FAUNA

FERÆ NATURÆ

Nothing less than a separate treatise, and that a voluminous one, could do justice to the marvellous wealth of the animal kingdom in a province under the tropics marked by so many varied natural features as Mysore. An attempt has been made to present a list of the main representatives, with the Kannaḍa names, where they could be ascertained. A few notes on the localities frequented by particular animals will be found in Vol. II.

Mammals—Mammalia.[1]

Primates.

Cercopithecidæ—Monkeys—*Kóti.*

Macacus silenus ...	Singalíka, karkóḍaga ...	The lion-tailed monkey
Macacus sinicus ...	Kóti, manga, kóḍaga ...	The common monkey of the country
Semnopithecus entellus	Musu, musuva, musuku[2]...	The langur, or Hanuman monkey
Semnopithecus priamus	Konḍa-musuku, konḍa-mosava	The Madras langur
Semnopithecus johni...	... ...	The Nilgiri langur

Lemuridæ—Lemurs.

Loris gracilis ...	Nala, aḍavi manushya ...	The slender loris

Carnivora.

Felidæ—Cat tribe—*Bekku.*

Felis tigris	Huli, heb-huli	The tiger[3]
Felis pardus	Kiraba, ibbandi, doḍ-ibba	The leopard or panther,[4] commonly called cheeta
Felis bengalensis ...	Huli bekku, bottina bekku	The leopard cat
Felis chaus	Káḍu bekku	The wild or jungle cat
Cynælurus jubata ...	Chirite, sivangi, chircha ...	The hunting leopard, the proper cheeta

[1] The classification and names are taken from W. T. Blanford's work on the *Fauna of British India*, and the vernacular names have been revised.

[2] It seems doubtful if this monkey is found in the South, and the names may belong to S. priamus.

[3] There are said to be two varieties,—the *heb-huli*, or large royal tiger, found in the large jungle; and the *huli*, which is much smaller and is more destructive to human life, frequenting inhabited parts of the country. It has the black stripes closer together over the hind quarters.

[4] The black variety is occasionally met with.

Viverridæ—Civets.

Viverricula malaccensis	Punagina bekku, javádi bekku	The civet cat
Paradoxurus niger ...	Kira bekku, kabbu bekku	The tree cat or toddy cat
Herpestes mungo ...	Munguli, mungasi, kira .	The mungoose
Herpestes smithi ...	... ...	The ruddy mungoose

Hyænidæ—Hyænas—*Kirabu.*

Hyæna striata ...	Kirabu, katte kiraba ...	The striped hyæna

Canidæ—Dog tribe—*Náyi.*

Canis pallipes... ...	Tóḷa	The Indian wolf
Canis aureus	Nari, ballu, guḷḷa nari ...	The jackal
Cyon deccanensis ...	Sil náyi	The Indian wild dog
Vulpes bengalensis ...	Kempu nari, channangi nari	The Indian fox

Mustelidæ—Weasels.

Mellivora indica	... ...	The Indian ratel
Lutra vulgaris ...	Nír-náyi	The common otter

Ursidæ—Bears—*Karaḍi.*

Melursus ursinus ...	Karaḍi	The Indian bear

Insectivora.

Soricidæ—Shrews—*Sunḍ ili.*[1]

Crocidura cærulea ...	Sunḍ ili, sonḍ ili ...	The musk rat or shrew
Crocidura perroteti	Múg-ili	Pigmy rat or shrew

Chiroptera.

Pteropodidæ—Frugivorous bats—*Bával.*

Pteropis edwardsi ...	Togal bávali, toval or tóle hakki	The Indian fruit bat or flying fox
Cynopterus marginatus	... ...	The short-nosed fruit bat

Rhinolophidæ—Insectivorous bats—*Kaṇ-kappaṭe.*

Rhinolophus luctus ...	... ...	The great horse-shoe bat
Rhinolophus affinis ...	... ...	The allied horse-shoe bat
Hipposiderus speoris...	... ...	Schneider's leaf-nosed bat
Hipposiderus bicolor...	... ...	The bicoloured leaf-nosed bat

Nycteridæ.

Megaderma lyra ...	... ...	The Indian vampire bat

Vespertilionidæ.

Vesperugo mordax ...	... ...	The grizzled bat
Vesperugo circumdatus	... ...	The black bat
Vesperugo abramus ...	gabbiláyi	The Indian pipistrelle
Vesperugo kuhli ...	... ...	The white-bordered bat
Nyctecegus dormeri ...	... ...	Dormer's bat
Nyctecegus kuhli ...	... ...	The common yellow bat

Emballonuridæ.

Taphozous melanopogon	... ...	The black-bearded sheath-tailed bat
Taphozous longimanus	... ...	The long-armed sheath-tailed bat
Taphozous saccolæncus	... ...	The pouch-bearing sheath-tailed bat

[1] Properly *sunḍil ili.*

Rodentia.

Sciuridæ—Squirrels—*Uḍute.*

Pteromys oral...	Háruva bekku	The brown flying squirrel
Sciurus indicus	Kes-aḷilu, kemp-aḷilu, kend-aḷilu	The large Indian squirrel
Sciurus macrurus	... ...	The grizzled Indian squirrel
Sciurus palmarum	Alilu, aṇilu, uḍute ...	The common striped squirrel
Sciurus tristriatus	Káḍ-aḷilu...	The jungle striped squirrel

Muridæ—Rats and mice—*Ili.*

Gerbillus indicus	Bila ili	The Indian gerbille, or antelope rat
Mus rattus	Ili	The common Indian rat
Mus decumanus	Kemp ili....	The brown rat
Mus musculus...	Chiṭṭ ili	The common house-mouse
Mus buduga ..	Bail ili	The Indian field-mouse
Mus platythrix	Kal ili	The brown spiny mouse
Mus mettada ...	Tóḍa	The soft-furred field-rat
Nesocia bengalensis	Bail ili	The Indian mole-rat
Nesocia bandicota	Heggana...	The bandicoot rat
Golunda elliotti	Golandi	The Indian bush-rat (the coffee-rat)

Hystricidæ—Porcupines—*Muḷ-handi.*

Hystrix leucura	Muḷ-handi, edu, eyya ...	The porcupine

Leporidæ—Hares—*Mola.*

Lepus nigrocollis	Moḷa	The black-naped hare

Ungulata.

Elephantidæ—Elephants—*A'ne.*

Elephas maximus	A'ne	The Indian elephant

Bovidæ—Ox tribe—*Yettu, basava.*

Bos gaurus	Káḍ kóṇa, káṭe ...	The bison, or gaur
Hemitragus hylocrius[1]	Káḍ áḍu	The Nilgiri wild goat (ibex)
Boselaphus tragocamelus	Káḍ kudure	The nilgai, or blue bull

Antelopidæ—Antelopes—*Chigari.*

Tetraceros quadricornis	Koṇḍa-guri	The four-horned antelope
Antilope cervicupra ...	Chigari, hulle	The Indian antelope, or black buck
Gazella bennetti ...	S'ank hulle	The Indian gazelle, or ravine deer

Cervidæ—Deer tribe—*Jinke.*

Cervulus muntjac ...	Káḍ-kuri	The barking deer, or jungle sheep
Cervus unicolor ...	Kaḍave, kaḍa	The sámbar deer
Cervus axis	Sáraga, duppi	The spotted deer
Tragulus meminna ...	Kur-pandi	The Indian mouse-deer

Suidæ—Hogs—*Handi.*

Sus cristatus	Káḍ handi	The Indian wild boar

Edentata.

Manidæ—Ant-eaters.

Manis pentadactyla ...	Chip handi	The Indian pangolin.

[1] There is some doubt whether ibex and nilgai are actually found in Mysore, but they are met with on the borders.

The most destructive to life are tigers, and panthers or cheetas. The following figures for the years 1890 to 1892 show the extent of loss, and what has been done to counteract the ravages of the larger animals, so far as the matter has come under official notice.

In 1889-90, there were four persons killed by tigers, two by panthers, and six by other animals; while of cattle, 1,150 were killed by tigers, 2,246 by panthers, 7 by bears, 2,695 by wolves, 362 by hyænas, and 225 by other animals.

In 1890-1, there were one person killed by an elephant, two by tigers, one by a bear, and four by other animals; of cattle, tigers killed 1,263, panthers 2,554, bears 49, wolves 1,823, hyænas 109, and other animals 289.

In 1891-2, there were one person killed by an elephant, one by a panther, three by hyænas, and nine by other animals; of cattle, 2,055 were killed by tigers, 3,621 by panthers, 2,439 by wolves, 242 by hyænas, and 375 by other animals.

The regular rewards offered for the destruction of wild beasts are Rs. 40 for a tiger or panther, and up to Rs. 10 for a hyæna. Elephants are too valuable to be destroyed, but a special reward is sometimes offered for the destruction of a rogue elephant that has become dangerous to life.

The amounts paid in rewards in the above years were as follows:—

Rs. 3,728 in 1889–90, namely, Rs. 1,416 for 40 tigers, Rs. 2,164 for 124 panthers, Rs. 12 for 4 hyænas, and Rs. 136 for 587 other animals.

Rs. 3,573 in 1890–1, namely, Rs. 1,453 for 39 tigers, Rs. 1,946 for 115 panthers, Rs. 18 for 4 hyænas, and Rs. 156 for 700 other animals.

Rs. 4,194 in 1891–2, namely, Rs. 100 for 1 elephant, Rs. 1,528 for 48 tigers, Rs. 2,303 for 148 panthers, Rs. 15 for 3 hyænas, and Rs. 248 for 1,389 other animals, including wild pig, rabid dogs, etc.

A comparison of these statistics with those for 1874 and 1875, given in the first edition, indicates a decrease on the whole in the deaths of human beings from wild beasts, but an increase in those of cattle. The former may be due either to an actual diminution in the number of wild beasts or to better means being now available for the treatment of wounded persons: the latter may be due to more complete returns. The figures relating to animals for whose destruction rewards were given, point to a decrease in the number of larger animals destroyed and an increase in that of smaller and commoner ones.

