet. A single specimen, recently acquired, is exhibited.

Family MUSTELIDAE:

This family comprises the Badgers, Weasels, Martens, Ratels and Otters. They are mostly small-sized animals with a long body, short legs and powerful paws armed with pointed, non-retractile claws. One characteristic feature of this family is the absence of the second upper molar; the first upper premolar is also often reduced or absent. Most of them climb well, and are arboreal in habit, but they are equally adapted to life on the ground. Some have taken to a semi-aquatic mode of life.

This family is a rather heterogeneous group, and in the characters of the skull, teeth and in their general appearance and habits, the genera of this family differ a great deal, and based on these differences, this family has been subdivided into six sub-families, including the following groups: (1) Otters, (2) Martens, (3) Weasels, (4) Ferret Badgers, (5) Badgers and (6) Ratels. Of these, the Otters, Martens and Ratels alone are represented in South India, and only representatives of these groups are exhibited in this gallery. The Weasels, Ferret Badgers and Badgers occur, within Indian limits, only in the Himalayan Region and in Assam.

Subfamily LUTRINAE.

The Otters.

Otters differ from the rest of the Mustelidae in a number of external characters which are adaptations in relation to their semiaquatic habits. They are distinguished by the presence of a close coat of waterproof fur, paddle-like feet, a stout, muscular tail, an elongated streamlined body and a cluster of stiff whiskers or vibrissae. They are perfectly adapted to a life in water and feed mainly on fish. Three species of Otters are recorded in South India, and specimens of all of them are exhibited.

The Common Otter (Lutra lutra) (Fig. 27) is distinguished from other Indian species of Otters by its fuller, coarser coat of hair and by the grizzled appearance of its back due to the pale tips of the longer hairs, but this grizzling is less apparent in the South Indian race. The Common Otter is a widely distributed species found in Europe and North Africa as well as in Asia, but within Indian limits, this species is found only in Kashmir, the Himalayas and Assam and in South India. The South Indian race, which alone is represented in this gallery, is designated as *Lutra lutra nair*. It is distinguished from the typical species by



FIG. 27-LUTRA LUTRA : THE COMMON OTTER.

its average smaller size. The colour of its coat on the upper side is a dark Isustrous brown. It is found in cold mountain streams and lakes, living among rocks and boulders or in hollows beneath the roots of trees near the edge of the water. It is sometimes found in large tanks, salt water inlets and tidal streams and occasionally enters the sea. They are usually seen in parties of five or more and live together in a den usually among rocks or in an extensive burrow in the alluvial soil on the banks of streams and rivers; the burrow has several entrances, one of them being generally under water. They are usually nocturnal, and feed mainly on fish, frogs and crabs. They also $\operatorname{sometimes}$ attack aquatic birds and feed even on vegetable matter. They can swim extremely fast and run with considerable speed on land. When fishing, a team of otters generally act together in a circle, chasing a shoal of fish and ultimately surrounding it. Their senses of smell and hearing are well developed. Their usual cry is a sharp yelp. They are easily tamed and make engaging pets. A female specimen from Coimbatore and an entire articulated skeleton are exhibited.

The Smooth Indian Otter (Lutrogale perspicillata), formerly better known by its synonymous name, Lutra macrodus, is distinguished from the Common Otter by its smooth, sleek coat. The colour of its coat is blackish brown or deep rufous or chocolate brown; sometimes it may be lighter, being sandy brown or tawny brown. It is found throughout India from the Himalayas and Sind to the extreme south; beyond India its range extends to Burma. Indo-China and Malaya. This is essentially a species of the plains and occurs even in try regions in North-West India, Central India and the Deccan. It inhabits the margins of lakes and streams and is also found in large tanks and rivers. Sometimes it even enters the open sea. It feeds mainly on fish but when fish are not available it feeds on carbs, frogs and fresh water

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snails. Though adapted for an aquatic life it can progress actively on land and often travels long distances in search of food. When fishing, several otters combine and swim in a huge semi-circle and chase the fish before them. They utter a sharp yelping bark when excited. A male specimen from Cannanore and a skull are exhibited.

The Clawless Otter (Amblonyx cinerea) is the smallest of the Indian species of otters, the head and body together being less than two feet in length and the tail more than half this length. The claws are rudimentary and are in the form of small spike-like protuberences which do not project beyond the toe pads. The colour of its coat is dark brown above, paler below. The South Indian forms are darker in colour. This species is found in the Himalayan foothills from Kulu eastwards to the Assam hill ranges and in the plains of Assam and lower Bengal, and again in the South in the hills of Coorg, Nilgiris and Palnis in the higher altitudes. Beyond Indian limits it occurse in Burma, Southern China and the Malay countries. The South Indian race is Amblonyx cinerea nirnai, which is represented in this gallery. In Southern India this otter is found in hill streams and lakes in the higher elevations of the hill ranges. In the plains of lower Bengal it frequents flooded rice fields and estuaries. Its habits are more or less the same as the other species of otters, but it feeds less on fish and subsists more on crabs, snails and mussels. A single female specimen from the Nilgiris is exhibited.

Subfamily MARTINAE.

The Martens.

This subfamily is represented in South India by a signle species found in the Nilgiris and in the hills of Travancore and Coorg. They are adapted for an active, predatory life on the ground as well as on trees. Their feet are adapted for running and climbing and possess short, sharp, partially retractile claws for seizing their prey. They live in forests and open rocky places and are extremely active both on the ground and on the trees. They feed principally on small birds and mammals.

The Nilgiri Marten (*Charronia gwatkinsii*) (Fig 28) is very similar to the Himalayan Yellow-throated Marten (*Charronia flavigula*). The colour of its coat is a rich deep brown from head to rump, but the front part and shoulders are almost reddish. This species occurs in the Nilgiris and in the higher parts of the hill ranges of South Coorg and Travancore in the Western Ghats. It is rarely found below an altitude of 3,000 feet. It lives in hill forests and is occasionally found in parties of five or six, hunting for its food both by day and night. sometimes on the ground, but more commonly on the trees. It is amazingly onick in its moyements both on the ground and among the branches of trees. It preys mostly on small mammals, birds and their eggs, but also feeds on insects, lizards, fruits and the nectar of the flowers of



FIG. 28-CHARRONIA GWATKINSII: THE NILGIRI MARTEN.

the silk cotton trees, and on the tree tops it usually raids the nests of birds for their eggs and young ones. Martens generally keep to forested areas and avoid the vicinity of human dwellings. A single female specimen is exhibited.



FIG. 29-MELLIVORA CAPENSIS: THE RATEL OR HONEY BADGER.

Subfamily MELLIVORINAE.

The Ratels.

Ratels resemble the Badgers in shape and general appearance. They are well adapted for digging in the earth. They possess a broad, fairly stout body and short, stumpy legs armed with strong, large claws. Their snout is elongated and adapted for rooting in the earth. They are predatory in habits and are essentially carnivorous. A single Indian species is recorded and this is represented in South India by the typical Indian race, *Mellivora* capensis indica.

