Animal Life in British Guiana.

BY

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PREFACE.

This volume is intended to be the first of a popular series on the Animal Life of British Guiana. It deals with the Mammals and Passerine Birds only, the latter including the great bulk as well as the commonest of the Colony Birds. During recent years while the writer was connected with the British Guiana Museum, he has been so frequently appealed to for information on the Natural History of the Colony, that it has seemed desirable to issue some such work, in which in a popular and compact form such local information may be found. The work by no means aims at being complete, the more obvious features being chiefly described. To have done otherwise would have necessitated volumes of quite a different character. Without technicality other than the giving of the scientific names of the species which are necessary to make the work of any real value, it is hoped that it will be a record of interest as well to the general reader as to the student. If it so proves, the object of the writer will have been attained, and other volumes will follow.

J. J. QUELCH.

CONTENTS.

CONTENTS. PAGE.

Animal Life in British Guiana.

General Remarks.

THE native animal life of the Colony, which is practically the same as that of tropical America generally, presents very many peculiar features of interest, more especially in relation to that of the Old World. Not only is there a remarkable variety and distinctness of specific and generic types, but also marked specialisation in the larger groups or families. Whole groups which include many of the most striking forms in other parts of the world, are here but barely represented, or are entirely absent, their places being taken by others not known outside the region. It would be an easy matter therefore to get together collections of animal types which, to persons only familiar with Old World forms, would appear much in the same light as a nightmare to the imagination.

Rich, however, as the district undoubtedly is, it is a striking fact that with the exception of certain obtrusive forms, chiefly of birds, frogs and insects, the animal life of the place brings itself but little under public notice. The swampy wastes of the coast, and the great forests of the interior, afford abundant shelter away from the

observation of man, and even along the great rivers and creeks by means of which one is able to penetrate into the recesses of the country, the traveller cannot but be struck by the apparent scarcity of life, except at times when as through the flowering or fruiting of certain trees, swarms of insects or great flights of birds, attract the attention. To the trained eye, however, the scarcity is far from being real, just as to the experienced aboriginal Indian, it is an ordinary matter to secure game of all kinds in the forest where an ordinary person would almost run the risk of starvation. The nocturnal habits, too, of many forms tend to increase the idea of their scarcity, when as a fact they may be really abundant in a given locality.

In spite then of the well-known luxuriance of tropical life, the visitor to our shores cannot but be disappointed, and sometimes pleasantly so, at the absence or scarcity of many of the creatures with which he had stocked the land in his imagination, just as the resident in our towns finds the interior on his first acquaintance to be far different from, and much less dangerous than, his expectations. Generally speaking the picture of our tropical travel is imagined to be crowded with incident after incident, in which poisonous snakes, noxious spiders, centipedes, scorpions and insects generally, not to mention blood-sucking bats, electric eels and many others, vie with one another, as it were, to render

life a burden; whereas, as a fact, these forms are but occasionally to be met with, and even when hunted for, are not easily obtained, except under special conditions which but seldom are available.

It can hardly be doubted that the general traveller is largely (if quite unintentionally) responsible for these unnatural pictures of tropical life. In the greater proportion of narratives, the experiences of years necessarily crowd in upon each other, incident upon incident, quite out of all proportion in regard to their actual occurrence, and one forgets the unmentioned days and weeks in which life partook more of the common round, and as regards remarkable incident or adventure, was quite monotonous.

True, death or dreadful injury may lurk in wait on the open savannahs in the bite from a rattlesnake, or in the forest from a labarria or fer-de-lance, or in the streams in the lash of a sting-ray, but cases of injury so rarely take place that, after a time, one hardly thinks of such things, and occasional encounters with mosquitoes, ticks, wasps and flies, are much more present to the mind. Naturally a nervous or timid person suffers in proportion to his fears, the more especially that numbers of perfectly harmless creatures are liable to be as great objects of dread as those that are noxious, and the possible dangers of land and water are ever present as the probable.

It is a noticeable feature of the animal life of tropical America generally that, with the exception of the Muscovy Ducks, no forms can be said to have become really domesticated for the uses of man, or have furnished the basis of any great industrial undertaking. Various species are regularly utilised as food when obtainable, but the supplies are far below the needs of the case. The domesticated animals which civilised man invariably carries in his train, the world over, furnish the regular supplies for food, transportation and other such purposes, though it may be doubted whether native forms might not beneficially be pressed into service. The turkey of North America has become a world wide and highly appreciated domesticated type of poultry, and the llama and alpaca of the Andes seem destined for a wider range of utilisation. Possibly the future may see the delicate maam as common as the turkey, and the tapir a helpful beast of burden.

In treating here of the animal life of Guiana as a whole, it will be out of the question to do more than describe the chief characteristics of the more common forms, and of those that from marked peculiarities claim attention. Owing to the large number of species in many groups, birds and insects more especially, very elaborate descriptions would be required to give anything like a correct idea of them, and instead of a general description within the understanding of all, a

series of technical treatises would be required which would be accessible to but a limited few. From the extension of research in all the great groups of animal life, and the constant additions to the number of known forms, the classification of animals presents a problem that is by no means easy of solution, and the literature of the great classes is gradually taking on a character that is as distinct in each case as the forms about which they treat, and requiring a special vocabulary of terms. Even in essentially popular works this special terminology can hardly now-a-days be avoided, accuracy of information requiring the employment of terms in common use among the workers in each department.