The necessity for a Game Law has been pressed upon the Government by both planters and sportsmen, principally to prevent the indiscriminate destruction of useful species. A draft Regulation has accordingly been framed and is under consideration, but it is not

intended to create a monopoly in animals in a state of nature for the benefit whether of Government or of sportsmen. In the term "Game" it includes antelope, ibex, jungle-sheep, sambhar and all other descriptions of deer, bison, hares, jungle-fowl, spur-fowl, pea-fowl, partridge, quail, snipe, woodcock, bustard, florican, duck and teal, with such other animals or birds as may be added. The pursuit or killing may be prohibited of any other animals or birds whose destruction may be considered unsportsmanlike. The killing, capture, and pursuit in large numbers of any particular kinds of wild animals or birds for the sake of their skins or plumage for commercial purposes will be restricted by a system of licenses, or prohibited altogether either for a certain time or within a certain area. Fishing in any stream or lake will in like manner be controlled, together with the poisoning of the water, the use of explosive or deleterious substances therein, and the capture of fish by fixed engines and nets of a mesh below a certain size. A season in the year may be fixed in any local area for the killing or capture of game or fish; or it may be prohibited altogether in any local area for five years; or absolutely as regards mature females or young of either sex of any descriptions of game. An exception is made in the case of an owner or occupier of land, who may kill, capture or pursue, within the limits of his land, game doing damage to any growing crop.

Elephants are too valuable to be destroyed, and a special license is required to kill one, which is only permitted when an animal endangers human life or proves destructive to the crops. At the same time the Keddah department was (1873) formed for the capture of elephants. Previous to this the animals were sometimes caught in pits. The pits were about twenty feet deep, and covered with a light network of bamboos, over which was spread a covering of leaves and earth. The earth dug out was carried to some distance. These pits never succeeded during the first year, but in the second year, when they had become overgrown with grass, the elephants were often deceived by them. When an elephant was caught, rubbish was thrown into the pit, which he trod down and gradually formed a path to the top. He was then seized by the tame elephants, without whose aid it would be impossible to secure a full-grown wild elephant, and at the same time ropes were thrown over him by the Kurubas. An elephant who was less than eight months old, when thus snared, could seldom be reared in captivity, and a tusker of any size had never been entrapped. In a graphic description of the rude manner in which the pitfall system was managed, Mr. G. P. Sanderson says:—"The atrocious cruelties to which elephants were subjected by it are too horrible to think of."

The Keddah department, established by him, was highly successful in its first operations, which resulted in the capture of fifty-five elephants in June 1874. Only nine died, and a profit of Rs. 22,000 was made on the affair. The site of the keddahs was near the Biligirirangan hills in Chamrajnagar taluq, and Mr. Sanderson's account of what was at that time a novel adventure was given in the first edition.[1] Shortly afterwards he was transferred to Dacca in Bengal for elephant-catching in the Chittagong and Garo hills, where he was equally successful. On his return to Mysore, in June 1876, the great famine was setting in, and instead of catching elephants he was engaged in forming grazing blocks in the border forests for the starving cattle that flocked thither for pasture. Meanwhile the keddahs in Mysore remained in abeyance, and Mr. Sanderson, after a furlough, was again employed in Bengal. But capture by pitfalls was resorted to in 1886, under proper direction, in the Kákankóte and Begur forests, and the District Forest Officer got fifty-two elephants there in this manner in the next five years, when the system was absolutely stopped on the extension of keddahs to that part. Of those caught thirty-five survived, and a profit of Rs. 15,000 was made on the whole. Still, during the periods that the keddahs had been unused, elephants multiplied and became so daring as to ravage crops even close to towns. Mr. Sanderson's services were therefore again applied for, and in 1889 he was placed at the disposal of Mysore for five and a half years. To facilitate operations, twelve trained Kumki elephants were purchased from the Pheelkhana at Dacca, and seventeen more were imported from Burma in 1890. These twenty-nine cost over a lakh. With the exception of a few that died, they have become acclimatized to Mysore, and are in a healthy and serviceable condition.

In a fortnight from Mr. Sanderson's arrival, in July 1889, he captured a herd of fifty-one in the old keddahs constructed by him in 1877. Intimation was then received of the proposed visit of H.R.H. Prince Albert Victor, and it was desired to make a second catch, if possible, for his entertainment in November. The interesting account of how the capture of thirty-seven elephants was effected on that occasion has been contributed by Mr. Sanderson to Mr. Rees' book.[2] Keddahs were next formed near Kákankóte in 1890, and an extensive use of the telephone was introduced by Mr. Sanderson, for rapid communication from his base camp with the watch-houses at the keddah gates and various points in the jungles, the whole being connected with

[1] A full description of this and other operations will be found in his book called "Thirteen Years among the Wild Beasts of India."

[2] "The Duke of Clarence and Avondale in Southern India," chap. iv.

the telegraph station at Hunsur, whence messages could be sent all over India. Altogether, in two drives in 1889–90, and three drives in 1890-1, there were 159 elephants caught, and the greater number were sold at Nanjangud, Palghat, and Tellicherry. Excluding the large initial outlay for Kumki elephants and trained hands from the north, with special charges connected with the Royal visit, the expenditure was fairly covered by the receipts, while the stockades, with live and dead stock, remained for future use at a moderate cost for up-keep. In 1891-2 there were two drives, resulting in the capture of seventy-five elephants. Sales were effected at Paschimavâhini and at Haidarabad in addition to the places before mentioned. That the expenditure was much in excess of the receipts was greatly owing to cost of additional telephone materials and instruments. In May, 1892, Mr. Sanderson died. Since then Mr. K. Shamiengar, for a short time his assistant, has been in charge of the keddahs. In two drives in 1892-3[1] and two drives in 1893-4 he was successful in capturing 120 elephants, of which twenty-one died. The disposal of the remainder still left a deficit on the department of about Rs. 22,000. But the network of telephones has been so skilfully laid, both in the Kákankóte and Chamrajnagar forests, as practically to ensure the ultimate capture of every elephant that passes within certain limits, and the expenses will be recouped.

Elephants have of late years become troublesome in the Shimoga and Kadur Districts, destroying sugar-cane and paddy crops, and injuring the areca-nut gardens. Attempts to stop them by shooting some were made, but proved ineffectual. The Keddah department are therefore endeavouring to capture some of the herds, which are small and scattered, in temporary stockades.[2] The effect of the inroads of elephants has been to drive the field-watchers to the trees, and this has left an opening for wild pig to do more mischief to the crops than before, when the watchers were on the spot to scare them away.

Crops are also liable to considerable damage at times from rats. In the latter months of 1878 something like a plague of rats appeared, especially in the Chitaldroog District, and committed great havoc in the cotton and rice crops of individual villages. Certain kinds of field rat regularly store up a good deal of grain in their burrows near the embankments of fields, which Woddars and various wandering tribes dig up when the ground is out of cultivation and help themselves to the grain.

[1] At the end of 1892 the Viceroy, the Marquess of Lansdowne, witnessed the drive.

[2] A capture of sixty elephants near Sakrebail has now (November, 1894) been announced.

No one who has travelled much over the Province, especially in the wilder and more secluded tracts of country, but must have noted the immense variety and beauty of the feathered tribes. The naturalist and the sportsman alike will, it is hoped, find every familiar acquaintance included in the following list.[1] It may perhaps be noted that the ostrich has laid eggs and hatched young in the Maharaja's menagerie at Mysore, but they did not live long.

Aves—*Hakki.*

Passeres.

Corvidæ—Crows—*Káki, Kági.*

Corvus macrorhynchus	Jungle crow
Corvus splendens	Indian house-crow
Dendrocetta rufa	Indian tree-pie
Parus atriceps ...	Indian grey tit
Parus nuchalis ...	White-winged black tit
Machlolophus haplonotus	Southern yellow tit

Crateropodidæ.

Argya caudata ...	Common babbler
Argya malcolmi...	Large grey babbler
Argya subrufa ...	Large rufous babbler
Crateropus canorus	Jungle babbler
Crateropus griseus	White-headed babbler
Pomatorhinus horsfieldi	Southern scimitar babbler
Dumetia albigularis	Small white-throated babbler
Pyctorhis sinensis	Yellow-eyed babbler
Pellorneum ruficeps	Spotted babbler
Rhopocichla atriceps	Black-headed babbler
Myophoreus horsfieldi	Malabar whistling thrush
Larvivora brunnea	Indian blue chat
Brachypteryx rufiventris	Rufous - bellied short-wing
Zosterops palpebrosa	Indian white-eye
Ægithina tiphia...	Common iora
Chloropsis jerdoni	Jerdon's chloropsis
Irena puella ...	Fairy blue-bird
Hypsipetes ganeesa	South-Indian black bulbul
Molpastes hæmorrhous	Madras red-vented bulbul
Otocompsa fuscicaudata	Southern red-whiskered bulbul
Pycnonotus gularis	Ruby - throated bulbul
Pycnonotus luteolus	White - browed bulbul
Micropus phæocephalus	Grey-headed bulbul

Sittidæ—Nuthatches.

Sitta castaneiventris	Chestnut - bellied nuthatch
Sitta frontalis ...	Violet-fronted blue nuthatch

Dicruridæ—Drongos.

Dicrurus ater ...	Black drongo (king-crow)
Dicrurus longicaudatus	Indian ashy drongo
Dicrurus cærulescens	White - bellied drongo
Chaptia ænea ...	Bronzed drongo
Chibia hottentotta	Hair-crested drongo
Dissemurus paradiseus	Larger rocket-tailed drongo

Sylviidæ—Warblers.

Acrocephalus stentoreus	Indian great reed-warbler
Acrocephalus dumetorum	Blyth's reed-warbler

[1] Taken from the volumes on Birds by E. W. Oates, in the *Fauna of British India.*

Acrocephalus agricola	Paddy-field reed-warbler
Cisticola erythrocephala	Red-headed fantail-warbler
Cisticola cursitans	Rufous fantail-warbler
Franklinia gracilis	Franklin's wren-warbler
Franklinia buchanani	Rufous-fronted wren-warbler
Schœnicola platyura	Broad-tailed grass-warbler
Chætornis locustelloides	Bristled grass-warbler
Arundinax aëdon	Thick-billed warbler
Hypolais rama ...	Sykes's tree-warbler
Sylvia jerdoni ...	Eastern orphean warbler
Sylvia affinis ...	Indian lesser white-throated warbler
Phylloscopus affinis	Tickell's willow-warbler
Acanthopneuste nitidus	Green willow-warbler
Acanthopneuste viridanus	Greenish willow-warbler
Acanthopneuste magnirostris	Large-billed willow-warbler
Prinia socialis ...	Ashy wren-warbler
Prinia inornata ...	Indian wren-warbler
Prinia jerdoni ...	Southern wren-warbler

Laniidæ—Shrikes—*Kukkati*.