The Ratel or Honey Badger [Mellivora capensis (Fig. 29)] is a small, bear-like Carnivore with a broad, squat body, short and stumpy legs, small tail and a long, pointed snout projecting over the lower lip and with the feet bearing long and blunt, curved claws. The colour of its coat is grey on the crown and dorsal surface, but the under parts of the body and face are deep black presenting a marked contrast to the pale upper parts. The Ratel occurs practically throughout India from the base of the Himalavas to Cape Comorin, but it is said to be rare in the Madras State and absent from Malabar. In India Ratels live in deserts and dry regions especially in hilly and rugged country. In South India it is found chiefly in the hilly districts where it has facilities for making the holes and dens in which it usually lives. It is exclusively nocturnal and bear-like in its habits. It remains underground during the day and emerges at dusk to hunt. It is essentially a flesh-eating animal preying on small mammals, birds, reptiles and insects, but it also feeds on honey and fruit. In the vicinity of villages it is sometimes very destructive to poultry. It is also known to feed on carrion, and throughout India it is well known for its notorious habit of digging into graves with its powerful claws and feeding on the corpses, and hence it is sometimes popularly known as the "grave digger" in many parts of India. In captivity it becomes very tame. A male specimen and an entire articulated skeleton are exhibited.

ORDER PINNIPEDIA.

The Seals, Sea lions and Walruses constitute the Order Pinnipedia. As mentioned earlier, they are really a group of carnivores specialized for life in the sea and were actually classed as a suborder of the Order Carnivora in the earlier systems of classification. The limbs are short and turned backwards and all the four feet The nostrils and ear-holes are kept closed when the are webbed animals dive under water. They come up to the surface of the water at frequent intervals to breathe. They possess a thick layer of fat or blubber beneath their skin. They occur mostly in the cold northern latitudes in the Arctic, Altantic and Pacific Oceans and in the Baltic and North Polar Seas, but a few are found as far south as the coasts of Mexico and South America. They are not represented in the seas around India. They feed exclusively on other animals, but mainly on fish. Apart from man their only enemies are the Polar Bear and the Killer Whale. This family includes the true Seals, the Eared Seals or Sea lions and Walruses. A single species of the Californian Sea lion, recently acquired

from the Madras Zoo, is represented in this gallery. It has been mainly included in this gallery to represent the Order Pinnipedia which has no Indian representatives, and was hitherto unrepresented in the Museum.

The Californian Sea lion (Zalophus californianus californianus) is the most well known species of the Sea lions, being the one usually exhibited in Zoos and circuses where it is much admired for its amusing antics and feats of balance. They live along the coast of California, their range extending as far south as Mexico, and are sometimes found in enormous herds. They can swim extremely well and can leap up about three feet out of water. They feed mainly on squids, but often also on fish although in captivity they are fed mostly on Herrings. The teeth are pointed and adapted for grasping and tearing the prey. This species of Sea lion may grow to a length of eight feet and weigh about 600 pounds. The pups are usually born in June and live on the shore during the first month or two when they feed entirely on the mother's milk. At the end of this period, the pups learn to swim. The single specimen exhibited is a rather young, imported specimen which died in the Madras Zoo in 1961.

ORDER RODENTIA.

The order includes the squirrels, rats, mice and porcupines animals which formerly constituted the Suborder Simplicidentata under the Order Rodentia, and distinguished by the presence of only one pair of incisors. The hares, rabbits and mouse hares which were formerly grouped in the Suborder Depulicidentata under the Order Rodentia, and distinguished by the presence of two pairs of incisors have now been separated into a distinct order, the Lagomorpha. In popular usage, however, the animals included in both these orders are known commonly as Rodentts, and comprise more species than any other Mammalian order, including approximately a third of all the known species of land mammals.

The true Rodents at present included in the Order Rodentia, comprising the squirrels, rats and mice, possess only one pair of incisor teeth in each jaw and these have enamel only on their front surfaces. There are no canines. They are all animals of comparatively small size and of varied habits. Some are terrestrial, others burrowing or arboreal and a few are semi-aquatic in habits. But all of them are essentially herbivorous animals and gnaw their food with their sharp, chisel-shaped incisor teeth. The molar teeth have flat grinding surfaces and are well adapted for grinding the food that has been cut up by the incisors. This order consists of three suborders—the Sciuromorpha comprising the squirrels, the Myiomorpha, including the rats and mice and the Hystricomorpha, including the porcupines. There are several families in each of these suborders, but only three families (one belonging to each of these suborders respectively), namely, the Sciuridae (squirrels), the Muridae (rats and mice) and the Hystricidae (porcupines) are represented in South India and specimens of these three families alone are exhibited in this gallery.

SUBORDER SCIUROMORPHA.

Family SCIURIDAE.

This family includes the squirrels, flying squirrels and marmots. • Of these the marmots are confined to very high altitudes, and in the Tibetan Plateau they are found at elevations of about 18,000 feet; they are not found within Indian limits. But several species of squirrels and flying squirrels occur in India, and some of these which are found in South India are represented in this gallery.

Squirrels are distinguished by their long, hairy, bushy tail and arboreal habits. Squirrels are adapted for life on the tree tops. Their long bushy tails serve as a rudder during their aerial leaps from branch to branch and their claws which are sharply pointed and curved, are well adapted for gripping. Some of these animals have acquired the power of gliding through the air and are popularly known as the flying squirrels. They are distinguished by the presence of a flight membrane or parachute running along each side of the body between the front and hind legs. When the flight membrane is spread out it acts as a sort of parachute helping the animal to glide long distances through the air. Flying squirrels feed mainly at night.

The Large Brown Flying Squirrel (*Petaurista philippensis*) (Fig. 30) is the only large species of flying squirrel inhabiting the forests of Peninsular India, south of the Ganges. The head and the body together measure about one and half feet and the tail is nearly two feet long in an adult specimen. The colour is rather variable ranging from greyish brown to dark chestnut or sooty black, and various local races, differing in colour are recognized. This large flying squirrel lives in holes of tall trees in India and Ceylon and can glide for distances up to about one hundred and eighty feet at a stretch. The flying leap is always in a downward direction, but finally terminates in an ascent to the trunk or branch to which the flight is directed. It inhabits tree forests usually on the hills and is nocturnal in habits, living in

holes of trees during the day and coming out to feed at dusk. Like most squirrels it feeds on fruits and nuts, and also on the barks of certain trees and even on insects such as beetles and their larvae. When it sleeps it lies curled up like a ball. Flying squirrels breed in holes of tree trunks, but little is known about their breeding habits. They are easily tamed, but do not thrive in captivity. Their voice resembles a loud alarm call, but they also



FIG. 30-PETAURISTA PHILIPPENSIS: THE LARGE BROWN FLYING SQUIRBEL (IN FLYING POSTURE).

make the sharp chattering cry characteristic of many squirrels. Two specimens, one with the parachute spread out and the other mounted inside the hole of a trunk of a tree are exhibited. The one mounted in the hole was obtained in South Coorg in 1914, while the other is a recent addition acquired from the Madras Zoo.

The Indian Giant Squirrel (*Ratufa indica*) (Figs. 31 and 32) is a large species, about the size of a Marten, the head and body measuring about fourteen to sixteen inches in length and the

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tail nearly two feet long. The colour of the upper parts is normally deep ferruginous red (rich chestnut or maroon) or the red is sometimes replaced by black on the shoulders, the middle of the back, thighs and on the tail. There is always a pale band across the top of the head just in front of the ears. The under parts are pale buff or yellowish brown. Several local races, differing somewhat in colour, have been recognized, and three of these races which occur in South India are represented in this gallery, namely, the Malabar Giant Squirrel (*Ratufa indica maxima*), the



FIG. 31-RATUFA INDICA SUPERANS: THE COORG GIANT SQUIRREL.

Coorg Giant Squirrel (Ratufa indica superans) (Fig. 31) and the Bengal Giant Squirrel (Ratufa indica bengalensis) (Fig. 32). All of them are more or less similar in their habits.