From a purely local point of view, the question of nomenclature is not an easy one to deal with. Except in those cases in which the forms are of economic value or special interest, the common names in use generally apply to several distinct species, the habits of which are practically the same, and sometimes these terms are quite misleading as to the affinities of the form referred to. In other cases, the names differ in different parts of the country, while a very large number have no common names at all.

The distribution of the various forms of animal life in the different parts of the colony presents an interesting field in which much remains to be done. The broad features are the same throughout, but the low

coast lands and the mountainous districts of the interior are marked by many special forms. Consideration of these points, however, must be deferred until sketches have been given of the various species of Mammals, Birds, Reptiles, etc., which claim notice.

CHAPTER I.

Mammals.

The mammalia or milk-secreting animals present some of the most distinctive features of the fauna, seen as well in the absence of the huge and striking forms found chiefly in the Old World, as in the presence of a large proportion of peculiar types, not represented elsewhere than in tropical America. Whole groups or families are conspicuous by their absence, such as the man-like apes, baboons and lemurs, the fox-bats, the elephants, the hippopotamus, the rhinoceros, the horses, the giraffe, the camels, the oxen, the sheep, the goats, the antelopes, the bears, the hyænas, the civet cats, the hedgehogs, and the moles and shrews; while the families represented by the ring-tail monkeys and the marmosets, the simple leaf-nosed bats, the cavies or guinea-pigs, the sloths, armadillos and ant-eaters, are strictly confined to this tropical region. The families, too, of the racoons and the opossums are almost as characteristic, a single species in each case ranging to the North American region.

Though destitute at the present day of indigenous mammals of any very great size, it seems that in comparatively recent geological times, Guiana possessed

a large number of really gigantic creatures. The fossil remains of Brazil and La Plata show that formerly the South American Continent was occupied by huge armadillos, sloths and ant-eaters, together with representatives of the elephants, the horse, the antelope, and many other forms which have become extinct, while representatives of the camels still exist in the Southern temperate regions.

With the exception of the three orders of the egg-laying mammals, the elephants, and the hedge-hog and its allies, the mammalia are well represented, and we will briefly consider them according to their orders.

I.—Monkeys *(Primates)*.

The American monkeys are well known as differing from Old World forms in several particulars. They possess four additional pre-molar teeth, but neither the cheek pouches nor the peculiar ischial callosities so common among the others. The septum of the nose, too, is thick, causing the nostrils to open outwards, and not downwards; and in a very large number of species, the tail is prehensile, in adaptation to their distinctly arboreal life.

Our most striking form is *Mycetes seniculus*, the howling monkey, locally known as "baboon," though it is quite different from those Eastern monkeys. When full grown, the howlers are about the size of a large

dog, but the throat and neck are immensely swollen out in the males owing to the extreme development of the hyoid portion of the larynx to form a deep and wide bony sac, which enables them to produce the astonishingly loud noises that far exceed anything that any other animal can bring forth. In the females the sac is small.

In the howlers the tails are remarkably prehensile, the terminal part being bare on the under surface, and even when the animals are mortally wounded and quite powerless to hold on by means of hands and legs, they will hang securely by the tail.

The hair in these creatures is long and soft, and of a prevailing reddish chestnut colour, passing into bright golden on the back. The tints are very variable, sometimes being quite pale, and at others intensely dark and rich. The skins are thus well suited for furs, and are becoming more and more in demand.

The flesh of the howler is eaten by the natives generally, and even by many colonists. It is, however, peculiarly rank, with a very strong and distinctive taste and smell, especially in the old specimens.

These monkeys are met with in all the forested parts of the country, except on the greatly elevated sandstone plateaux. They are very frequently seen on the trees by the sides of the creeks and rivers, and unless disturbed will seldom hide themselves or climb

away. Their thunderous cries are perhaps the most characteristic sounds before dawn, though they may frequently be heard at any time in the day or night. In confinement they seldom, if ever, thrive, and they lose all spirit, generally remaining morose and silent.

The common quata, or spider monkey, *Ateles paniscus*, will easily be recognised from its long, thin legs and body, covered with long, lax, black hair, and the absence of the thumb. The skin of the face is flesh-coloured, and the species is thus marked with a very human-like expression. The tail is of the same kind as in the howling monkey, but much more elongated, and it seems to be in constant use where opportunity offers, the whole weight of the body being supported by it as the animal swings from branch to branch, or from side to side of its house when in captivity. As a fact, this may be said to be the normal position.

The quata is a great favourite in confinement, being extremely gentle, docile and intelligent. They frequent dense forests, and are rarely met with in the low-lying coast lands.

It can hardly be doubted that it is this species which has given rise to the idea of a man-like ape or "Akreo" in the backwoods of the colony. The flesh-coloured face, more or less shaded with extended black hair, and seen indistinctly through vegetation, may well have appeared to the ignorant like the face of a man

of the woods, and the length of the black body, more especially when supported on the hind-legs in a semi-erect attitude, would but add to the delusion.

The capuchins, or ring-tailed monkeys, are those which are most commonly kept in confinement as pets. The tail is covered with hair throughout, and is much less prehensile than in the howlers and quatas. The hair is of a brownish colour, more or less mixed with black and grey according to the species, though so little is known of them at present in relation to sex, age and interbreeding over the great tropical district, that the species can hardly be said to be correctly determined.