Lanius vittatus ...	Bay-backed shrike
Lanius erythronotus	Rufous-backed shrike
Lanius cristatus ...	Brown shrike
Hemipus picatus	Black-backed pied shrike
Tephrodornis sylvicola	Malabar wood-shrike
Tephrodornis pondicerianus	Common wood-shrike
Pericrocotus flammeus	Orange minivet
Pericrocotus peregrinus	Small minivet
Pericrocotus erythropygius	White-bellied minivet
Campophaga sykesi	Black-headed cuckoo-shrike
Graucalus macii...	Large cuckoo-shrike
Artamus fuscus ...	Ashy swallow-shrike

Oriolidæ—Orioles.

Oriolus kundoo ...	Indian oriole
Oriolus melanocephalus	Indian black-headed oriole

Eulabetidæ—Grackles or talking-mynas.

Eulabus religiosa	Southern grackle

Sturnidæ—Starlings and mynas.

Pastor roseus ...	Rose-coloured starling
Sturnia blythii ...	Blyth's myna
Temenuchus pagodarum	Black-headed myna
Acridotheres tristis	Common myna
Æthiopsar fuscus	Jungle myna

Muscicapidæ—Flycatchers.

Siphia parva ...	European red-breasted fly-catcher
Cyornis pallidipes	White-bellied blue flycatcher
Cyornis rubeculoides	Blue-throated fly-catcher
Cyornis tickelli ...	Tickell's blue fly-catcher
Stoparola melanops	Verditer flycatcher
Alseonax latirostris	Brown flycatcher
Alseonax ruficaudus	Rufous-tailed fly-catcher
Ochromela nigrirufa	Black-and-orange flycatcher
Culicicopa ceylonensis	Grey-headed fly-catcher
Terpsiphone paradisi	Indian paradise fly-catcher
Hypothymis azurea	Indian black-naped flycatcher
Rhipidura albifrontata	White-browed fantail flycatcher

Turdidæ—Chats, Robins, Thrushes, &c.

Pratincola caprata	Common pied bush-chat
Pratincola maura	Indian bush-chat
Ruticilla rufiventris	Indian redstart
Thamnobia fulicata	Black-backed Indian robin
Copsychus saularis	Magpie robin
Merula nigripileus	Black-capped blackbird
Geocichla wardi...	Pied ground-thrush

Geocichla cyanotus	White - throated ground-thrush
Petrophila cinclorhyncha	Blue-headed rock-thrush
Petrophila cyanus	Western blue rock-thrush

Ploceidæ—Weaver-birds.

Ploceus baya ...	Baya
Ploceus manyar ...	Striated weaver-bird
Munia malacca ...	Black-headed munia
Uroloncha striata	White-backed munia
Uroloncha malabarica	White - throated munia
Uroloncha punctulata	Spotted munia
Sporægnithus amandava	Indian red munia

Fringillidæ—Finches.

Carpodacus erythrinus	Common rose-finch
Gymnorhis flavicollis	Yellow - throated sparrow
Passer domesticus	House-sparrow
Emberiza luteola...	Red-headed bunting

Hirundinidæ—Swallows.

Chelidon urbica ...	Martin
Ptyonoprogne rupestris	Crag-martin
Ptyonoprogne concolor	Dusky crag-martin
Hirundo rustica ...	Swallow
Hirundo smithii ...	Wire-tailed swallow
Hirundo fluvicola	Indian cliff-swallow
Hirundo nepalensis	Hodgson's striated swallow
Hirundo erythropygia	Sykes's striated swallow

Motacillidæ—Wagtails and Pipits.

Motacilla maderaspatensis	Large pied wagtail
Motacilla melanope	Grey wagtail
Motacilla borealis	Grey-headed wagtail
Limonidromus indicus	Forest wagtail
Anthus maculatus	Indian tree-pipit
Anthus striolatus	Blyth's pipit
Anthus rufulus ...	Indian pipit

Alaudidæ—Larks.

Alauda gulgula ...	Indian sky-lark
Mirafra cantillans	Singing bush-lark
Mirafra affinis ...	Madras bush-lark
Galerita deva ...	Sykes's crested lark
Ammomanes phœnicura	Rufous-tailed finch-lark
Pyrrhulauda grisea	Ashy - crowned finch-lark

Nectariniidæ—Sun-birds.

Arachnechthra lotenia	Loten's sun-bird
Arachnechthra asiatica	Purple sun-bird
Arachnechthra minima	Small sun-bird
Arachnechthra zeylonica	Purple-rumped sun-bird
Arachnothera longirostris	Little spider-hunter

Dicæidæ—Flower-peckers.

Dicæum erythrorhynchus	Tickell's flower-pecker
Piprisoma squalidum	Thick-billed flower-pecker

Pittidæ—Pittas.

Pitta brachyura ...	Indian pitta

As Mr. Oates' work stops here, the remainder is taken from J. A. Murray's *Indian Birds* or the *Avifauna of British India*. But, from the two works not being arranged on the same system, I have endeavoured to give the information from the latter in the order in which it is presumed it will appear in the former when completed.

Macrochires.

Cypselidæ—Swifts.

Cypselus melba ...	Alpine swift
Cypselus affinis ...	Common Indian swift
Cypselus batassiensis	Palm swift
Hirundinapus indicus	Indian giant spine-tail
Hirundinapus sylvatica	White - rumped spine-tail
Collocalia unicolor	Indian edible-nest swiftlet
Dendrochelidon coronatus	Indian crested tree-swift

Caprimulgidæ—Goat-suckers.

Caprimulgus mahrattensis	Sykes's night-jar
Caprimulgus monticolus	Franklin's night-jar
Caprimulgus atripennis	Ghaut night-jar
Caprimulgus indicus	Jungle night-jar
Caprimulgus kelaarti	Nilgiri night-jar

Pici.

Picidæ—Woodpeckers—*Mara-kuṭaka.*

Yunx torquilla ...	Common wryneck
Tiga jaranensis ...	Common large three-toed woodpecker
Brachypternus aurantias	Golden-backed woodpecker
Brachypternus chrysonotus	Lesser golden-backed woodpecker
Micropternus gularis	South-Indian rufous pecker
Gecinus striolatus	Blyth's striated green woodpecker
Thriponax hodgsoni	Great black woodpecker
Chrysocolaptes festivus	Black-backed woodpecker
Picus mahrattensis	Yellow-fronted pied woodpecker
Iyngificus hardwickii	Southern pigmy woodpecker

Coccyges.

Cuculidæ—Cuckoos—*Kógila.*

Cuculus striatus ...	Asiatic cuckoo
Cuculus sonneratii	Banded cuckoo
Hierococcyx varius	Common hawk cuckoo
Cacomantis nigra	Indian plaintive cuckoo
Coccystes jacobinus	Pied-crested cuckoo
Coccystes coromandus	Red-winged crested cuckoo
Eudynamys honorata	Indian koel
Rhopodytes viridirostris	Small green-billed malkoha
Centrococcyx rufipennis	Common crow pheasant
Centrococcyx bengalensis	Lesser coucal
Taccocua leschenaulti	Southern sirkeer

Capitonidæ—Barbets.

Megalæma caniceps	Common green barbet
Megalæma viridis	Small green barbet
Xantholæma hæmacephala	Crimson-breasted barbet
Xantholæma malabarica	Crimson-throated barbet

Upupidæ—Hoopoes.

Upupa epops ...	Hoopoe

Meropidæ—Bee-eaters.

Merops viridis ...	Common Indian green bee-eater
Merops phillipinus	Blue-tailed bee-eater
Merops leschenaulti	Chestnut-headed bee-eater
Nyctiornis athertoni	Blue-necked bee-eater

Coraciadæ—Rollers.

Coracias indica ...	Indian roller

Alcedinidæ—Kingfishers.

Alcedo bengalensis	Little Indian kingfisher
Ceryle rudis ...	Pied kingfisher
Halcyon smyrnensis	White-breasted kingfisher
Ceyx tridactyla ...	Three-toed kingfisher
Pelargopsis gurial	Indian stork-billed kingfisher

Bucerotidæ—Hornbills.

Dichoceros bicornis	Great pied hornbill
Anthracoceros coronatus	Malabar pied hornbill
Ocyceros birostris	Common grey hornbill

Psittaci.

Psittacidæ—Parrots—*Giṇi.*

Loriculus vernalis	Indian loriquet
Palæornis torquatus	Rose-ringed paroquet
Palæornis rosa ...	Western rose-headed paroquet

Striges.

Bubonidæ—Eagle and Scops Owls.

Bubo bengalensis	Rock horned owl
Bubo nipalensis ...	Forest eagle owl
Scops pennatus ...	Indian scops owl
Scops malabaricus	Malabar scops owl
Carine brama ...	Spotted owlet
Ninox scutulata ...	Brown hawk owl
Glaucidium radiatum	Jungle owlet
Glaucidium malabaricum	Malabar owlet
Asio accipitrinus...	Stout-eared owl
Syrnium ocellatum	Mottled wood-owl
Syrnium indrance	Southern wood-owl

Strigidæ—Owls—*Gúbe, gúge.*

Strix flammea ...	Indian screech-owl
Strix candida ...	Grass-owl

Accipitres.

Vulturidæ—Vultures—*Haddu.*

Gyps indicus ...	Long-billed vulture
Pseudogyps bengalensis — rana haddu	Common brown vulture
Otogyps calvus ...	Black vulture

Falconidæ—Falcons—*ḍége.*

Circus pygargus ...	Montague's harrier
Circus macrurus...	Pale harrier
Circus æruginosus	Marsh harrier
Astur trivirgatus...	Crested goshawk
Astur badius ...	Brown hawk
Accipiter nisus—bannada ḍége	European sparrow-hawk
Accipiter virgatus —ur-chitlu	Besra sparrow-hawk
Buteo ferox ...	Long-legged buzzard
Aquila heliaca ...	Imperial eagle
Aquila vindhiana	Tawny eagle
Aquila clanga ...	Spotted eagle
Nisætus fasciatus	Crestless hawk-eagle
Nisætus pennatus	Dwarf or booted eagle
Neopus malayensis	Black eagle
Spizætus nipalensis	Spotted hawk-eagle
Spizætus cirrhatus —juṭṭu bhairi	Crested hawk-eagle
Circætus gallicus	Common serpent-eagle
Spilornis melanotis	Southern harrier-eagle
Butastur teesa ...	White-eyed buzzard
Haliastur indus—garuda	Maroon-backed kite (Brahmini kite)
Milvus govinda ...	Common Indian kite
Milvus melanotis	Large Indian kite
Pernis ptilonorhynchus	Honey buzzard
Baza lophotes ...	Black-crested kite
Microhierax cærulescens	White-naped pigmy falcon
Falco communis—bhaira	Peregrine falcon
Falco peregrinator —ḍége	Shaheen falcon
Falco juggur — giḍaga	Lugger falcon
Falco chiquera ...	Red-headed merlin
Hierofalco saker...	Cherrug falcon
Polioaetui ichthyaetus	Eastern white-tailed eagle

Steganopodes.