The Giant Squirrels inhabit forests, where they keep to the tops of high trees and rarely descend to the ground. They leap from branch to branch with amazing rapidity covering as much as nearly twenty feet in a single leap. They are diurnal and active in their habits and feed chiefly on fruits especially in the early hours of the morning and again in the evenings, resting during the hottest part of the day, when they may be usually seen sleeping stretched lengthwise on a high branch. They are shy and wary animals, but they may be easily located by their loud rattling call which is frequently repeated. They build a large nest of leaves and twigs usually among the branches at the top of å high tree. A single individual may build several nests, most of them being used for sleeping, but one of them is set apart as a nursery. Giant Squirrels normally live alone or in pairs, and when frightened they usually lie flattened against a branch as a means of escape from their enemies.

Two specimens, one of which is from Cochin and a skeleton of a specimen from Trichur of the Malabar Giant Squirrel (*Ratufa iudica maxima*), one specimen of the Coorg Giant Squirrel from

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South Coorg (Ratufa indica superans) (Fig. 31) and a group of the Bengal Giant Squirrel (Ratufa indica bengalensis) (Fig. 32) consisting of a pair of specimens with their original nest of wild mango leaves, obtained from Bugoota in Velikonda Hills, Nellore



FIG. 32-RATUFA INDICA BENGALENSIS: THE BENGAL GIANT SQUIRREL (HABITAT GROUP WITH NEST OF LEAVES).

District, in September 1913, are exhibited in this gallery. A young specimen, from Nellore District, and a skull of the race *bengalensis* are also exhibited in the adjoining case in this gallery.

The Grizzled Giant Squirrel (*Ratufa macroura*) is an allied species occurring in the hill ranges of Southern India and Ceylon. It is distinguished from the ordinary Giant Squirrels by the dorsal surface and the tail being greyish or brownish grey and more or less grizzled with white. The colour of the coat is rather variable, and changes from dark brown to grizzled grey according to the seasons. Its habits are more or less similar to those of the Indian Giant Squirrels described above. It is said that the Grizzled Giant Squirrel, when cornered or frightened, sometimes attempts to escape by sliding down a tree and hiding away in the dense undergrowth in the forest. A single scpecimen from the Shevroy Hills is exhibited. This is about the most northerly locality from which this species has been recorded.

The Striped Squirrels, belonging to the genus *Funambulus* form a distinct group by themselves. They are much smaller than the Giant Squirrels and their head and body attain a length of at most about five or six inches, the tail being slightly longer.

About five species of Striped Squirrels are represented in South India, but of these, Funambulus pennanti, the Five-striped Palm Squirrel, is commoner in the northern parts of India, particularly in the drier parts and although its distribution extends to the dry plains of the South, it is not represented among the exhibited specimens of Palm squirrels in this gallery Specimens of the remaining four species, namely, F. palmarum, F. tristriatus, F. wroughtoni and F. sublineatus are exhibited.

The Three-striped Palm Squirrel (Funambulus palmarum) (Fig. 33) is one of the commonest and best known of the smaller



FIG. 33--FUNAMBULUS PALMARUM: THE THREE-STRIPED PALM SQUIRREL (GROUP WITH NEST).

wild animals of India and is especially common in Southern India, being abundant in the wetter parts of Western and Eastern India. As its popular name indicates, it bears three prominent pale stripes on its back. The ground colour of the back is finely speckled brown varying from greyish or rufescent to almost black and the lower parts are whitish or grey. Two mounted specimens with their crude nest on a branch of a tree, two articulated skeletons and two cured skins of this species are exhibited.

The Jungle Striped Squirrel (Funnambulus tristriatus) is very similar to the preceding species, but is darker and slightly larger. There are three narrow, white longitudinal stripes on the back. It occurs throughout the greater part of the Peninsula of India in forested areas. It is said to be common in Malabar. Only a single cured skin of this species is exhibited.

The Coorg Jungle Squirrel (Funambulus wroughtoni) is closely allied to the Jungle Striped Squirrel, F. tristriatus, but differs considerably from the latter in being larger and of a darker colour. The general colour of the fur is greyish brown, finely speckled with pale yellow and black; there are three pale yellow longitudinal stripes on the back, the middle one being much narrower and shorter than the lateral ones. On the back there is a saddle-like patch of rich chestnut, this being one of the most characteristic features of this species. The under parts are dirty white. This species has been collected only from Coorg, but is said to have been noticed in other parts of South India as well. In Coorg it occurs on the hills at low elevations. It can be distinguished by its large size and the conspicous chestnut colour of the dorsal fur. Like the preceding species, it is confined to forested areas. A single specimen, collected from Tittamati, South Coorg, in 1914, is exhibited.

The Dusky Striped Squirrel (Funambulus sublineatus) is a rather small-sized species, the head and the body together scarcely attaining a length of five inches. The upper parts are dull brown, speckled finely with dull greenish grey. It has four dark brown longitudinal stripes with three pale ones in the interspaces. The lower parts are pale brown, more or less rufescent or dull grey. It is found in the mountainous regions of Southern India, Wynaad, Nilgiris, Palnis and Travancore and also in Ceylon. It is shy and secretive in its habits and feeds on the fruits of the wild Raspberry. Two specimens, one from Tittamati, South Coorg and the other from the Planis are exhibited.

The habits of all the Indian species of Striped Squirrels are more or less similar, but while the Jungle Striped Squirrel, the Coorg Jungle Squirrel and the Dusky Striped Squirrel are animals of forested and hilly areas, the Common Three-striped Squirrel has almost become a commensal of man, living in close proximity to him in gardens, groves and houses in almost all towns and villages, although many specimens of this species also are still found in forest. Like other species of squirrels, it feeds on fruit,

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inuts, young shoots, flower buds and bark of trees. but it is more or less omnivorous, feeding equally well on insects, especially termites and birds' eggs. It may be very commonly seen feeding on the ground around trees and when frightened, it takes shelter in the branches. The female builds a large, untidy nest of grass and leaves in branches of trees or in the raiters of houses. Two or three young are born at a time and they are brought up in this nest until they are able to feed for themselves. One such nest, with two adult specimens, is exhibited.

SUBORDER MYIOMORPHA.

Family MURIDAE.

This is a large heterogeneous and widely distributed family comprising the spiny mice, gerbilles, voles, rats, mice and lemmings. Of these, the lemmings do not occur in India, while the voles are found only in the higher altitudes of the Himalayas, Kashmir, Ladak and Tibet. In South India, this family is therefore represented only by the spiny mouse (subfamily Platacanthomyinae), the rats and ordinary mice (subfamily Murinae) and the Gerbilles (subfamily Gerbillinae), and representatives of all these three groups are exhibited in this gallery. One constant and characteristic feature of the family Muridae is the absence of premolars.

Subfamily PLATACANTHOMYINAE.

This subfamily includes the Spiny mouse which resembles a dormouse in general appearance. The tail is long and hairy and the fur of the upper parts is interspersed with broad, flat spines. A single species, confined to the Malabar Coast, is recorded in India.

The Malabar Spiny Mouse (*Platacanthomys lasiurus*) (or Pepper Rat, as it is sometimes called), is a fairly large mouse, the head and body measuring over four inches in length, squirrel-like in appearance with a long, bushy tail, and well developed. long whiskers. The hair on the tail is shorter towards its base and longer and more bushy towards its tip. The colour is chestnut above, very pale, almost whitish below. The back bears numerous spines mixed with the hair; hence the name Spiny Mouse. It is found in the hills of Southern India, on the Malabar Coast, especially in the Anamalais and Travancore hills at elevations of more than 2,000 feet. It lives in large, old trees; in holes which it makes and lines with leaves and moss. It is said to be very destructive to pepper and jack fruit; and hence the name, Pepper Rat. Two cured skins and two mounted specimens are exhibited.