Two forms are commonly met with in the colony, *Cebus apella* and *Cebus capucinus*. The former is generally larger, darker brown or black on the back, limbs and tail, with a black crown-spot on the top of the head, and often broadened to a sort of crest on each side of the face. In the second species, the colour is paler throughout, the sides of the forehead, throat and shoulders being quite pale. The crown-spot is small and extends in a narrow line to the base of the nose. This second species is much the commoner of the two, and is obtainable nearly all over the colony.

In the four preceding forms, the tails are markedly prehensile, capable of supporting the weight of the

body, and the end bones are flattened for grasping. In the remaining species, the tails are not prehensile, though they are frequently coiled round foreign objects.

The little sackiwinkis or squirrel monkeys, *Chrysothrix sciureus*, are some of our commonest forms, both on the coast lands and in the interior, where they are frequently met with in quite large troops. Their graceful little bodies with olive-grey fur, their human-like heads, their golden arms, and slender, elongated, black-tipped tails, will easily distinguish them. The sackiwinkis are amongst the most prized of monkey pets, becoming extremely tame and affectionate, and their activity is a never-failing source of surprise. It is a much-quoted peculiarity in this monkey that the back of the "brain proper" is relatively larger even than in man, projecting over the cerebellum to a greater extent than in any other mammal.

The little night-monkeys *(Nyctipithecus)* have been recorded from the colony, but they have never been met with by the writer. They are slightly larger than the sackiwinkis, and will easily be recognised by their soft brown fur, nocturnal habits, and very large, staring, owl-like eyes. They are certainly not common here, and may frequently be confounded with the similar nocturnal Potto or Kinkajou, which is however one of the Carnivora, readily distinguished by

the six front teeth (incisors) between the long canines, as in other carnivores, instead of the four found in the monkeys and in man.

Two little monkeys, with very long fur-like hair, and long bushy tails, will frequently be met with in small troops along the coast creeks and the interior generally. These are the sakis (*Pithecia.*) They have the chin broadly bearded, and the crown of the head covered with a divided wig. In the one, known as the white-headed saki, *P. leucocephala*, the body is black and the forehead yellowish-white, with a dark middle streak. In the other, or red-bellied saki, *P. rufiventer*, the fur is yellowish-red on the under side, and greyish-brown or black on the rest of the body. The upper edges of the lip are also yellow. In confinement they are timid, docile little creatures.

Very closely related to the foregoing are the "Beeza" monkeys (*Chiropotes*), occasionally brought down from the interior. They differ from the sakis in having shorter hair over the body, and shorter club-shaped tails. When adult, the wig is very abundant and regularly parted in the middle, and the beard is very long and thick, the whole giving a very old-mannish look to the creature. The beeza monkeys reach about the size of the common ring-tail, often appearing much larger and thicker owing to the longer hair. Adult males in confinement are liable to great fits of passion, and are not

always safe. The colour is dark, nearly black, the back and shoulders being yellowish-brown.

There is a great deal of confusion in the classification of these monkeys, as in the case of the capuchins; and as they live in the recesses of the interior, it is not an easy matter to secure series illustrating differences of sex, age and localities. Our common species is identified as *Chiropotes sagulata*, but the species *satanas* is very similar to, if not identical with, it.

The last to be mentioned are the little marmosets. They differ from all the others in that they have only thirty-two teeth, instead of thirty-six—one of the true grinders or molars being absent from each jaw. Their tiny size, black colour mottled with grey on the back, and reddish-yellow clawed hands, will readily serve to distinguish our species, *Midas ursulus*.

The marmosets become very tame when kept, and like the sackiwinkis, appear to breed regularly in confinement. They are timid and very curious, and are very agile in securing the insects on which they chiefly feed. They are met with occasionally in small flocks, but in the forest they are not easily secured.

II.—Bats *(Cheiroptera)*.

The bats, or flying mammals, present one of the most difficult groups to deal with. The great flying-foxes and the horse-shoe-nosed bats of the East, are certainly

absent from the district, and the group of the Vespertiliones, to which the greater number of the Old World forms belong, is only sparsely represented; but the family of the simple leaf-nosed bats is distinctly tropical American, while that of the Noctiliones, to which our commonest house-bats belong, is very nearly as characteristic.

Very many species have already been recorded from British Guiana, and it can hardly be doubted that, owing to their wide distribution, resulting chiefly from their powerful flight, many others, at present known only from Brazil and the adjoining districts, will also be found here. Their nocturnal habits, and the general inaccessibility of their hiding places, afford these creatures a large measure of security against capture, and as a result, the individuals of a species are generally extraordinarily abundant, living together in large numbers where they can safely congregate. The species that frequent buildings may thus become a real nuisance from the amount of dirt deposited and from the unpleasant odour; while, especially in the case of the smaller kinds which can easily take refuge under the eaves of the houses, above or within the gutters, and even under the slates and shingles, the fouling of the rain water which is collected from the roofs in vats and tanks for drinking purposes, becomes a much more serious matter.