Pelecanidæ—Pelicans.

Pelecanus roseus...	Eastern white pelican
Phalacrocorax pygmœus	Little cormorant
Plotus melanogaster	Indian snake-bird

Herodiones.

Ciconidæ—Storks—*Baka.*

Leptopilus javanicus	Lesser adjutant
Xenorhynchus asiaticus	Black-necked stork
Ciconia leucocephala	White-necked stork

Ardeidæ—Herons—*Kokkare.*

Ardea cinerea ...	Common heron
Ardea purpurea...	Blue heron
Herodias alba ...	Large white heron
Herodias garzetta	Little black-billed white heron
Bubulcus coromandus	Cattle egret

Ardeola grayi ...	Pond heron, paddy bird
Butorides javanica	Little green bittern
Ardetta flavicollis	Blue bittern
Ardetta cinnamomea	Chestnut bittern
Ardetta sinensis...	Little yellow bittern
Botaurus stellaris	Common European bittern
Nyctorax griseus...	Night heron

Tantalidæ.

Tantalus leucocephalus	Pelican ibis
Platalea leucorodia	Spoonbill
Threskiornis melanocephalus	White ibis

Anseres.

Anatidæ—Ducks—*Bátu.*

Sarkidiornis melanonotus	Comb duck
Nettapus coromandelianus	Cotton teal
Dendrocygna javanica	Lesser whistling-teal
Casarca rutila ...	Brahmini duck
Spatula clypeata...	Shoveller
Dafila acuta ...	Pintail
Querquedula crecca	Common teal
Fuligula cristata...	Tufted pochard

Podicipidæ—Grebes.

Podiceps minor ...	Dab-chick

Columbæ.

Treronidæ—Fruit Pigeons.

Crocopus chlorigaster	Southern green pigeon
Osmotreron malabarica	Malabar green pigeon
Carpophaga ænea	Imperial green pigeon
Carpophaga insignis	Bronze-back imperial pigeon

Columbidæ—Pigeons and Doves—*Párivála.*

Columba intermedia	Indian blue rock-pigeon
Turtur meena ...	Rufous turtle-dove
Turtur senegalensis	Little brown dove
Turtur risorius ...	Indian ring-dove

Gallinæ.

Pteroclidæ—Sand grouse.

Pterocles fasciatus	Painted sand grouse

Phasianidæ—Peafowl—*Navilu.*

Pavo cristatus ...	Common peacock

Megapodidæ.

Gallus ferrugineus	Common jungle-fowl
Gallus sonnerati ...	Grey jungle-fowl
Galloperdix spadiceus	Red spur-fowl
Galloperdix lunulatus	Painted spur-fowl

Tetraonidæ.

Francolinus pictus	Painted partridge
Ortygornis ponticeriana	Common grey partridge
Perdicula asiatica	Jungle bush quail
Perdicula argoondah	Rock bush quail
Microperdix erythrorhyncha	Red-billed bush quail
Coturnix communis	Large grey quail

Tinamidæ.

Turnix plumbipes	Indo-Malayan bustard quail

Geranomorphæ.

Otitidæ—Bustards and floricans.

Sypheotides auritus	Lesser florikin

Cursoridæ—Courier plovers.

Cursorius coromandelicus	Indian courier plover
Charadrius fulvus	Eastern golden plover
Lobivanellus indicus	Red-wattled lapwing
Sarciophorus bilobus	Yellow-wattled lapwing
Œdicnemus crepitans	Stone plover

Gruidæ—Cranes—*Kahva.*

Grus cinerea ...	Common crane
Anthropoides virgo	Demoiselle crane

Limicolæ.

Scolopacidæ.

Scolopax rusticola...	Woodcock
Gallinago nemoricola	Wood snipe
Gallinago scolopacina	Common snipe
Gallinago gallinula...	Jack snipe
Machetes pugnax ...	Ruff
Actitis ochropus ...	Green sand-piper
Totanus glareola ...	Wood sand-piper
Totanus calidris	Red shank
Recurvirostra avocetta	Avocet
Himantopus candidus	Stilt

Rallidæ—Rails.

Porphyrio poliocephalus	Purple coot
Fulica atra ...	Bald coot
Porzana bailloni ...	Pigmy rail
Porzana maruetta ...	Spotted crake
Gallinula chloropus ...	Moorhen
Gallinula phœnicura ...	White-breasted water-hen

Gaviæ.

Laridæ.

Sterna melanogastra	Black-bellied tern
Rhynchops albicollis	Indian skimmer

The remaining orders—Tubinares and Pygopodes—I have not succeeded in identifying. Perhaps some of the entries under Coccyges should come here.

Reptiles.

"The few crocodiles that are found in the Mysore rivers very rarely attack people (says Mr. Sanderson[1]); and fishermen, who pay no heed to them, have told me that if they come upon a crocodile whilst following their employment, it will skulk at the bottom and not move though handled, apparently believing it escapes observation."

The loss of life from snake-bite may be gathered from the following particulars:—In 1889-90 there were 97 human beings and 32 cattle killed by snakes; in 1890-1 the numbers were 77 and 8; in 1891-2 they were 109 and 31. The amounts paid in these three years as rewards for the destruction of venomous snakes were Rs. 678 for 2,579, Rs. 690 for 2,589, and Rs. 664 for 2,873 respectively. So far as the figures go, the loss of life, as compared with what was reported in the first edition fifteen years ago, is certainly diminished, and this may possibly be the result of the improved sanitary arrangements in towns and villages, whereby much of the rubbish around dwelling-houses which formerly gave cover to snakes is now regularly cleared away.

Reptilia.[2]

Emydosauria—Crocodiles.

Crocodilidæ—Crocodiles—*Mosale.*

Gavialus gangeticus ... ... Crocodilus palustris

Chelonia—Tortoises and Turtles.

Trionychidæ—Tortoises—*A'me.*

Trionyx leithii

Testudinidæ.

Testudo elegans	Hál áme...	Nicoria trijuga	... Muriki áme

[1] "Thirteen Years among the Wild Beasts of India," p. 14.

[2] Compiled from the volume by G. A. Boulenger in the *Fauna of British India.*

Squamata—Lizards and Snakes.

Geckonidæ—Geckos—*Oti, óti-káṭa.*

Gymnodactylus nebulosus		Hemidactylus frenatus	
Gymnodactylus deccanensis...		Hemidactylus gleadovii	Halli
Gonatodes mysoriensis		Hemidactylus maculatus	
Gonatodes gracilis		Hemidactylus triedrus	
Hemidactylus reticulatus		Hemidactylus costæi	Halli

Eublepharidæ.

Enblepharis hardwickii

Agamidæ.

Sitana ponticeriana		Calotes ellioti	
Calotes versicolor ... O'ti		Charasia dorsalis	

Varanidæ—Lizards—*Halli.*

Varanus bengalensis... U'saravalli

Lacertidæ.

Cabrita leschenaultii... ... ... Ophiops jerdonii

Scincidæ—Skinks—*Háva ráṇi.*

Mabina carinata		Lygosoma albopunctatum	
Mabina macularia		Lygosoma punctatum	

Chamæleontidæ—Chameleons—*Gósumbe.*

Chamæleon calcaratus

(Ophidia)

Typhlopidæ—Worm-like snakes.

Typhlops braminus ... ... Typhlops acutus

Boidæ—Pythons or boas.

Python molurus ... Dásara hávu

Gongylophis conicus... ... ... Eryx johnii[1]

Uropeltidæ—Earth snakes.

Rhinophis sanguineus		Silybura phipsonii	
Silybura ellioti		Pseudoplectrurus canaricus	

Colubridæ—Snakes—*Hávu.*

Xylophis perroteti		Tropidonotus piscator .	Nír hávu
Lycodon striatus		Tropidonotus plumbicolor	Hasur hávu
Lycodon aulicus		Helicops schistosus	
Hydrophobus nympha		Dipsas trigonata	
Ablabes calamaria		Dryophis perroteti	
Simotes arnensis		Dryophis mycterizans	Hasur núlige
Oligodon venustus			
Oligodon subgriseus...		Hypsirhina enhydris ...	Nír hávu
Zamenis mucosus[2] ... Kére		Callophis nigrescens	
Zamenis fasciolatus		Bungarus fasciatus	
Coluber helena		Bungarus cæruleus[3] ...	Gódi nágara
Dendrophis pictus		Naia tripudians[4] ...	Nágara hávu
Tropidonotus stolatus		Naia bungarus	

Viperidæ—Vipers.

Vipera russellii ... Kolaku-mandala Echis carinata... ... Kallu hávu

[1] The so-called two-headed snake. [2] Rat snake or whip snake (*dhámin* in Hindi).
[3] Known as the krait. [4] The cobra or cobra de capello.

Batrachia.

Ranidæ—Frogs—*Kappe.*

Rana hexadactyla	Rana limnocharis
Rana cyanophlyctis[1]... ...	Rana breviceps
Rana tigrina	Rana beddomii

Engystomatidæ.

Microhyla ornata	Callula variegata
Callula pulchra	Cacopus systema

Bufonidæ—Toads.

Bufo melanostictus

FISHES.