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Subfamily GERBILLINAE

This subfamily includes the Gerbilles. They are distinguished from ordinary rats by their tail. The tail in Gerbilles is hairy and usually ends in a tassel or pencil of long hair. The hind feet of the gerbille are also much longer than those of the typical rats of comparable size. This enables it to progress by a series of long leaps. Several species are represented in India, but of these, the commonest are the Indian Gerbille and the Indian Desert Gerbille. Of these the former alone is recorded from South India, and is much commoner than the latter.

The Indian Gerbille (Tatera indica) is found throughout India from the Himalayas to Cape Comorin and also in Ceylon. It is light brownish or rufous, its colour usually varying from sandy brown to a fawn colour above. It inhabits open plains and meadows and is commonly found in and around cultivated fields. It makes extensive burrows near bushes and hedges. These burrows have numerous entrances and lead into a single large central chamber, about a foot or more below the surface of the ground. The chamber is lined with a bed of dried grass. Gerbilles are nocturnal, sleeping by day and coming out to feed at dusk. Their food consists chiefly of seeds and grain, leaves, grass and roots. They often collect plenty of grain and seeds in their burrows during harvest to be used later when food is scarce. They are very wary and slip back swiftly into their burrows at the least sign of danger. They are extremely destructive to cultivation. Usually about four young are produced at a time, but eight to twelve young ones have sometimes been seen in a burrow. Two dry-mounted specimens from Madras and one spirit-preserved specimen from Ramanathapuram are exhibited.

Subfamily MURINAE.

This subfamily includes the rate and mice. They have a rather long snout bearing very prominent whiskers, large, round eyes, large naked ears and a long, scaly, almost naked tail. Numerous species are represented in India. Their habits are very varied; some inhabit cultivated fields while others are more or less arboreal, and still others are found in human dwellings as household pests.

One species of the Tree Mouse (Vandeluria), the Common Indian House Mouse (Mus musculus), the Indian Field Mouse (Mus booduga), the Common Field Mouse (Mus famulus), the Indian House Rat (Rattus rattus rufescens), the White-tailed Wood Rat (Rattus blanfordi), the Indian Mole Rat (Bandicota bengalensis), (formerly better known as Gunomys kok) and the Common Indian Bandicoot (Bandicota malabarica) are represented in this gallery, these being the common South Indian species of the present subfamily.

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The Long-tailed Tree Mouse (Vandeluria oleracea) is a beautiful little species with a soft fur, bright chestnut red coat, white underparts, and a very long tail. It is found almost throughout India and is entirely arboreal in its habits. It is very active and agile in its movements among the branches of trees and shrubs, and often uses its tail as a support when climbing. It feeds mainly on fruits, buds and shoots and builds a nest of leaves often in palm or bamboo trees, and occasionally in the thatched roof of houses. The nest is occupied solely by the female and the young ones. The males construct separate nests in which they sleep. A single spirit-preserved specimen from Pallavaram is exhibited, but naturally the pretty colour of the coat has faded almost completely in this specimen.

The Common House Mouse (*Mus musculus*) resembles the Common House Rat in general appearance and build, but is much smaller. Its head and body together measure about two or three inches in length and the tail is about equally long. Its colour varies from dark to light brown above, but the under parts are paler. It occurs all over the Indian Peninsula and lives mainly in houses, but it also frequents gardens and fields in the vicinity of towns and villages. It is extremely active in its movements and is able to climb vertical walls. It is omnivorous, but feeds largely on grain, insects and the remains of human food. About four to eight young are born three to five times a year. The young are born blind, but grow and attain maturity quite rapidly. One spiritpreserved specimen from Madras is exhibited.

The Common Indian Field Mouse (*Mus booduga*) is one of the commonest species of field mice found all over Peninsular India and Ceylon. Its head and body are about two to three inches in length and its tail slightly more than two inches long. The colour varies from a pale sandy grey to dark greyish brown. The underparts are white. Generally the desert specimens are paler. It is common in fields, living in small burrows and is also found sometimes in gardens and woods and occasionally in houses. The entrances to its burrows are marked by a little heap of stones. It forms the favourite prey of the Roller or Blue Jay and bird catchers use it as a bait in catching the Rollers. This is the common "country mouse" of India and like other species of mice, it is amnivorous, feeding on grain, seeds, insects, etc. A single spiritpreserved specimen from Madras is exhibited.

An allied species of field mouse recorded from Coonoor, Mus famulus, is also represented in this gallery, by a single male, wetpreserved specimen collected at Coonoor, South India. It is very similar to the Common Indian Field Mouse, but is larger and bears a proportionately shorter tail. The colour of the upper parts is dark chocolate brown, evenly sprinkled with fulvous and the under parts are brownish yellow. This species has been recorded only from Coonoor, Nilgiris, in Southern India, at an altitude of 5,000 feet. Nothing has been recorded about its habits, but apparently they are more or less similar to those of the Common Indian Field Mouse.

The Common House Rat (Rattus rattus) is represented in this gallery by the typical Indian race, Rattus rattus rufescens. It is very variable in colour. In most Indian specimens, the colour is usually brown above or more or less rufous or occasionally yellowish brown; more rarely it is blackish brown or black. The underparts are generally whitish. This species is found both on the ground, where it burrows and on trees where it builds nests among the branches. It is common in houses everywhere, freuently living in crevices on their oofs. It feeds mainly on grain, fruit and vegetables, but is more or less omnivorous, and eats also, insects, stored products and remnants of human food. It is a regular household pest. This species is world-wide in distribution. and several races have been described, some of them living wild in open country and forested regions, both in the bills and the plains. Two specimens and an articulated skeleton of the typical race of the Indian Peninsula, fufescens, are exhibited in this gallerv.

The White-tailed Wood Rat (*Rattus blanfordi*) is a common wild species of rat inhabiting the dry and evergreen forested zones in Southern, Central and Eastern India as far north as Bengal. In Southern India, it lives mostly in forest, but in Mysore it is also found in the open scrub jungle. The head and body together measure about six to seven inches and the tail is a little longer. A characteristic feature of this species is that the tail is brown for three-quarters of its length, but the terminal portion is white, bearing long white hairs. It has soft, long, for without spines. It has also been recorded from the Nilgiris and the Shevroys in the Madras State. It makes a large, untidy nest usually in a hole in the trunk of a tree. It is largely arboreal in its habits, but in open country without trees it lives on the ground, making its nest under rocks and bushes. A single dry-mounted specimen from the Palni Hills is exhibited.

The Indian Mole Rat (Bandicota bengalensis) was formerly classified under the genus Gunomys and was known as Gunomys kok. It is now more properly included in the genus Bandicota as it is strictly more nearly related to the Bandicoots which it resembles closely in its general appearance and habits. It is found practically throughout Peninsular India from the Himalayas to Cape Concrin. Its fur is coarse and contains piles of long, black-tipped hairs which it erects when excited. It usually lives in cultivated plains and gardens and its presence may always be recognized by the piles of earth resembling large mole hills at the entrance to its burrows. The burrows are often very extensive and form complicated underground galleries. The burrows generally lead into circular chamber about two feet below the ground; but there may be other small circular chambers also. Large quantities of grain are often stored by the rats in these chambers. Its food consists chiefly of grass, roots and grain. It is rather fierce in disposition and erects its long piles of hair, uttering a grunting noise when irritated. About ten to twelve young are produced at a time. A single specimen from Dindigul is exhibited.