Their depredations on fruit, too, may entail serious loss, the more particularly that they prefer the most delicate kinds. Netting the trees or fruit is sufficient protection, though often not a practicable one, and in many cases resort has been had to the placing about the trees of spiny materials, usually the leaves or stems of palms covered with long spines, which by the piercing of the wing membrane may damage the bats and eventually drive them away altogether.

In many localities the blood-sucking bats also cause considerable damage, and loss of stock and poultry may become a serious matter—not that the amount of blood directly taken by the bats is appreciable, but that the subsequent bleeding from repeated attacks leads after a time to great weakness, if not to death. This is the more difficult to deal with in that these bats generally attack the withers and other parts where use or movement keeps the wound more or less open, and the loss of blood soon therefore becomes excessive.

Where stock is stabled, it has been found efficacious to suspend in the open parts of the stable, clear round glass bottles, such as soda water bottles, filled with clear water. The bottles are not easily seen or avoided, and their extra weight imparts considerable force to the blows the bats receive and the little pests soon discontinue their visits.

In the more southern parts of the Continent, the blood-

sucking bats seem to give a good deal of trouble, but as touching the Colony, they do not appear to be particularly troublesome. Seba, on the Demerara River, has been the only locality under the writer's observation where stock has been dangerously affected, but this no doubt is largely due to the absence of stock from the forested parts of the country. Possibly the forms that occasionally here attack man and other creatures, are generally insectivorous, and the normal blood-suckers may not occur in the large numbers that are found in many other places.

The most striking of our species is perhaps the great fruit and insect eater, *Vampyrus spectrum*. This is the bat to which the common name "Vampire" should apply, but as it is quite free from blood-sucking propensities—the name being given originally under a mistaken idea of its habits—a good deal of confusion is caused by its application, since in popular parlance the vampires are essentially the blood-sucking forms.

This great bat, though never reaching the size of the flying-foxes or fox-bats of the East Indies, attains to a stretch of wings of quite three feet, though smaller individuals are generally caught. They will thus be readily recognised from their great size, and from their well developed leaf-nosed membrane.

As fruit-eaters, they would be from their size serious pests to cultivation, their greatly developed canine teeth

allowing them easily to seize and tear off from the trees whatever fruit they may desire. Fortunately, however, they do not seem to be abundant in the Colony. Hollow trees appear to be their usual places of refuge, and it was once the writer's experience to witness the exit of scores upon scores of these great creatures from a hollow tree on Plantation Melville on the Mahaica Creek.

The commonest of the fruit-eating and insectivorous bats, at any rate about the town and its outskirts, is *Artibeus planirostris*, a dark-coloured, thick and blunt faced form with a spread of wings of about from 16–20 inches, and with a thick, well-developed leaf-nosed membrane.

These bats will often be met with under the eaves or gable ends of houses both in the towns and in the country, and even under the coolers of the windows. With the exception of the tiny river bats, they seem to occupy during the day more exposed positions than other species, there being at times but the very slightest shelter for them. During the fruiting season, just at sunset, they will be observed darting up and down and around the trees, tearing out pieces of the ripest fruits, and often by the strength of the pull on the fruit, causing it to fall to the ground. The sapodillas are especial favourites, and large quantities of the fruits are lost if they are left to ripen on the trees.

Another common leaf-nosed species, found in the hollow trees about the town, and often occurring flitting about the houses at night, is the short-tongued red bat, *Carollia brevicaudata*. This is of a bright ruddy colour, with a stretch of wings of about 12 inches, and bearing a narrow, elongated nose-membrane.

This form, though slightly larger, may easily be confounded at first sight with the soricine or long-tongued red bat, *Glossophaga soricina*. In the latter, however, the tongue is extremely long and extensile, and it may be drawn out in the fresh state to quite twice the length of the head. It is also closely set with fibrils towards its upper extremity, like a sort of brush, and the lower lip is deeply channelled forming a sinus in which it seems to work. In all these characters, the soricine bat differs from the preceding short-tongued form.

From the peculiarity of its tongue, the soricine bat was formerly considered a very terrible blood-sucker, but it would seem that this extensile, hairy organ is of special use in licking out the pulpy matter of fruit.

The soricine bat occurs both on the coast and in the interior, being commonly met with in empty and deserted houses and sheds. It is a very common species at the various settlements along the rivers, and in the light of its having been regarded as a blood-sucker on account of the structure of the tongue, it is curious to find that among the natives generally it is the form

usually credited with the damage done to man and domestic animals. The structure of the median cutting teeth, which are enlarged and broadened, with a very sharp cutting edge, seems indeed to lend some likelihood to the idea, though there is no doubt that the greater quantity of its food consists of insects and fruit. In times of scarcity, more especially, it is probable that it supplements its ordinary food by blood-sucking where possible.

Two species of the blood-suckers have been recorded from the Colony, the common *Desmodus rufus*, and a new one collected by Dr. Young in Berbice, and named after him by Dr. Jentink of the Leyden Museum. These blood-suckers, which have a spread of wings of about from 12–16 inches are readily distinguished from all other kinds of bats by the structure of the teeth, the most obvious character being that the two upper cutting teeth (incisors) are as large as the canines, gouge-shaped and very sharp, fitted for acting on the skin much as a razor would. The grinding teeth and the stomach, are also modified through their peculiar habit.