"The rivers and artificial lakes in Mysore abound with excellent fish, but I have never succeeded in getting much sport with the fly (writes Mr. Sanderson).[2] They may be taken by spinning or ground fishing—the latter chiefly at night. There is now in the Museum at Bangalore the head and skin of a fish—a species of carp or *mahseer*, and called *bili* or silver-fish in Canarese—caught by me in 1871 in the Lakshmantirtha, which measured sixty inches in length and thirty-eight in girth. The circumference inside the mouth when caught was twenty-four inches. I was unfortunately unable to weigh this fish, but I estimated it by rough tests at not less than 100 lbs. I have seen much larger fish, without doubt upwards of 150 lbs., caught by natives, chiefly by netting during the months when the rivers are low. At such times two or three villages of professional fishermen will combine to net a single large fish known to be a prisoner in a pool during the hot weather. The pool may be a hundred yards long and broad, and the water fifteen feet deep, with cavernous rocks capable of sheltering fish; but by joining their nets, and diving and working for two or three days, they seldom fail to secure the prize."

The following list has been compiled from Dr. Day's book.[3] A number of native names of fish, not identified, will be found under each District in Vol. II.

Pisces—*Mínu.*

Teleostei.

Siluridæ—Cat-fishes.

Clarias magur ...	Marave—Black catfish
Saccobranchus fossilis	Chélu mínu—Yellow catfish, scorpion fish
Wallago attu	Vale, ole

Callichrous bimaculatus[4]	Godale
Pseudentropius atherinoides	Bále .. Ladyfish
Macrones vittatus[5]	Geralu
Macrones keletius	
Rita hastata	

[1] (?) The chunam or flying frog. [2] *Op. cit.* [3] In the "Fauna of British India."

[4] *Puffta* in Hindustani: called the "butter-fish" by Europeans in Bengal.

[5] Dr. Day has the following note:—"This fish is termed 'the fiddler' in Mysore;

Cyprinidæ—Carps.

Lepidocephalichthys thermalis	
Nemachilus guentheri	
Nemachilus semiarmatus	
Nemachilus denisonii	
Nemachilus beavani	
Discognathus lamta	Pandipakke (korafi kaoli, Hind.)
Labeo fimbriatus	
Labeo calbassu ...	Kari mínu
Labeo kontius	
Cirrhina cirrhosa	
Cirrhina reba	
Matsya argentea	
Barbus chagunio	
Barbus sarana ...	Gid pakke
Barbus chrysopoma	
Barbus micropogon	
Barbus carnaticus	Gid pakke (Giddi kaoli, Hind.)
Barbus tor[1]	
Barbus carmuca	
Barbus melanampyx	
Barbus parrah ...	(Kacha korava, Hind.)
Barbus dorsalis ...	Mar pakke
Barbus kolus	
Barbus melanostigma	
Barbus puckelli	
Barbus arulius ...	aruli
Barbus ticto ...	(Kaoli, Hind.)
Barbus vittatus	
Chela argentea	White carp
Chela boopis	
Chela clupeoides	

Percidæ—Perches.

Ambassis nama	
Ambassis ranga	

Nandidæ.

Badis buchanani	
Badis dario	
Nandus marmoratus	
Pristolepis marginata	
Pristolepis malabarica	

Gobiidæ.

Gobius giurus ...	Abbroni

Rhynchobdellidæ.

Mastacembalus armatus	Thorny-backed

Ophiocephalidæ.

Ophiocephalus marulius	Hurvina maral
Ophiocephalus leucopunctatus	Bili korava
Ophiocephalus striatus	Kuchina maral
Ophiocephalus guchua	Mar korava
Ophiocephalus punctatus	Bálu, béli korava

Insects.

Of the countless hosts and varieties of the insect world, no pretension can be made to give anything like a detailed list. The leading families alone are indicated. Of spiders, beetles, and the singular mantis tribe, there is a great profusion; as also of the gayest butterflies and richest moths. The bee (except in parts of the Malnád) is never domesticated, but large quantities of honey are obtained by jungle tribes from the woods and caves of various parts. White ants swarm in every soil, and their ravages are relentless. On one or two evenings following on the first heavy showers of the monsoon, which

I touched one which was on the wet ground, at which it appeared to become very irate, erecting its dorsal fin and making a noise resembling the buzzing of a bee, evidently a sign of anger. When I put some small carp into an aquarium containing one of these fishes it rushed at a small example, seized it by the middle of its back, and shook it like a dog killing a rat; at this time the barbels of the *Macrones* were stiffened out laterally like a cat's whiskers."

[1] The mahseer of sportsmen.

have softened the parched and dried-up ground, their winged nymphs issue in gauzy clouds to enjoy a brief flight; and then, losing their wings, which strew the whole surface of the ground, crawl about in the form of maggots, a prey to every bird of the air and every creeping lizard. They are also gathered and cooked for food by the lower orders. The tiny mango-flies or eye-flies, which swarm during the hours of sunlight, especially in the mango season, are a well-known source of annoyance. To them is attributed a kind of ophthalmia, termed "sore eyes," to which children especially are subject; but whether the flies originate the affection or merely convey the contagious matter from eye to eye is doubtful. Among insect pests the coffee-borer has already been mentioned (p. 168). At the beginning of 1878 a new danger appeared in vast flights of locusts, which threatened to destroy the first early crops that succeeded the great famine. But, fortunately, the damage they did was far less than the most sanguine could have expected.[1]

Annelida—*Suctoria.*

Hirudinidæ ..	jigaṇi ...	Leeches ...	Abound at the Gersoppa Falls and in all forests during the wet season.

Arachnida.

Araneidæ Lycosidæ Mygalidæ	... jáḍa ...	Spiders ...	Very numerous and of great variety.
Scorpionidæ	chéḷu ...	Scorpions ...	There are three species; the large black rock-scorpion (*maṇḍragabbe*), the large red field scorpion, and the little red house scorpion. The sting is very rarely fatal, but often causes great pain for a time.
Acaridæ ...	... ...	Mites	
Sarcoptes scabiei	kajji huḷa	Itch acarus	This loathsome affection is very common, even among the upper classes of natives.
Ixodidæ ...	uṇṇe ...	Ticks	

[1] A flight of locusts which passed over Mandya on the evening of the 16th of May, 1800, is thus described by Buchanan:—"It extended in length probably about three miles; its width was about a hundred yards, and its height fifty feet. The insects passed from west to east in the direction of the wind, at the rate of six or seven miles an hour. The whole ground, and every tree and bush, was covered with them, but each individual halted for a very short time on any one spot. In an hour after the flock had passed few were to be discovered in the neighbourhood of the town. The noise of this immense number of insects somewhat resembled the sound of a cataract. At a distance they appeared like a long, narrow, red cloud near the horizon, which was continually varying its shape. The locusts were as large as a man's finger, and of a reddish colour." A flight the previous year had eaten up all the young Jola: the present flight settled at a village to the eastward of Mandya, and did the same.

Myriapoda.

Iulidæ.			
Iulus indus ...	bandi basava		Very common.
Scolopendridæ ..	jari ...	Centipedes	There are several species, differing in size and colour; the largest is of a greyish colour with crimson legs; of the smaller kinds, one is black and another of a sandy or ashy colour.
Polydesmidæ			

Insecta.

Anoplura.			
Pediculus	hénu ...	Louse ...	Every one must be familiar with the sight of native women removing this unpleasant occupant from one another's hair. The same operation may be constantly witnessed among the common monkeys.
Hemiptera.			
Scutellera			
Phlæa			
Cimex	tigaṇi	Bug	
Neides			
Cicada			
Fulgora	minchu huḷa	Firefly	
Aphis			These are of great variety and beauty on different kinds of trees.
Coccus		Cochineal insect	
C. lacca ...	aruga ...	Lac insect	
Kermes		Gall insect	
Orthoptera.			
Mantis religiosa		Praying mantis	There are numerous species, of various sizes and colours; some appear to have the power of changing colour like a chameleon.
Phasma		Animated straw	
Phyllium		Leaf-like insects	Several of these are of great beauty and curiosity. One is an exact counterpart of the mango leaf.
Gryllus	jille	Crickets ...	Very numerous and various. The stridulation of the tree cricket and the mole cricket are at times, in certain localities, almost deafening.
Locusta ...	patanga, miḍite ..	Grasshoppers	
Acridium ...	miḍite, ṭoppu ...	Locusts ...	These insects are here comparatively harmless.
Blatta ...	jirle	Cockroaches	

Neuroptera.

Libellula ...	túni huḷa	Dragon fly	
Ephemera			
Myrmeleon	... ...	Ant lion ...	. . Very common.
Termes ...	geddalu	White ants	... Universal: their nest or ant-hill is called *hutta*: the winged nymphs, which issue in swarms in the rains, are called *ichalu huḷa.*

Aphaniptera.

Pulex irritans	chikaṭa	Common flea	

Diptera.

Culex ...	gungaru	Gnat	
Tipula ...	... .	.. ...	... Daddy longlegs.
Culex ...	soḷḷe	Mosquito...	... A well-known pest.
Musca ...	noṇa	Fly ...	... All varieties.
		Mango fly or eye fly	Very numerous at Bangalore in the mango season. It is no bigger than a flea.

Lepidoptera.

Rhopalocera	chitte, kapate,[1] pátragitte,[2] sítádevi huḷa	Butterflies	... A very great variety:—Nymphalidæ, 34 species: Lycænidæ, 28 species;[3] Papilionidæ, 16 species.[4]
Heterocera	nusi	Moths	
Bombyx mori	réshmi huḷa	The caterpillar is the silkworm.	

Hymenoptera.

Ichneumon			
Formica ...	iruve	Ants	... Abound in every part in great variety.
Vespa ...	kaṇajada huḷa ...	Wasp and hornet	
Apis ...	jénu huḷa .	Honey bee	
Xylocarpa	jirangi	Carpenter bee	
Bombus	... ...	Bumble bee	

Coleoptera.

Scarabæus	dumbe	Beetles ..	... Beetles abound in great profusion, and of much beauty of form and colouring.
Buprestis ...	hasar dumbe ...	Green beetles ..	The wings are used for the decoration of slippers, &c.
Carabus			
Copris ...	... ...	Dung beetle	... Very common on every road.

[1] The plain or sober-coloured ones. [2] Those with gay and variegated colours.
[3] From Marshall and de Nicéville's work *The Butterflies of India* (no more published). [4] From Donovan.

Of *insects useful to man* the most important are the silk-producing worms, the lac and cochineal insects, and bees.