The Bandicoot Rat (Bandicota malabarica) (Fig. 34) is much larger and stouter than the preceding species. The head and body together measure twelve to fifteen inches and the tail eleven to thirteen inches. The fur is very coarse with piles of black-tipped long hairs. The colour is blackish brown above, sometimes grizzled with pale yellowish or grey, and the under parts are greyish brown



FIG. 34-BANDICOTA MALABARICA : THE BANDICOOT RAT.

or pale grey. But unlike the Mole Rat, the Bandicoot Rat is essentially a parasite of man, living in and around human dwellings. They are burrowing in habit and cause considerable damage to flooring in houses as they frequently tunnel through the brick work, tiles and masonry. Like other rats, they are omnivorous and feed on grain, vegetables and household refuse and garbage and occasionally even attack domestic poultry. They are very destructive to stored grain in barns and granaries and when attacked, they grunt like a pig. A normal specimen and an albino one, both from Madras, and an entire articulated skeleton are exhibited.

SUBORDER HYSTRICOMORPHA.

Family HYSTRICIDAE.

This family comprises the Porcupines which constitute a distinct group of Rodents. They are readily distinguished by their hair being more or less completely modified into very long, stiff

spines which can be erected at will by powerful skin muscles. The tail is short and spinose, bearing at its tip a bunch of slenderstalked hollow quills. Porcupines have robustly built bodies and are among the largest of Indian Rodents. Three species have been recorded from Indian limits; of these, the Indian Porcupine (Hystrix leucura) is the commonest and most widely distributed species, and is the only one that occurs in Scutt. India.

The Indian Porcupine (*Hystrix leucura*) (Fig. 35) is found all over India from the Himalayas to the Cape Comorin. Beyond Indian limits, its distribution extends to Ceylon and westwards to Persia, Baluchistan, Syria and Palestine. It inhabits both open



FIG. 35-HYSTRIX LEUCURA: THE INDIAN PORCUPINE.

country and forested areas and generally prefers to live on rocky ground on the slopes of hills. It is nocturnal in habit, taking shelter during the day in rocky caves or in burrows which the animal digs for itself. These burrows form extensive underground galleries and lead into a spacious chamber several feet below the ground level. The entrance to the burrow is usually strewn with bones which the porcupine gnaws. It also gnaws the dropped horns of deer. This ensures an adequate supply of calcium which it needs for the proper growth of its quills. The porcupine emerges from its burrows after dusk and feeds mainly on grain, fruit, roots and other vegetable matter. Sometimes it is very destructive to fruit and vegetable gardens and cultivated crops. It has a keen sense of smell, and when excited, it erects its quills, emits a grunting noise and rattles its hollow tail quills. It attacks its enemies by charging backwards with smazing rapidity driving its erect quills. deep into the victim's body, often with fatal results. Even large animals such as the leopard and the tiger have sometimes succumbed to its attack. Two four young ones are born at a time. The young are born with their eyes open and bear short, soft quills which later grow into the formidable spines of the adult. A single male specimen and a skull are exhibited.

ORDER LAGOMORPHA.

This order comprises the rabbits, hares and mouse hares which formerly constituted the Buborder Duplicidentata under the Order Rodentia, but have now been separated into a distinct order. The members of the Order Lagomorpha are distinguished by the presence of two pairs of incisors in the upper jaw, the outer pair being small and placed behind the large inner pair. The upper lip is cleft and the two lobes can be separated revealing an area of naked skin between them. All the species are exclusively herbivorous and terrestrial in habit.

This order includes two families, the Leporidae, comprising the rabbits and hares, and the Lagomyidae which include the mouse hares. The Leporidae alone is represented in South India.

Family LEPORIDAE.

Hares and rabbits are included in this family. The ears are long and their eyes are large, without eyelids. The hind limbs are conspicuously longer and more strongly developed than the fore limbs. The fur consists of thick, soft, woolly hair. Their senses of smell and hearing are well-developed. As a rule they are silent, but when alarmed they utter a loud wailing sound.

Several species of the hare occur within Indian limits, but among them only two are common, namely, the Common Indian Hare and the Black-naped Hare, the latter being the southern form that commonly occurs in South India. This species alone is represented in this gallery.

The Black-naped Hare (*Lepus nigricollis*) is distinguished by the presence of a characteristic dark brown or black patch on the back of its neck, extending from the ears to the shoulders. The upper surface of the tail is black. It is common in the Nilgiris and other South Indian hill ranges. It is frequently found in the vicinity of villages and cultivated fields. It is mostly nocturnal and sleeps during the greater part of the day in hollows which it scoops out for itself in grassy fields. When disturbed it bolts away at an amazing speed and frequently seeks refuge in fox holes or other burrows. One or two young are born at a time. The young are born with their eyes open and are able to fend for themselves almost immediately after birth. A single specimen is exhibited.

The white domestic rabbits are derived from the Wild Rabbit, Oryotolagus cuniculus, which originally came from south-west Europe whence they have spread to most parts of Europe, Australia and other parts of the world. There are now over fifty different races of the domestic Rabbit. Rabbits can be distinguished from hares by their shorter ears which do not have black tips, and the limbs are also shorter.

ORDER INSECTIVORA.

The Order Insectivora comprises the tree shrews, hedgehogs, moles and ground shrews, besides several other allied groups, many of them not found in India. They are mostly small mammals, with short legs and with a long, pointed snout projecting beyond the lower jaw and sometimes forming almost a distinct, mobile proboscis. The limbs are five-toed, the toes being large and provided with sharp claws. These animals vary a great deal in their habits. Some, such as the tree shrews are arboreal, while others, like the moles are burrowing in habit, and yet others feed on the surface of the ground. They are essentially insectivorous, and their teeth are all pointed, with very little differentiation between incisors, canines and molars. The molars are provided with sharply pointed cusps and the whole dentition is eminently adapted to their insectivorous habit. The relatively large number of teeth and their lack of specialization and the poor development of their brain indicate that the insectivores are a primitive group of mammals, with a more or less generalized pattern of organization. The senses of smell and hearing are well-developed, but their, sight is usually poor. Except for the tree shrews, all are nocturnal in their habits.

Several families are included in this order, but only four of them are represented in India. Of the four Indian families, the Talpidae, including the Moles, are confined to the Himalayas and Assam hills, and only the three remaining families, the Tupaidae (tree shrews), the Erinaceidae (hedgehogs) and the Soricidae (ground shrews) occur in South India.

Family TUPAIDAE.

This family includes the tree shrews. They are mostly abroreal Insectivores with a comparatively large brain cavity. In the general form of their body and in their more or less bushy tail they resemble the squirrels but in their long and pointed snout they are more shrew-like. They are exceptional among the Insectivora in being diurnal in their habits. They have so many characters in common with the lower Primates that the modern trend is to class the Tupaidae under the Primates rather than among the Insectivora. Only one species of this family, the Madras Tree Shrew, occurs in South India.