These are the only bats which have ever been caught distinctly sucking the blood of animals, though, as already mentioned, it can hardly be doubted that certain of the Phyllostomids (leaf-nosed bats) vary their insect diet in this way. Many observers, indeed, are

inclined to think that certain of the latter species are the only blood-suckers in certain places.

The *Desmodi* are *the* vampires in ordinary parlance. As we have already seen, however, the name really belongs to the great fruit-eater, and for the sake of convenience of reference, it is a pity that the name cannot be strictly limited.

These bats frequent hollow trees, and caves and holes in the rocks; and in Brazil they have been caught in large numbers. In the Colony where they are frequently referred to as "Colony-doctor" by the common people, they appear to be less numerous, though cases often occur where persons are bitten in the interior of the country. The exposed toes are the parts that usually suffer, but in the case of many persons, who seem predisposed to such attacks, the hands and face may be bitten if the feet be covered. The bites are comparable to the delicate slicing of the surface of the skin by a razor.

Though the amount of blood taken by the bats may not be large, yet subsequent bleeding causes great loss, especially where the subject is repeatedly attacked, the more especially that the sufferers seldom are awakened by the operation. It was once the writer's experience on the Upper Berbice River to see a little Indian child who had been brought practically to death's door by loss of blood from the repeated attacks of

these creatures, and in such cases the matter is a serious one.

The commonest, and perhaps the most variable of our house-bats, *Molossus obscurus*, will readily be known by its small size (the spread of wing being from 9–11 inches), by its large ears, and by its strong feet, and long, more or less prehensile tail. It is the commonest of the Noctiliones, a group in which the nose-leaf is not even represented Owing to its small size and somewhat flattened body, it can creep through very narrow and small apertures, and they swarm about many of the dwelling houses and public buildings. These bats are frequently found on the floor, and they move about quite rapidly, the long tail acting like an additional leg.

Very similar to the above, but smaller (with a stretch of wings of about 8 inches), are the little greyish-black river-bats, *Rhynchonycteris naso*, met with along all the streams, clinging in a straight line under and along the stems and branches over the water, so as to lose all appearance of being living creatures, but flitting away like large moths when disturbed, to settle on other trees. These are our smallest bats, and in the river districts, the most characteristic.

Another bat very commonly met with in out-houses and in the hollow trees, is *Noctilio leporinus* which will at once be recognised by the peculiar overlapping and infolding of the lips, especially the upper lip. The

fur is of a rich foxy red, and the stretch of wings about 14 inches. The cutting teeth are peculiar, the lateral ones being very minute, and the median almost rodent-like, though small.

Another equally common red-coloured town bat, of somewhat smaller size, *Atalapha noveboracensis*, presents a very different structure of the cutting teeth, no median upper incisors being present, and the two lateral ones placed close against the canines. The under cutting teeth are six in all, and are closely arranged. The tail is long, terminating at the extremity of the membrane connecting the hind-limbs, a character which is a mark of the group, Vespertiliones.

To this group also belongs the curious small sucker-bat, *Thyroptera tricolor*, which is found among trees, more especially bananas and plantains, adhering by means of the peculiar circular pads, or suckers, on the base of the thumb and on the foot. It will readily be identified by these characters.

A very large number of other species, chiefly of the two first groups, will at times be met with, but the above are the most common or the most interesting.

III.—Rodents *(Rodentia)*.

The Rodents or gnawing mammals, include some of the commonest of our animals; and though the number of species may not be large, the individuals

are often extremely numerous. The familiar European rats and mice, which civilised man in his wanderings has unintentionally taken with him everywhere, are here, too, the most obtrusive and destructive members of the order, and are to be found in all the various parts of the country which are in communication with the towns —the native rats being found only in the more secluded settlements, and in the interior generally.

The Guiana rodents vary much in size, habits and general appearance. They will easily be recognised, however, by the peculiar arrangement of the teeth so characteristic of the order—the two upper and lower incisor teeth elongated and curved, and separated by a wide interval from the grinders.

The two forms known as the labba and the accourie, are the commonest and the most useful. The labba, *Cœlogenys paca*, is much like an enlarged guinea-pig, reaching sometimes to more than two feet in length, of a purplish-brown colour, spotted or lined with white along the sides, and white underneath. Its most peculiar feature, and one that gives its generic name, literally "hollow-cheek," lies in the possession of a peculiar chamber on each side of the face, formed by the extraordinary development and inflation of the cheek bones. These are at once apparent on the cleaned skull, and render the labba unique among all mammals.

These creatures are found plentifully distributed throughout the forest districts of the colony, and are easily caught by means of dogs, though the Indian huntsmen do not find much difficulty in securing them with the gun. They feed chiefly during the night, taking refuge during the day either in holes under the stems of trees, or in their own burrows. They run, jump and swim with remarkable ease, and readily take to the water if pursued. Their flesh is very delicate, and is equally appreciated by the native Indians and by colonists in general, among whom there is a common saying that "if you eat labba and drink creek water, you never leave the colony."

The labba is easily domesticated, breeding freely in confinement; and though they are shy and timid creatures, they often become quite tame. Their food consists of all kinds of vegetable matter, but nuts, roots and fruit, are preferred; and they will often be observed sitting on their haunches, holding their food by the fore-paws while eating, or cleaning their face in the most comical manner possible.