Silkworm.—The fatality which attended the rearing of silkworms for some years, and checked an industry that was a source of livelihood to large numbers of Muhammadans, is noticed in Vol. II.; together with the efforts that were made at the time, though ineffectually, to re-establish a healthy race of insects, more especially by Signor de Vecchj, in connection with a Silk Filature Company at Kengeri, Bangalore District. The industry has now revived and is again flourishing, owing to the comparative immunity of the worms from disease. Silk is produced in all the taluqs of the Bangalore District, as well as in Chik Ballapur and Tirumakudal Narsipur taluqs.

Tasar Silkworm.—The domestication of the tasar silkworm was advocated some years ago, as the cocoons have been found in the jungles around Nandidroog and Devaráydroog. The following notes on the subject are taken from Captain Coussmaker's reports at the time:

There are four ways in which the tasár silk cocoons may be procured, all of which I myself have successfully tried. Firstly:—During the hot weather, when the leaf is off; then the cocoons are easily discernible hanging like berries from the twigs; men might then go into the jungles and collect them. Secondly:—From June to October the caterpillars are large and commit much ravage on the trees. Their presence then is easily detected by the denuded appearance of the twigs, and by their droppings under the tree (the large caterpillars do not wander at all, but eat steadily along one twig, devouring leaf after leaf); men might then go and collect them all on to one tree, beneath which they themselves might build a hut and live, scaring away birds, squirrels, &c. Both of these methods are practised in the Bengal Presidency. Thirdly:—The moths can be paired when they issue from the cocoons, and the caterpillars reared from the eggs. Fourthly:—When the moths issue from the cocoons, the females can be tied up to certain trees and the males liberated there, when, if any of these latter be not in full vigour, wild males may come and pair with the females, which can then be removed.

In hatching out and rearing the caterpillars there is no difficulty; twigs of whatever tree is most convenient to use should be put into earthen pots full of earth and water, the mouths of which should, as recommended by Captain Hutton, be closed with cotton rammed in, to keep the twigs steady and to prevent the caterpillars crawling down into the water and drowning themselves. For the first fifteen days, during which the caterpillars wander about much, the pots should be kept each in a small wooden frame, the opposite sides of which should be covered with mosquito net or fine bamboo chicks, so that the light and air may penetrate freely and the worms not escape. After that time the pots should be put upon shelves or tables with

the twigs interlacing so as to form a long hedge, and left uncovered. The caterpillars should be kept there until they change their skins for the last time, when they may be put on to twigs suspended over bamboos hung from the ceiling; and here they will spin their cocoons, which may be gathered every day when the twigs are renewed. In all cases the twigs should be changed every day—those that are old and stripped, thrown away; those that the caterpillars are on, should be put near the fresh twigs, and they will crawl off of their own accord. It is advisable to water them two or three times a day from a watering-pot with a very fine rose; give them a gentle shower as it were: this is refreshing both to caterpillars and twigs. I have noticed that in changing their skins, it sometimes happens that the old skin does not come off freely. I think that a moderate amount of moisture is essential to their well-doing. In this way, with the least possible trouble and expense, any amount of these caterpillars can be reared; ordinary precautions being taken to protect them from their numerous enemies, by stopping rat-holes, sweeping away cobwebs, nailing wire netting or bamboo chicks over the windows, which should be kept open by night and day.

I am glad to see that Mr. Massa reports so favourably upon the specimens of tasar silk cloth. I myself am greatly indebted to Mr. R. S. De Souza, the jailor at Dharwar, at whose suggestion the twilled variety was wove, and it was through his ready assistance and careful supervision that the specimens were obtained.

Experiments have also been made with the Eri silkworm from Assam, which feeds on the leaves of the castor-oil plant; and with a variety of gold-lace cocoons found in the jungles of Hassan.

Cochineal.—The introduction of the cochineal insect was proposed as a partial remedy for the failure of the silk industry. Regarding it the following extract is taken from a memorandum by Colonel Boddam:—

One hundred years ago the Hon'ble Court of Directors attempted to introduce cochineal culture into India, and offered a reward of £2,000 to any one successfully importing it. In 1795 a naval officer secretly imported some cochineal insects from Brazil, which were distributed over India, and cultivation fostered by the Court of Directors. After expending two lakhs of rupees it was discovered that the wrong insect had been got. There are two sorts of cochineal insect—the *silvestre* or wild one, and the *grana-fina* or domesticated one; the latter only producing the cochineal of commerce. It unfortunately was the *silvestre* that had been imported, and was not worth the trouble of cultivating. The *grana-fina* has never been successfully imported. Besides getting the true insect, the proper cactus for its support is necessary; the common *opuntia ficus indica*, or prickly-pear, will not suit the domesticated kind. It must be *opuntia cochinellifera* or *opuntia tuna*. Referring to Kew as to the correct cactus, authorities differed. After much correspondence this point was settled, and I got the true *cactus cochinellifera*, compared the plants so named growing at the Botanical Gardens in Calcutta,

Madras and Bangalore, and found them identical, corresponding with the description of cactus at Teneriffe.

After reviewing all that has been done, the writer in Watt's Dictionary says:—"The first and most natural step towards the introduction into India of a commercial industry in cochineal should be the thorough investigation of the races of cocoons already existing in the country and the plants on which they feed."

Lac Insect.—The lac insect is found in several parts, as near the Nandi hills. The tree on which it feeds is the *jálári* (*shorea talura, Roxb.*) All the trees, says Buchanan, are small, not exceeding eight or ten feet in height; and their growth is kept down by the insect and its managers; for this size answers best. The tree, left to itself, grows to a large size and is good timber. For feeding the insect, it thrives very well in a dry barren soil; and is not planted, but allowed to spring up spontaneously as nature directs. In Kártika, or from about the middle of October to the middle of November, the *lac* is ripe. At that time it surrounds almost every small branch of the tree, and destroys almost every leaf. The branches intended for sale are then cut off, spread out on mats, and dried in the shade. A tree or two that are fullest of the insects are preserved to propagate the breed; and of those a small branch is tied to every tree in the month Chaitra, or from about the middle of March to the middle of April; at which time the trees again shoot out young branches and leaves. The *lac* dried on the sticks is sold to the merchants. This is what is called *stick-lac*, which, after the dye has been extracted, is formed into *seed* and *shell-lac*.

Bees.—The bees are described by Buchanan as of four kinds. That from which most of the honey and wax is procured is called *hej-jénu-huḷa*. This is a large bee, which builds under projections of the rocks or in caverns. A large nest gives eight seers of honey = 4·85 lb., and three seers of wax = 1·82 lb. A small hive gives about one-third of this quantity. The honey is gathered twice a year, in A'sháḍha and Mágha, or in the month following the summer solstice and the second after that of winter. Some people of the Bedar caste make the collecting of honey and wax a profession, and it is one attended with much danger. Having discovered a hive, some of them kindle a fire under the rock, and throw on it the leaves of the *cassia fistula* and of the *puleseri*, which emit a smoke so acrid that nothing ! ving can endure it. The bees are forced to retire; and some others of the Bedar, so soon as the smoke subsides, lower down by a rope one of their companions, who with a pole knocks off the nest and is immediately drawn up again;

for if he made any delay the bees would return, and their stinging is so violent that it endangers life. In order to fortify him against the sharp points of rocks, and against injury from the rope which passes round his chest, the adventurous Béda is secured before and behind by several folds of leather.

The bee that produces the next greatest quantity of honey is called the *kaḍḍi* or *chiṭṭu-jénu-huḷa* ; that is, stick or small honey. This bee is very small, and builds around the branch of a tree a comb of an oblong shape and sharpened at both ends. It is found at all seasons, but is in the greatest perfection at the same time with the other. The honey is of the finest quality; but the whole comb seldom weighs more than two seers, or 1·2lb. This bee does not sting, and is readily driven away by a twig switched round the comb.

The *tuḍuve* is a bee of which the honey is of an excellent quality, but rarely procured; for it generally builds deep in the crevices of rocks, where it is totally inaccessible. Sometimes, however, it is found in hollow trees, and one hive will give from twenty to twenty-five seers of honey, or about twelve or fifteen pounds; but the quantity of wax is in proportion small. This is a large bee; but it very seldom stings those who plunder its hive.

The *toriga* is a very small bee, that seldom stings. It takes possession of the deserted nests of the white ants, which in this country are very numerous in the wastes of red soil such as is usually cultivated for rági. Of this stiff earth the white ants raise hills resembling the stump of a tree, which are from four to six feet high, very hard, and able long to resist the heaviest rain. These, when deserted, most commonly become the lurking-places of snakes; but sometimes give shelter to the *toriga* bee. Its nest is therefore easily accessible; but it is very small, and contains only about a seer of honey and half a seer of wax.

DOMESTIC ANIMALS.

Horses.—The only native breed of horses is, as in most parts of India, an ill-shaped, vicious *taṭṭu*; as a rule not exceeding twelve hands in height.[1] In spite of the pains which Haidar and Tipu took to improve the Mysore breed by importation, even their far-famed cavalry were as a rule badly mounted. The former Silahdár horses, sprung generally from Arab sires and Mahratta dams, were probably fair specimens of the class of animal which supplied the Muhammadan armies. These were extremely weedy and deficient in barrel, but would stand a great deal of work. A few stallions have always been maintained by Government; but the Silahdárs generally used to purchase their horses from private breeders, and their demand was the sole incentive to breeding. Of late years a hardy race of ponies has come into use for drawing the small two-wheeled conveyance called a *jutka*, which does duty for a native cab. The ponies are doubtless of Mahratta breed, and capable of great endurance. To improve the general breed of horses six superior stallions were obtained in 1889 from the Military Department and stationed at headquarters of Districts. The following year four fresh stallions and a pony mare were procured and the remaining Districts supplied. But so far the demand for their services has been rather limited.

A horse-breeding establishment is kept up by Government at Kunigal (removed there many years ago from Closepet) for supplying the Silahdárs with suitable mounts. In 1886 there were seven Arab stallions and one Australian; in 1891 the Arab stallions had risen to eight in number, and the Australian to three. During the intervening five years 271 foals were bred at the Stud, and, including stock of previous years, 246 were passed into the ranks. In addition to these, seventy were cast and sold as unfit or undersized, sixty-two died, and three were destroyed. The number remaining on hand in the Stud Farm in 1891 was 154.