The Madras Tree Shrew (Anathana ellioti) (Fig. 36) is a small, squirrel-like creature, yellowish brown above, and tinged to a varying degree with rusty red on the middle of the back and over the rump. The under parts are nearly white. The head and body together measure about seven to eight inches in length and the tail slightly less. It is found throughout the greater part of Peninsular India, south of the Ganges, particularly in the forested areas. It has specifically been recorded from the Shevroy Hills in South India. Although they are known as tree shrews, they are not exclusively arboreal in their habits, and they spend most of their time on the ground searching for their food and only take to trees usually as a means of escape. They are very active in their movements on the ground, but on the trees their movements are quite unlike those of the squirrel. They



FIG. 36-ANATHANA ELLIOTI: THE MADRAS TREE SHREW.

feed mainly on insects, but they also eat fruits and even small mammals and birds. Usually a single young one is born at a time. Tree shrews are easily tamed. A female specimen is exhibited.

Family ERINACEIDAE.

This family comprises the hedgehogs. They are distinguished by the dense coat of stiff spines which cover the back and sides The snout is narrow and pointed, the body stout and more or less rounded and the legs short and stumpy and provided with simple claws, not specially modified for digging.

Three species occur within Indian limits, of which only one, the South Indian Hedgebog, is found in South India.



FIG. 37—PARAECHINUS NUDIVENTRIS: THE SOUTH INDIAN HEDGEHOG.

The South Indian Hedgehog (*Paraechinus nudiventris*) (Fig. 37) is confined to the plains of South India and is distinguished by the presence of a nude median space on the top of the head, divid-

ing the spines which commence on the forehead in front of a line between the inner angles of the ears. The feet are short and provided with claws. The hair on the lower parts is thin. This species usually inhabits dry areas on the plains of Southern India. They hide in holes in the sand or underneath bushes and hedges and come out at dusk to feed. They feed mainly on insects, worms, slugs, lizards, rats and mice and birds' eggs, but they also eat fruits and roots. When alarmed they roll themselves up into a ball of spines, retracting their head and limbs, and in this position they are well protected. The young are blind when they are born and have soft spines which rapidly harden. They are brought forth in holes lined with grass. Two specimens and a skull are exhibited.

Family SORICIDAE.

This family includes the ground shrews. They are small mammals, with long, pointed snouts and soft fur. The pointed snout projects considerably beyond the lower lip. The eyes are small and the ear lobes rounded and depressed, resembling the human ear in shape. The teeth are distinctive. The two front teeth in the upper jaw are curved and bear a prominent basal cusp. In the lower jaw they are elongated and project horizontally forwards. In some forms, the tips of the teeth are coloured reddish brown. Shrews are often confused with rats, but their pointed snouts, depressed ears and peculiar front teeth distinguish them from the rats.

Shrews are widely distributed and several species occur in India. But only four species of the genus *Pachyura* (Synonyms: *Crocidura* and *Suncus*) are recorded from South India, and these are the only species of ground shrews represented in this gallery.

The Grey Musk Shrew (Pachyura caeruleus) is the commonest species of ground shrew recorded in India and occurs all over the Indian Peninsula. Its head and body together measure about six inches in length and the tail is about three inches long. Its fur is soft and usually bluish grey above and paler below, the hair sometimes bearing ferruginous tips. Its narrow pointed snout is very characteristic. It is sometimes erronously known as the "musk rat". The strong smell of musk emitted by this and other shrews of the genus is produced by a gland on each side of the body. It is nocturnal and commonly enters human dwellings after dusk, feeding mainly on insects. It utters a loud squeaking noise when frightened. It is often mistaken for rats and killed in large numbers, but actually it is beneficial to man helping him to keep down insect pests and vermin. It produces two to three young in a rough nest of straw and dead leaves. The young are born blind, but are quite active. Two wet-preserved specimens (a male and a female) are exhibited.

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The Nilgiri Wood Shrew (*Pachyura nigra*) is a much smaller species, its head and body measuring about three and half inches in length and the tail about two and half inches. Its fur is blackish brown above, tinged with a rufescent shade and dusky greyish over the abdomen. This species is quite common in the Nilgiri hills frequenting forested areas, groves and gardens, especially around Ootacamund. It emits a faint musky odour, produced by the secretion of its lateral glands. A single dry-preserved specimen is exhibited.

The Indian Pigmy Shrew (Pachyura perrotteti) is perhaps the smallest of Indian shrews, its head and body attaining a length of less than two inches and its tail measuring about one and half inches in length. It has been recorded from Southern India, especially in the Nilgiri Hills, and Travancore, but its distribution also extends to Assam and Bengal in the North. Its ears are comparatively large and rounded and covered with very short hair. The colour of its fur varies from reddish brown to dark brown or nearly black above, and paler and greyish brown below. This tiny shrew is doubtfully distinguished from another very small species, the Himalayan Pigmy Shrew (Pachyura hodgsoni) which is confined to the Himalayan region. The two are probably geographical races of the same species. Little has been recorded about its habits. It has been specifically recorded from Madras, Mysore and Jalna in the Deccan. A single female wet-preserved specimen from Coonoor is exhibited.

Bidie's Shrew (*Pachyura bidiana*) (originally named as Stoliczka's Shrew, *Pachyura stoliczkana*) is another medium-sized shrew about the size of the Nilgiri Wood Shrew, recorded from Madras and Bombay. The type specimen of this species was collected at Madras. The colour of the fur is reddish brown above and below, but the under parts bear a greyish gloss. The snout, ears and feet are pale reddish brown and the tail is much darker. This is a little known species, about the habits of which nothing has been recorded. A single wet-preserved specimen from Madras (its type locality) is exhibited.

ORDER CHIROPTERA.

This order comprises the bats which constitute one of the most distinctive groups of mammals. Bats are the only mammals provided with functional wing membranes and they are the only mammals which can fly in the real sense. The wing of the bats consists of a thin, leathery, almost naked skin stretched between the limbs, body and the tail. This flight membrane is principally supported by the enormously elongated bones of the fore arm, the hand and the fingers; the thumb, however, is free and not elongated; it bears a claw and sometimes there is also a claw on the

index finger. Bats are nocturnal and sleep during the day hanging upside down on branches of trees by the curved claws of the hind limbs. The feeding habits of bats are varied. The majority of the species are insectivorous but some are carnivorous and bloodsucking in their habit, and a few are fruit-eating. The structure of the teeth also varies according to their feeding habits. Based on these differences bats are classified into two main groups-the Megachiroptera, including all the fruit-eating bats and the Microchiroptera including all the insectivorous and carnivorous species. The fruit-eating bats are as a rule much larger than the majority of the insectivorous forms. All bats have voracious appetites and consume an enormous quantity of food. Bats have a very keen sense of hearing and touch, but their sight is rather poorly developed. In addition, they have an amazing radar-lke sense of perception by means of which they are able to fly in the dark avoiding all obstacles. Bats which had been blinded were able to fly with ease through a room with numerous strings stretched across it, carefully avoiding all the strings. When flying, bats are able to find their way by their acute sense of hearing; they produce ultrasonic sounds, which are received back as echoes and serve to indicate the positions of the obstacles, somewhat on the principle of echo-sounding.

Among the exhibited series of bats in this gallery, only three species are represented, but there are specimens belonging to a number of other South Indian species, especially of the Insectivorous bats, in the study collections of this Museum.

As mentioned earlier, bats are broadly classified into two suborders, the Megachiroptera, including the fruit-eating bats and the Microchiropetera, comprising the insectivorous and carnivorous bats. Specimens of two species of the former group, belonging to the family Pteropidae, and one of the latter, belonging to the family Vespertilionidae, are exhibited.

SUBORDER MEGACHIROPTERA.

Family PTEROPIDAE.