The accouries, *Dasyprocta aguti*, are even more widely distributed than the labba, and both to the Aboriginal Indian and the settlers in the country districts, furnish the commonest meat supply. They are somewhat smaller than the labba, being slighter and thinner throughout; the legs, too, especially the hind

ones, are longer, and the face not inflated, while there is a short, stumpy tail. In colour, they are of a variable olive and ruddy brown, the coarse hair becoming longer and thicker on the hind-back, and more ruddy.

In general habits the accouries are very similar to the labba, though owing to their more delicate build they are even more active and agile. The greater proportionate length of the hind-limbs renders the sitting posture, while feeding, much more an ordinary one than in the labba, and the actions of the creature are even more ludicrous. The flesh, too, is much drier and less delicate, and to be really enjoyed, it requires to be cooked with a large quantity of fat, as is the case with the flesh of nearly all our wild animals under ordinary conditions. It is exceptional to find any of these creatures really fat and in fine condition, except during a very heavy fruiting or favourable season.

Closely like the accourie in colour, form and habits, are the little adouries, *Dasyprocta acuchi*, which, being less than one-third the size, might frequently be mistaken for the young of the former species. The more slender build, and the possession of a slender tail of about two or three inches in length, will, however, be certain means of identification. The adouries are much less common than the accouries, and the flesh is much more tender and delicate.

The waterhaas, or waterhare, *Hydrochœrus capybara*,

may almost be placed with the labba and the accourie, considering the excellence of its flesh, and the wideness of its distribution. This, the largest of the rodents, is met with throughout the whole colony, being especially abundant in the low-lying coast creeks, and the swampy districts of the interior. In size they approach the common pigs, and though the bluntness of the snout and the absence of the curly tail are very obvious differences, even at a first glance, yet the general shape and size, and the hoof-like toes, at once call to mind the common ungulate type. The waterhaas, however, is but a gigantic guinea-pig, with aquatic propensities, for which its partially webbed feet distinctly mark it out.

In the grassy wastes of the lowlands they will be met with in fairly large flocks, seeking protection on the approach of danger in the waters of the creeks, where they may be pursued and hunted much as otters are in ordinary otterhunts in Europe, though with considerably better chances of securing them. Good swimmers and divers as they are, they yet cannot remain long below water, and reveal their course by the succession of air-bubbles from the lungs, so that to the experienced huntsman there is little difficulty in shooting them as they rise for breathing, even though they take advantage of every available means of cover. They invariably sink when shot dead, but there is little

time lost in securing them since they float in from two to four hours.

Though not as delicate as that of the labba, the flesh of the waterhaas is excellent, and if properly prepared may be compared to veal. Their tusk-like, cutting teeth, as also the finer ones of the accourie, are used for necklaces by the native Indians.

The native wild Guinea-pigs, *Cavia aperea*, will readily be recognised from their resemblance to the domesticated forms which have sprung from them, and from which they differ chiefly in being olive-brown in colour. Possibly they are commonly distributed in the grassy lands of the colony, but they have only been certainly obtained in parts of the Berbice and Essequebo coasts and on the great savannah and Roraima districts. The name "Guinea-pig" was evidently given through a mistaken idea or pronunciation of its habitat, since they do not occur in Guinea. "Guiana-pig" would be more correct, though "Cavy" is certainly better.

One species of squirrel, *Sciurus œstuans*, will be met with throughout the forest districts, but on account of its small size and the rapidity of its movements, it is difficult to detect it on ordinary occasions. They will be distinguished from all our other rodents by the long, whisp-like, bushy tail, generally bent back over the body.

These squirrels thrive well in confinement, and become quite tame, though they remain shy and timid with strangers. Their activity and vivacity are surprising.

Two species of tree-porcupines will occasionally be met with in the forest districts, though as they are nocturnal in their habits and hide themselves during the day, they are not often secured. Their hands and feet are specially adapted for climbing, in which they are greatly aided by the prehensile tail. The larger form, *Sphingurus prehensilis*, is about the size of a labba in body, and is covered by long thickened and pointed spines, which, however, are much shorter than the lengthy spines of the common European porcupine. The second species, *Sphingurus melanurus*, is much smaller throughout, and the light-coloured spines are almost hidden by long hair. The tail, too, is black towards the extremity.

The spiny rats present us with another interesting modification of the rodent-type. The commonest of the Guiana forms is *Loncheres Guianæ*, which is about as big as a medium-sized rat, with the body covered with harsh, stiff, flattened hairs, becoming more spine-like on the back. They are commonly distributed along the swampy coast regions, where they will frequently be seen climbing among the mangrove roots.

The native American rats, *Hesperomys sp.*, though

differing in the S-like pattern on their grinding teeth, are very much in appearance like the true rats *(Mus)* of the Old World. They will be found in the savannah and forest districts of the interior, generally about the thatch of the Indian houses. Quite recently (October, 1898,) a species was secured by Mr. F. V. McConnell and the writer, on the summit of Mt. Roraima. This particular specimen had clambered into a bucket of water during the night and was found drowned in the morning.

A great deal of work yet remains to be done in this group of rodents.