Mules.—It is said that Tipu Sultan introduced some fine asses from Arabia for the purpose of breeding mules; but the prejudices of his subjects were so strong that nothing could be done. A private scheme

[1] Writing in 1803, Colonel Welsh says:—"Colar is so famous for a breed of vicious horses that all over the peninsula, whenever a horse turns out ill, he is called Colarie."

for a regular system of breeding these useful animals, so invaluable for transport, has been lately put before the Mysore Government for assistance, but nothing definite has so far been decided on.

Asses.—Every washerman keeps three or four females and a male. The superfluous males are sold to various kinds of petty traders, and people who transport salt and grain. The breed is very small, no pains being taken to improve it; nor indeed to keep it from growing worse. Some are of the usual ash-colour, whilst others are almost black, in which case the cross on their shoulder disappears. These are not varieties as to species; for black individuals have sometimes ash-coloured colts, and, on the contrary, black colts are sometimes produced by ash-coloured dams. The asses get nothing to eat except what in the intervals of labour they can pick up about the village. When the crop is on the ground they are tied up at night; but at other seasons they are allowed to roam about, and in order to prevent them from wandering too far their fore-feet are tied together. The males are never castrated, and the best are always sold off by the washermen, which are the principal causes of the degeneracy of the breed. At three years of age the females begin to breed, and some have every year a colt, while others breed once only in three years. An ass's burthen is reckoned about 76 lbs; with which they will daily travel about seven miles.

Horned Cattle.—The principal breeds of horned cattle in Mysore are the Amṛit Mahál, Mádésvaran Beṭṭa, the Kánkánhalli, and the village cattle. Almost all other cattle seen in the country are importations or crosses between the above-mentioned breeds.

The *Amṛit Mahál*,[1] literally Milk Department, is an establishment for the breeding of a race of cattle peculiar to the country of Mysore and famous for its utility for military purposes. The establishment was founded at some time during the Hindu government, with special privileges as regards grazing; but its maintenance for the special purpose of supplying draught cattle for artillery is due to Haidar Ali. He is reported to have introduced a breed of cattle from the Trichinopoly country, by a cross between which and the indigenous breed of Mysore was produced the Hallikar breed, which is considered the best in the whole establishment. Great doubt exists as to what the breed imported was, but general tradition points to the small Brahmani bulls, which to this day are noted for their endurance and fast trotting powers.

"It was this establishment," wrote Sir Mark Cubbon, "which enabled

[1] The particulars are taken from a pamphlet containing the history of the Amṛit Mahál, compiled from the Records of the Department by Captain M. A. Rowlandson, and one on Hunsur, by Dr. Gilchrist; with corrections by Major McInroy, the officer formerly in charge, to whom I was indebted for them.

Haidar Ali to march 100 miles in two days and a half to the relief of Chidambram, and after every defeat to draw off his guns in the face of his enemies; which enabled Tipu Sultan to cross the peninsula in one month for the recovery of Bednur, and to march sixty-three miles in two days before General Medows; which, in later times, enabled General Pritzler to march 346 miles in 25 days in pursuit of the Peshwa: and which enabled General Campbell, after the failure of his Bengal equipments, to advance upon Ava and bring the war to a favourable termination. It was also this establishment which enabled the Duke of Wellington to execute those movements of unexampled rapidity which are the admiration of every military man, and in consideration of whose services he recommended it to protection in a letter addressed at the close of the war to the Commander-in-Chief." Allusions in the Wellington Despatches show that the Great Duke often, during the Peninsular War in Spain, regretted that he had not the assistance of the Amṛit Mahál cattle.

After the capture of Seringapatam, the Breeding establishment was intrusted to the native government, and the Public Cattle department to an agent; but the inducements which had led Haidar and Tipu to keep up its efficiency were wanting, and by the end of 1813 the cattle had degenerated to such a degree that the management was taken over by the British, and 10,914 head of breeding cattle, the exact number made over to the Raja's government in 1800, received back. A Commissariat officer (Captain Harvey) was placed in charge, with a suitable establishment, and up to the 31st July, 1816, the number of cattle had increased to 14,399, exclusive of 900 calves transferred as fit for service. By 1823 the original number had nearly doubled itself, besides supplying for the public service young bullocks equal to one-fourth part of the increased establishment. In 1860, from motives of economy, Sir Charles Trevelyan ordered the establishment to be broken up, and the herds to be sold; but the results were to the detriment of the public service. The Amṛit Mahál was therefore, with the cordial approval and assistance of the then Maharaja, re-established in December 1867, with 5,935 head of cattle. In 1871 there were 9,800 head of all sizes, exclusive of 1,000 young male cattle in the Training Depôt. It was arranged that a certain number of bulls should be handed over to the Mysore Government annually, to be stationed at various points in the country for the purpose of improving the breed of cattle used by the ryots.

The cattle were divided into 30 herds, containing from 200 to 700 head of cattle each; for the grazing of which, 298 *kávals* or pasture grounds were allotted in various parts of the country.[1] They are divided into hot weather, wet weather and cold weather kávals, according to the seasons of the year during which they are of most use. The hot weather kávals are generally the beds of tanks in which grass springs up during the hot months, and near which there are trees for the purpose of affording shade to the cattle during

[1] Though a herd consists of both males and females of various ages, they are not allowed to graze in immediate company, each being divided into seven lots, called páls, to prevent their injuring one another. The average number of attendants or graziers is one to every fifty head of cattle.

the heat of the day. These are very valuable kávals, and are reserved as far as possible for the sole use of the Government cattle. The cold and wet weather kávals are those which during those seasons have plenty of grass and water, but which during the hot weather dry up and are of little use to the department; in both the latter descriptions of kávals the ryots' cattle are permitted to graze certain fixed portions, and after the Government cattle have left for their annual visit to the jungles, the *shervegárs* are permitted to sell some part of the grazing, and from the funds thus obtained the *kávalgárs* or guards are paid and other expenses met. This privilege ceases at the end of July each year.

The *Amrit Mahal* cattle comprise three varieties, called the Hallikár,[1] Hágalvádi and Chitaldroog, from the districts which originally produced them, and may be readily distinguished from every other breed in India by the peculiar shape and beauty of their heads and the symmetry of their form. They seldom attain an extraordinary height, but in proportion to their size are remarkably deep and wide in the chest, long and broad in the back, round in the barrel, well ribbed up and strong in the shoulder and limb.[2] They are active, fiery, and walk faster than troops; in a word, they seem to constitute a distinct species, and possess the same superiority over other bullocks, in every valuable quality, that thoroughbreds do over other horses. The cows of this breed are white, but the males have generally an admixture of blue over the fore and hind quarters. There is a fourth variety of coloured cattle, which are considered inferior to the white in energy and perseverance, though they rather surpass them in size. As the former breed is the most perfect that is known, it would only tend to its deterioration to cross it with any other, and the bulls are accordingly bred in the best herds, and individuals, selected from the best specimens, distributed to improve the breeds in the other herds.

A cow of this breed is supposed to give about one pucka seer of milk a day, and the calf could not be deprived of any part of it without

[1] An absurd legend is current among the herdsmen of the department regarding the origin of the *Hallikár*. They state that Haidar Ali, after one of his trips to the south, brought back to the Mysore country a number of cows of the small Brahmani caste. These cows were turned loose into a kával (in the Túmkúr District) in which there were great numbers of antelope, and a cross between the big black bucks and the small Brahmani cows gave the present Hallikár breed. In support of the story they point to the small spot below the eye, common to antelope and to Hallikár cattle.

[2] The general characters of a good bullock are a round barrel, stout strong legs, and broad forehead. The average height is 48 inches, and 50 inches was about the highest standard. But the average height has very much increased since the re-establishment of the department in 1866. Some of the bullocks now run up to 53½ inches. Of course weight is also a material consideration. The average is about 12 maunds or 43 stone, but no means have been adopted to determine this exactly.

being materially injured in its growth. The calves remain with their mothers during the day, but are separated from them at night, and are kept in a fold under charge of the herdsmen until they are three months old, when they begin to graze and get strength. In the cold season, when the herbage is abundant, they are generally weaned at the age of five months; but such as are brought forth later in the year cannot be separated from their mothers till after the hot weather. After separation, care is taken to conduct them to the richest pastures in the neighbourhood, and they are never supplied with any other food.

Heifers begin to breed between three and a half and four years old, and bring forth six or seven times. Twenty cows are allowed to one bull. The bulls begin to propagate at five years of age and retain their vigour till ten, when they are discarded from the herds. The average annual amount of births is fifty per cent on the number of cows, and the proportion of male and female calves is nearly equal.

The whole of the cattle, bulls, cows and calves subsist entirely on what the pastures afford, and on the stalks of the castor, *baller*, *kulti*, and other nourishing plants, which are left on the ground for their use after the harvest in the months of January, February and March. This brings them into excellent condition at the most favourable season for the cows taking the bull. In the dry weather, when a want of forage and water prevails in the open country, the herds are conducted to the south-western jungles, where the natural moisture of the soil, the early showers, and the shelter afforded by the trees are favourable to vegetation. They arrive there in May and return to their pastures in September, when the grass is in great abundance all over Mysore.

The calves are castrated in November, the cold weather being found peculiarly favourable to the success of the operation, and invariably between the age of five and twelve months, as their growth is supposed to be promoted by early castration; and it is attended with this important advantage, that it prevents the cows being impregnated by inferior bulls and consequently prevents the breed from degenerating. They are separated from the herds after four years of age and transferred to the Public Cattle Department when turned of five, perfectly trained and fit for work. They arrive at their full strength at seven and are past their vigour at twelve; they work till fourteen or fifteen, after which they decline rapidly and generally die at eighteen years of age. The cattle of these herds are kept in their wild state, without shelter of any description; they are very fiery and cannot be approached by strangers without the protection of the herdsmen. It requires several months to break them in, and the employment is extremely difficult and dangerous.