This family includes the fruit-eating bats, the largest of which are popularly known as the "flying foxes". They have a long snout, claws on both the thumb and the index fingers and the tail is free from the flight membrane, or it may be absent. They are distinguished from the other bats by the nature of their molar teeth which have more or less smooth, broad, grinding crowns divided by a deep, longitudinal groove. The ears are also characteristic. The margins of the ear lobes meet before they reach the head, thus forming a more or less regular, oval ring. They feed on fruits and also flowers rich in nectar.

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The Large Indian Fruit Bat or Flying Fox (*Pteropus medius*) (Fig. 36) is the largest species of bat found in India. It occurs throughout India, Ceylon and Burma, but not in the Himalayas



FIG. 38-PTEROPUS MEDIUS: THE LARGE INDIAN FRUIT BAT OR FLYING FOX (GROUP).

except hear the base. During the day they roost on trees, generally in large colonies, hanging head downwards. Many hundreds of them gather together in a single tree and towards sunset they begin to fly on their nocturnal rambles, often covering long distances in the quest of fruit trees. They feed on most garden fruit and also on neem and figs. At about early dawn they return invariably to the same tree and for several hours they fight and wrangle among themselves incessantly for vantage positions in the tree. A single young one is born about the end of March and is carried about by the mother till the end of May by which time it is sufficiently large and is able to fend for itself. The flying fox is easily tamed, and its flesh is eaten by many classes of natives in India. Six specimens mounted in different postures are exhibited in a simplified habitat group.

The Short-nosed Fruit Bat (*Cynopterus sphinx*) is another species of fruit-eating bat common throughout India from the base of the Himalayas to Cape Comorin. It is much smaller than the flying fox and is found during the day time on trees: it may often be seen roosting gregariously under the folded leaves of the palmyrah palms or plantain trees. Occasionally it is found in caves and hollow trunks of trees. It feeds entirely on fruit and is particularly fond of plantains, guavas and mangoes. Being a voracious feeder, it is very destructive to fruit trees and orchards. Although so different in size and flight, its voice resembles closely that of the flying fox. Its flight is light and buoyant, quite unlike the heavy and laboured flight of the flying fox. A small group of specimens of the Short-nosed Fruit Bat mounted in a hanging posture under the folded leaf of a palmyrah palm is exhibited.

SUBORDER MICROCHIROPTERA.

Family VESPERTILIONIDAE.

This is by far the largest family of bats and includes most of the common species of insectivorous bats found in India. The species of this family are readily distinguished from all other Microchiroptera by the presence of a distinct lobe in the ear known as the *tragus*, and by the absence of the membranous structures called the "nose leaf" present in species of other families. The tail is long, but is not produced appreciably beyond the membrane connecting the hind limbs. The eyes are minute. The species of this family are distributed throughout he tropical and temperate regions of the world. Among the large number of species of this family occurring in India, only one, the Painted Bat, is represented in this gallery, but a few other species are represented by spirit-preserved specimens in the study collection.

The Painted Bat (Kerivoula picta) is a widely distributed species found throughout India (except in the drier parts), Ceylon and Burma. During life, this bat is richly coloured, with a fur of bright orange and striking vermilion red contrasting sharply with the black wing membranes. Its brilliant colour matches so well with the deep reds and yellows of the fading banana leaves among which it usually roosts that it is difficult to detect its This species therefore affords an excellent example of presence. protective colouration in mammals. During the day it hides among the foliage, chiefly of plantain trees. In South India, it has been found in several localities, but is rare in the drier When disturbed during the day time this species is said parts. to resemble a large brightly coloured butterfly rather than a bat. The rich colour disappears immediately on death. Two dry-pre served specimens, collected at Madras, are exhibited, but the original brillant colour has of course disappeared completely in them.

ORDER PRIMATES.

This order comprises man, the spes, monkeys, tarsiers and lemuroids and many members of this order are in some respects the most highly organized forms among the Mammalia. At the same time the lemurs, lorises and some species of monkeys are of comparatively low grade of organization and are less specialized than some of the species belonging to the other orders of Mammalia and the most recent view is that the tree shrews (normally treated as Insectivores) should also be included in this group. It is now believed that the ancestor of the Primates must have very closely resembled the tree shrews. The animals included in the Order Primates are built more or less on the same structural features as The superiority of many of the Primates over other mamman. mals is mainly due to the greater development of their brain and the consequent high degree of intelligence. One of the most distinctive characters of the Primates is that in many of them the thumb and the big toe are clearly separated from, and more freely movable than, the remaining fingers and toes; the thumb and the toe are thus "opposable" and enable the hands and feet to serve as very efficient grasping organs. The dentition is heterodont, the teeth consisting of incisors, canines, molars and prémolars-all clearly differentiated. Most Primates are essentially herbivorous, feeding on leaves, flowers and fruit, but many of them, such as the Macaques and Baboons are omnivorous. This order is divided into three main groups or suborders-the

Lemuroidea, the Tarsiodea and the Anthropoidea or Pithecoidea, of which the Lemuroidea and the Anthropoidea alone are represented in India, and the few specimens of Primates exhibited in this gallery belong only to these two suborders.

SUBORDER LEMUROIDEA.

This suborder comprises the Lemurs and Lorisids, and is chiefly distinguished from the apes and monkeys included in the next suborder by the presence of a long-snouted, dog-like head, with a moist, naked area of skin round the nostrils. All the fingers have flat nails, except the second toe on each foot which bears a distinct claw. The group is represented in South India ' by the Slender Loris, belonging to the family Lorisidae.

Family LORISIDAE.

The members of this family have short or rudimentary index fingers. The tail is very short or absent. This family includes the Galagos and Pottos of Africa and the Lorises of India.

The Slender Loris (Loris tardigradus) (Fig. 39) is confined to South India and Ceylon. Its limbs are long and slender, the animal consequently presenting a lean and lanky appearance. It is shy, secretive and nocturnal in its habits, and is generally found alone, sometimes in pairs, inhabiting dense forests as well as open tree jungle, and often descending from the trees into bushes to feed. During the day it sleeps concealed among the foliage and starts searching for its prey at dusk. It is slow and deliberate in its movements and approaches its prey very stealthily, capturing them with a quick grab using both hands. It is omnivorous and feeds mainly on berries, insects, tree frogs, lizards, small birds and their eggs. Two races occur in South India, the specimens exhibited in this gallery belonging to the race lydekkerianus which is the dry zone form inhabiting the Eastern Ghats westwards to Mangalore and Mysore. The other race, Malabaricus, is the wet zone form confined to the Malabar District, Wynaad, South Coorg



FIG. 39-LORIS TARDIGRADUS LYDEKKERIANUS: THE SLENDER LORIS.

and Travancore. Three male specimens and two entire articulated skeletons of *Loris tardigradus lydekkerianus* are exhibited.

SUBORDER PITHECOIDEA.

This suborder was formerly named Anthropoidea. There is no moist area of skin round the nostrils (rhinarium) and the lip is not closely adherent to the gum. The second digit in the foot is never differentiated from the rest by its claw-like nail. The majority of the Primates, including man, man-like apes and monkeys are included in this suborder. The monkeys of Asia and

Africa belong to the Section Cynomorpha which comprises two families, the Cercopithecidae and the Colobidae, both of which are represented in South India, and the man-like apes belong to the Section Anthropomorpha, of which (apart, of course, from man, forming the family Hominidae), only the family Hylobatidae comprising the Gibbons, occurs within Indian limits.

SECTION CYNOMORPHA.

(Monkeys)

Family CERCOPITHECIDAE.