IV.—Beasts of Prey *(Carnivora.)*

The beasts of prey or flesh-eating mammals proper, include some of the most interesting of our animals; and the three great groups of the cats, dogs and bears are all represented. The jaguar, *Felis onca*, locally known as the "tiger," is the most striking of all the cats, and its beautifully spotted skin is in constant request. In size it is the second largest of all South American mammals, the tapir alone excelling it in bulk. Skins of from six to seven feet in length show what may be regarded as the usual size, but larger animals are frequently met with, and in one instance a beast of nine feet two inches in length has been shot in the colony.

In spite of its size, the jaguar is frequently confounded with the ocelot or so-called "labba tiger," but its markings are so characteristic that there should be no chance of such confusion. The black spots or blotches are arranged along the back and flanks so as to present a series of sub-circular figures, as in the true leopard of the old world; but while in the leopard the enclosed space in each is unspotted, in the jaguar one or more spots are always to be seen. The ground colour in the sub circular rings, too, is usually darker than that outside, which may vary in different animals from greyish to dark tawny, and in the special variety which has been described under a different term as the "black jaguar" *(F. nigra)*, even to a deep glossy black, in which the characteristic markings can only be perceived in certain lights.

The jaguar is noted for its peculiarly fierce expression, chiefly due to its normal habit of showing its teeth on the slightest provocation; and according to many records this fierceness seems to be borne out by its frequent attacks on man. In the colony, however, as in many other places, attacks on human beings are of very rare occurrence, except where the animal has been wounded; and its cowardliness seems to be a marked feature. A few cases of its attacks on Indians are narrated, and possibly these are explainable by periods of exceptional hunger on the part of the animals.

Certainly the only cases of an attack on human beings directly told to the writer by those who had suffered from it or had witnessed it, took place on the elevated upper sandstone or other rocky formations where the prevailing scarcity of food could well be understood as an inciting cause. Mr. A. B. Barnard, the American miner, has already placed, in the pages of the *Argosy*, one such case on record, in which, but for his assistance, one of his men would certainly have perished in the Upper Mazaruni district.

Apart from the wild game such as the water-haas, the deer, the peccary, etc., which are its usual prey, the jaguar seems to have a peculiar fondness for the domestic animals; and dogs, pigs, and cattle, are frequently attacked or carried off during the night in the more isolated settlements, and even in the immediate vicinity of man. In the case of dogs especially, the jaguar is inordinately rapacious, and even during the day, dogs have been carried off while ranging along a forest path individually. Quite a small pack of dogs, however, will cause the great cat to betake itself to a tree for protection, and this in fact is the only sure way of hunting the jaguar, as it then offers an easy mark for the gun of the huntsman.

On many of the open savannahs and elevated plateaux of the interior, the entrances to the wattled clay houses of the Indians are very strongly secured by wooden

doors for protection against jaguars, which not unfrequently prowl around the houses at night; but it may be regarded as certain that the hunting dogs secured in the houses, are the objects aimed at, and not the Indians themselves. Even from the middle of a forest camp at night, or from beneath a house in the country districts where they are tied for greater protection, dogs are carried off by their great enemy. As long as sufficient shelter exists within convenient range, such raids are of frequent occurrence, even in districts but a few miles from town, such for instance as in Canal No. 2 on the West Bank, Demerara River.

The attacks on cattle (calves where obtainable), are not less serious on certain parts of the coast, and frequently the owners will combine and pay each a small sum to a huntsman who will track and destroy the destroyer. The well-known habit of the jaguar of returning the night after to the carcass which has been partially eaten and generally dragged off for concealment the night before, usually affords the means for its destruction in such cases, whether the huntsman awaits the arrival with his gun or merely poisons the carcass. The two fine specimens mounted in the Museum of the Royal Agricultural and Commercial Society, are examples of animals killed by each of the above methods on the Drill cattle farm, which, some eight to ten years ago, was pestered by these beasts. Traps, spring-guns,

pits, etc., are also often used for the destruction of these creatures.

Though the jaguar may be described as being essentially cowardly, when wounded it becomes a dangerous creature, and many cases are known in which a careless and too close approach to a dying beast has led either to the death of the hunter or to a mauling which has left permanent disfigurement or disablement.

The canine teeth of this cat are greatly prized by the native Indians as parts of necklaces for children, who thus are regarded as under the protection of the spirit of the dreaded beast. The skin is also used for pouches, while certain of the bones are preferred for the bone-flutes in common use.

The second great cat, the puma, *Felis concolor*, is much less common than the jaguar. It seldom exceeds a length of six feet, of which more than two are formed by the tail which is strikingly long in comparison with that of the jaguar. The body, too, is slighter in build, and the colour a uniform tawny, though paler varieties are frequently met with. On account of its resemblance to the deer in colour, the puma frequently passes under the name of the "deer-tiger," just as the black variety of the jaguar is known as "maipurie-tiger."

The common name "American lion," is much more fitly applied to the puma than that of the "tiger" to

the jaguar, for the puma is much like a young lioness, whereas the spots of the jaguar have no resemblance to the stripes of the tiger.

It is a peculiar characteristic of the puma that even in the wild state it appears to be the friend of man. On the very best authority it is stated that not only does it not attack man, but that it will not even defend itself against him if brought to bay. When driven into a corner, and attacked with sticks, it will dodge the blows aimed at it, but it has never been known to spring on its assailant even for self-protection.