At the age of three years the catching of bullocks takes place, previous to which they are nearly as wild as the inhabitants of the jungle. The bullocks are first driven into a large oval enclosure, which they are made to enter with much difficulty. This communicates with a square yard, surrounding an inner enclosure about twenty feet square, which is surrounded with a strong fence made of wooden posts placed close together and about twelve feet high. When they are collected in this, the opening is closed. The trainers then ascend on the top of the fence, and throw a noose round each of the bullock's horns. This done, the end of the rope is passed between posts near the ground, and the animal is drawn close up and secured by people on the outside. The passage is then opened and old trained bullocks admitted. One of the latter is bound by the neck to one of the wild animals, which being done, the rope is loosened, when he immediately endeavours to escape. His trained comrade, however, to whom he is coupled, restrains him, though but partially; accordingly the two leave the enclosure at tolerable speed. The rope by which the untrained bullock was originally noosed is allowed to remain attached to his horns, and when they approach one of the strong posts placed in the immediate vicinity of the enclosure the rope is quickly turned round it, by which the animals are again brought up. The untrained bullock is then well secured by the neck, with as little latitude of motion as possible. There he is kept alone for about two days, until he becomes considerably tamed and worn out with unceasing efforts to escape. The next operation consists in attaching to the animal a couple of blocks of wood so heavy as to be moved with some difficulty, and giving him as much liberty as this admits of. He is then admitted to the company of old trained cattle, and from the twofold effects of example and partial restraint he gradually becomes submissive. The bullocks are now grazed in the vicinity of Hunsur for a further pe ɔd of three years, being tied up regularly each evening in lines. They ar then transferred to the Public Cattle Department to undergo final breaking for the public service.

Since the Rendition the following changes have taken place:—On the 1st January, 1882, the Mysore Government purchased the Amṛit Mahál cattle from the Madras Government, there being at that time 30 herds, with 12,502 head, of which 4,618 were cows and 177 breeding bulls. It was stipulated that the Department should supply the Madras Government for ten years with three-year-old bullocks at Rs. 50 per head, to a number not exceeding 400 annually. In 1886 this limit was reduced to 200 of four years old at the same price. The herds were therefore broken up in 1887 and their number reduced to sixteen. In 1889 steps were taken to form special herds of big and fine cattle. There are thus 23 herds now (1894) under six darogas. The steers are not caught near Hunsur, but in different kávals, and are accustomed to being tied up before being handed over to Madras. Others are sold at reduced rates or distributed to raiyats at suitable places. Each of the

darogas has also a sheep farm, where the country ewes are crossed by cross-bred Kashmir rams.

At the Hissar Cattle Farm in the Punjab, artillery cattle are bred from the Mysore cross to serve as "leaders." At the Bhadgaon Farm of the Bombay Government cattle-breeding has been established for over eleven years, the herd having taken its origin from the Mysore Amṛit Mahal. The main object has been to breed Mysore bulls for crossing and improving the cattle of the country around. "As I passed through the district, I saw evidence," writes Dr. Voelcker, "of the impress which the Mysore cattle reared at the Farm had made upon some of the other cattle, and how superior to the ordinary cattle were those which had the Mysore 'touch' in them."[1]

Mádésvaran Beṭṭa—This breed comes from the jungles and hills near Biligirirangan Beṭṭa, on the south-eastern frontier of Mysore. They are larger than the Amṛit Mahál cattle, but are loosely made and not well ribbed up. They have heavy loose-hanging dewlaps, sloping broad foreheads, and large muzzles. They are very heavy slow animals, but crossed with a Hallikár bull they form excellent cattle for draught and ploughing. Of this cross-breed are the cattle mostly used by the large cart owners who carry on trade from towns in the Mysore territory to the Western Coast, Bellary and other places.

Kánkánhalli.—This breed comes from Kánkánhalli, in the south-east of Mysore; they are very like the Mádesvaran Beṭṭa breed, but are generally smaller, though larger than the Amṛit Mahál breed. They have thick horns, broad sloping foreheads, and white, very thick skins. In all other respects the remarks regarding the Mádesvaran Beṭṭa breed are applicable to the Kánkánhalli.

The *village cattle* vary very much in size, colour and characteristics; in some parts very fair cattle may be seen, but as a general rule the village cattle are a stunted inferior race. The cows generally give from half to one seer of milk per diem, though occasionally some may be met which give three seers, but it will be generally found that these have been fed on nutritious food, such as oil-cake, cotton-seed and such like. The bullocks are small, but for their size do a surprising amount of work.

Buffalo.[2]—Of the buffalo there are three varieties, the *Hullu*, the *Gaujri* or Gujarat, and the *Chokatu*, which comes from the country bordering on the river Krishna.

The *Hullu* is by far the most common, and is the native breed of the country. The female has a calf every year, and gives milk for seven

[1] *Report on the Improvement of Indian Agriculture*, 204.

[2] Much of the information in the following paragraphs is from Buchanan.

months. Besides what the calf draws from her, she gives twice a day about a quart of milk. She generally bears from ten to twelve calves, and is very unruly when the keeper attempts to milk her without the calf being present. They will convey a greater weight, either in a cart or on their back, than a common ox; but walk very slowly, do not endure heat, and cannot easily travel more than seven miles a day.

The two stranger breeds are greatly superior in size to the *Hullu*; but in this country they very soon degenerate. The females breed once in two or three years only, and produce in all about six calves. For two years after each parturition they continue to give a large quantity of milk; but in the third year their milk begins to diminish; and it entirely ceases about two months before the time of calving. In this country, besides what the calf is allowed, they give daily from six to eight quarts of milk and require no more food than the common breed, neither do they refuse their milk should the calf be removed or die. The males are entirely reserved for breeding or for carrying loads; one of them will carry as much as six oxen, and will walk fas. :r.

Sheep.—These are of three varieties, the *Kurubar* or ordinary breed, so called from the caste which rears it; the *Gollar*, which is less common and which owes its name to the same cause; and the *Yeḷaga*, which is the rarest of the three. White, brown and black colours are found in all three breeds. The Kurubar is a small sheep, with horns curling backwards. Both its flesh and wool are superior to those of the other two varieties. The Gollar is distinguished from the Kurubar by its large size, coarser wool, longer neck and different formation as to the head and jaws. The Yeḷaga, which is rare, is longer in the leg, and stands higher than the other breeds, but is less bulky and more resembles a goat in structure of the body and limbs. The sheep of this variety are never shorn of their wool, being too coarse for manufacture, and they shed their coats once a year. This is the breed which is used for draught and carriage of children. The Gollar sheep are left out at night at all seasons and in all weathers, and do not appear to suffer from the exposure, while the Kurubars and Yeḷagas are invariably housed at night. The different breeds are never mixed, chiefly owing to antagonism between the Kurubar and Gollar castes; but even in the absence of enmity between the shepherds it is doubtful whether the two varieties could ever be brought to mix, and it is pretty well established that the Yeḷaga will not amalgamate with the other two. They are solely dependent on pasturage, being never fed on grain.

Sheep, with the exception of the Yeḷagas, are shorn twice a year, and fifty fleeces amount to about a maund weight. The wool is all coarse,

and is made into rough kamblis. The shepherds usually hand over 100 fleeces to the weaver, who gives them in return a kambli. There was formerly a Government manufactory at Húnsúr, which turned out good blankets made from the wool of the white sheep in the Government farm. This has been abolished.

"The woolly breed of sheep, which exists throughout Mysore, is fairly esteemed," says Dr. Shortt, "both for its mutton-forming and wool-producing qualities. The rams have large heavy horns, wrinkled and encircled outwards, and their points inwards and forwards. The head is large and heavy-looking, with a prominent Roman nose. The ears are of moderate size and pointed, and the tail short, never exceeding 3 to 4 inches. The ewes are mostly hornless. They are occasionally met with small light horns, seldom exceeding 3 to 4 inches in length. The prevailing colour is from a light to a very dark grey or black. The ram stands 25 inches, and the ewe 23 inches in height. The ordinary live weight is from 40 to 60 lbs., but gram-fed wethers attain from 60 to 80 lbs. They have fairly compact carcases, with good width, prominence and depth of chest; the body is well wooled and rectangularly formed; in picked specimens the counter is full and the shoulder is fairly filled when in condition. The fleece never exceeds 3 to 4 lbs., and the staple averages 3 to 4 inches in length. An ordinary sheep fetches from 2 to 3 rupees in the market, fat wethers 7 to 10 rupees each.

"This breed furnishes the chief fighting rams of Southern India, for which purpose good picked male rams are sought after by native Rajas, Zamindars and others. They are much petted and pampered, till they grow quite savage; they will butt and also strike with their fore-feet; and I have also seen in one or two instances a propensity to bite. They are pitted against each other, and large sums of money staked on the result. In fighting, they run a tilt by first moving backwards some short distance to add force to the impulse of their weight; and frequently in the fight they have their heads or horns broken. These rams, from special selection and good feed, often attain 30 inches in height and over 80 lbs. in weight. Size does not necessarily ensure success in the battle, as I have seen the largest ram of the kind I remember ever having met with, run away after a few tilts from one that was very much smaller. All the breeds of sheep in Southern India are pugnacious and reared to fight, the preference always being given to the black woolly breeds of Mysore or to those of Coimbatore. This breed extends from Mysore to Bellary, where after a time the wool frequently changes into long lank hair."

For many years Sir Mark Cubbon had an experimental sheep farm at

Heraganhalli, Nagamangala taluq, under the charge of a European Commissariat subordinate officer. Merino rams were imported yearly from Australia and the cross-breeds distributed all over the country. The breed of sheep throughout the Province was thus immensely improved both as to size, quality of mutton, and wool. The wool was sent in bales by the Mysore Government to England for sale, as well as for the purpose of being manufactured into blankets and serge. The farm was given up in 1863, as it did not pay expenses. This was owing apparently to sheep-breeding alone receiving attention: if other branches of farming had been combined, the results would probably have been more favourable.

In 1888 a flock of fifteen rams and ewes was imported from Australia with the view of improving the fleece of the country breed. A flock of white sheep and their lambs by an acclimatized merino ram had also been collected for breeding purposes. The lambs thus bred are larger and the fleece of the sheep much better than those of the ordinary sheep of the country. Some have been sent to Haidarabad and others sold or distributed to raiyats for breeding.

Goats.—There are two kinds of goats, the long-legged or *méke*, and the short-legged or *kanchi méke*, but the two can propagate together. In every flock of sheep there is commonly a proportion of 10 or 20 *méke* to 100 sheep. This does not interfere with the pasture of the sheep, for the goats live entirely on the leaves of bushes and trees. One male is kept for twenty females. Of those not wanted for breeding, the shepherd sacrifices some for his own use while they are young; the remainder he castrates and sells to the butcher. The female breeds at two years of age. They breed once a year, about four times, after which they are generally killed by the shepherds for their own use. For three months the kid is allowed the whole milk; afterwards the mother is milked once a day for two months; and eight goats will give a quart of milk. The excrement of both sheep and goats is much used for manure.