This family includes the Baboons and Mangabeys of Africa and the Macaques which are mainly confined to Southern and Eastern Asia. Two species of Macaques occur commonly in Southern India, and these are represented in this gallery, although one other North Indian species, the Rhesus Macaque, also extends in its distribution as far south as the Godavari. In the species of this family cheek-pouches are present and the stomach is simple and undivided.

The Bonnet Monkey (*Macaca radiata*) (Fig. 40) is the commonest species of monkey found in Southern India. It is distinguished by a distinct bonnet of long, dark hairs radiating in all directions from a whorl on the crown of its head. It is found in



FIG. 40-MACACA RADIATA : THE BONNET MONKEY.

jungles as well as in villages and populous towns. It is more \cdot arboreal in habit than most other species of Macaques. It is often

found gregariously in troupes numbering as many as twenty or thirty individuals. It feeds on fruits, berries, leaves, shoots and also on insects, grubs, etc., and frequently raids fruit and grain shops. It also causes considerable damage to plantations and orchards. A female specimen from Madras and a skull are exhibited.

The Lion-tailed Macaque (*Macaca silenus*, formerly better known by its synonymous name, *Macaca ferox*) (Fig. 41) is distinguished from all other species of Macaques by the presence of



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FIG. 41-MACACA SILENUS; THE LION-TAILED MACAQUE.

a large mane of dark grey or brownish grey hairs and by its coat of thick, glossy black hair. It is confined to the Western Ghats from Kanara southwards to Travancore and Cochin. It is found in the denser and more remote forests in the higher elevations of the Western Ghats. It is shy and secretive in its habits, but like the other Macaques it is gregarious and lives in troupes of twelve or more individuals. As it frequents the most dense and lonely parts of the forest it is seldom seen. In captivity it is sulky and savage in its temperament. A single male specimen from Cochin and a skull are exhibited.

Family COLOBIDAE.

This family includes the monkeys commonly known as the Langurs, or Leaf Monkeys, the Proboscis Monkeys and the Sunbnosed Monkeys. Of these, the Langurs alone are represented within Indian limits. They are distinguished from the Macaques by their longer and narrower hands and feet, the absence of cheek pouches and by their complex, sacculated stomach. Several forms of Langurs—all of them subspecies of *Semnopithecus entellus*, and one species of *Kasi*, namely, *Kasi johnii*, the Nilgiri Langur, occur in South India. Of these, three of the commoner subspecies of
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Semnopithecus entellus and Kasi johnii are represented in this gallery.

The Common Indian Langur (Semnopithecus entellus) is recognized by its long, rather slender limbs, long tail and black face. They are found practically throughout the whole of India from the Himalayas to the Cape Comorin and Ceylon. About fourteen distinct races are recognised. Langurs are more markedly arboreal in habit than the Macaques, but some species inhabit rocky ground. They are generally found in the vicinity of water. They inhabit forests and shady groves, especially around tanks and temples, and are often found in and around towns and villages. They are purely herbivorous, feeding on fruits, leaves and tender shoots, and usually go about in troupes, sometimes proving very destructive to gardens and cultivated fields. Each troupe has a definite roost. They sleep in a sitting posture at the tips of the branches of trees as a precaution against the leopards and other beasts of prey. They move about on the tree tops with amazing agility, making long leaps and bounds from branch to branch with great precision. They are gregarious, moving about in large troupes, and there is often a promiscuous assemblage of males and females accompanied by their immature young ones which are carried about by their mothers.

The Hanuman Langur (Semnopithecus entellus anchises) (Fig. 42) occurs in the Madhya-Pradesh, Kurnool in the Eastern



FIG. 42—GROUP OF LANGURS: SEMNOPITHECUS ENTELLUS ANCHISES: THE HANUMAN LANGUR (PAIR ON THE LEFT) AND SEMNOPITHECUS ENTELLUS PRIAM: THE MADRAS LANGUR (PAIR ON THE RIGHT)

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Ghats and as far south as the Krishna River in the Andhra Pradesh. It is distinguished from the typical Indian race, *entellus*, by its paler hands and feet. A male and a female specimen (the male being mounted in the standing posture and the female in the seated) from Kistna District, are exhibited.

The Madras Langur (Semnopithecus entellus priam) (Fig. 42) inhabits the Coromandel Coast from Nellore southwards to Trivandrum and the Nilgiri Hills up to an elevation of about 6,000 feet. It has been specifically recorded from Dharmapuri, Shevroy and Palkonda Hills. It is distinguished readily from the other races by the presence of a distinct, erect, longitudinal crest of hair on the crown of the head, behind the frontal whorl of hair. Two specimens, a male and a female (the male being mounted in the seated posture and the female in the standing) are exhibited. They were obtained from Wynaad in 1918.

The Malabar Langur (Semmopithecus entellus dussumieri) (Fig. 43) is confined to the evergreen forests of the Malabar Coast. It also frequents gardens and the belt of cultivated woodland extending along the sea coast of South Kanara and Malabar. Though often found on trees near human habitations, it is shy and avoids observation. It is distinguished from the other related



FIG. 43-SEMNOPITHECUS ENTELLUS DUSSUMIERI : THE MALABAR LANGUR.

races by the much paler colour of the fur on its back which is greyish brown. A single female specimen is exhibited.

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The Nilgiri Langur (Kasi johnii) (Fig. 44) is a fairly heavily built, glossy black or blackish brown langur with a yellowish brown head. It inhabits the hill tracts of Southern India and is



FIG. 44---KASI JOHNII: THE NILGIBI LANGUR.

found especially on the Western Ghats from Coorg to Cape Comorin, the Nilgiris, Anamalai, Brahmagiri, Tirunelveli and Pulney Hills, usually at elevations ranging from 3,000 to 6,000 feet. It lives in dense woods of the evergreen forest and moves about in small groups of about five to ten individuals. It may occasionally enter gardens and cultivated fields. It is shy and wary and avoids the vicinity of man. It feeds mainly in the mornings and evenings, resting during the greater part of the day. It makes a loud, guttural, hooting noise. Its fur is fine and glossy and its flesh is supposed to be of medicinal value. A single male specimen is exhibited.

SECTION ANTHROPOMORPHA.

(Man-Like Apes)

Family HYLOBATIDAE.

This family includes the Gibbons. They were once regarded as Anthropoids and grouped with Chimpanzees and Gorillas, but are now classified as a distinct family. They have unusually long arms and fingers so that the arm span may be over 75 inches. The hind legs are short and there is no externally visible tail. The face is naked and the head small and rounded, without bony ridges. Two species of the Gibbon (Hylobates) are recorded, of which only one, Hylobates hoolock, is found within Indian limits, and is represented in this gallery by a single specimen. The White-browed Gibbon or the Hoolock Gibbon (Hylobates hoolock) (Fig. 45) is the only anthropoid ape found in India. The brow of white hairs in its black face is conspicuous and is very



FIG. 45-HYLOBATES HOOLOCK : THE WHITE-BROWED GIBBON.

characteristic of this species. Its arms are much larger than the legs. The males and young females are black, but mature females are yellowish grey. It inhabits the hill forests of Assam and Chittagong, but its distribution also extends into Burma and the Northern Shan States. Usually it lives in family parties composed of about six individuals. It hunts in the mornings and evenings, retiring to rest to the lower and more shady retreats of the forest during the hotter hours of the day. It feeds on fruits, leaves and also on insects, grubs and spiders. It is very agile in its movements among the trees, swinging from branch to branch with its long arms with astonishing speed. It can also walk and run in an erect posture on the ground. The newly born young are covered with yellow-tinted greyish white hair. A single female specimen, recently acquired, is exhibited.