Perhaps the most extreme case that might be quoted in illustration of the friendliness of the puma towards man, is that mentioned by W. H. Hudson in his La Plata experiences. A hunter who had been thrown from his horse and had been injured in the leg, lay exposed on the plains through the night, and observed close to him a puma that remained, as it were, on guard. During the night the roar of a jaguar was heard, and the hunter gave himself up for lost; but whenever the jaguar approached, the puma went away and gave battle, until morning broke and both animals retired.

The story reads like romance, but case after case might be quoted, supported even by local experience, which tend to show that this ascribed characteristic of the puma, strange as it may seem, is a genuine matter of fact.

The Jaguarondi or "hacka-tiger," *Felis jaguarondi*, is another well-marked species of cat which is distributed all over the colony, though it is especially abundant on the coast districts. It will readily be recognised by its greyish-black colour, the individual hairs being dark at the roots and white at the tips, causing the skin to appear darker or lighter according as they are raised or depressed.

This cat reaches a length of about four feet, the tail being about 20 inches. As its local name implies, it closely resembles the weasel-like "hacka" in colour, but it is destitute of the white diamond-shaped blotch so conspicuous on the throat of the latter. In certain parts of the Essequebo and Corentyne coasts, the jaguarondi is the most persistent pest to poultry, its attacks being made not only under cover of night, but in the most open and barefaced manner during the day. Even after it has been tamed and domesticated, its rapacity for poultry is as pronounced as in the wild state.

Another well-marked species, though by no means a common one, is the "eyra," *Felis eyra*. This cat is smaller than the jaguarondi, reaching a length of a little more than three feet, inclusive of the tail, which measures about 16 inches. The colour is generally a bright ruddy chestnut, but paler and darker specimens are met with, and in some forms a distinct approach

to the jaguarondi is noticeable. The legs, however, are distinctly shorter, the cat taking on a somewhat weasel-like habit.

Very little seems to be known about the eyra in the colony. Specimens are very rarely seen, and it appears to be rare all over tropical America. Its habits are described to be very similar to those of the hacka-tiger.

The four species of cats already described will readily be recognised and distinguished. There remains, however, a series of forms commonly known under the general terms of ocelot, labba-tiger, margay, and tiger-cat, which present so many points of difference in extreme forms that they have been grouped under several specific names. In a large number of specimens, however, there will be found at the same time such great variations, and such general similarity and commingling of characters, that one is almost forced to the conclusion that there is after all but one species to be dealt with.

In colour they vary from tawny to grey, marked by dark spots, which may be simple blotches arranged in more or less linear series, or elongated, link-like spots with a black rim and paler centre, which is, however, darker than the ground colour of the skin. The tail is more or less ringed with black, and of a length of from 13 to 15 inches, while the body may vary in length from about 23 to 33 inches, being heavy and strong in

proportion to its size. The head is regularly striped, and bears a white spot behind the ear.

The form which is typically referred to here is that commonly known as the ocelot, *Felis pardalis*—locally known as labba-tiger, and tiger-cat, according to its size. Even in the adult skins of the typical largest form, the variations in colour, markings, and length of tail, are noteworthy, while the differences during growth are equally remarkable.

The ocelot is very widely distributed over the colony, being indeed our commonest cat. They are savage and voracious creatures, and in many of the villages and outlying settlements, they are extremely destructive to poultry, pigs and such-like small stock, committing depredations often put down to the jaguar, for which larger cat they are often mistaken. When hunted by dogs they betake themselves at once to the trees, in which their climbing powers render them safe from pursuit. In confinement, if fed on cooked meat, they often become extremely tame, but they are liable to break out at any time into savage fits, more especially the males, and they are thus by no means safe pets.

It is a marked character in the species of cats generally, and in fact in most of the carnivores, that the bony cavity of the skull in which the eye is lodged, is not completed by bone behind. This will readily be noticed in the skull of a lion, tiger, jaguar, or

puma, where the pointed ends of the bones above and below the eyes, do not meet behind. In the viverrine cat of the East Indies, however, these bones do meet to form a complete bony ring for the eye, and the same well-developed structure is found in a cat lately obtained near the mouth of the Potaro river in the colony. In its other characters, this species is so closely like the form described as *Felis macrura*, the long-tailed tiger-cat, that there can be no doubt that it is the representative here of that form, and if the peculiarity of the skull is a characteristic one, there can be still less doubt that it is sufficiently distinct from the ocelot, or other so-called tiger-cats, to constitute a definite species.

In this form the body is much smaller and thinner, and the tail much longer and more bushy than in the ocelot, while the fur is more uneven, and the spots much smaller and more scattered. In general appearance, in comparison with other cats, it looks much as though it had been in a constant state of starvation, or as if it had been drawn out on a rack.

Some reference should be made here to what are commonly known as "warracaba tigers" in the colony. These are supposed to be a peculiar kind of tiger or cat living in the forests, and travelling in large packs, and so fierce as to spread destruction to everything in their course—the only secure refuge being found on

the water, if one be lucky enough to be provided with a boat. They are said to have a peculiar cry by means of which their approach is known when they are on the hunt; but as no description has ever been given of them, and there is no record of one ever having been taken, they may be said to belong rather to the region of romance than of sober fact. Kindred tales will be found relating to the "akreo" or manlike ape, to the "water-mamma," the "didi," and other similar creatures, which are as real to the ignorant and credulous people living along the rivers and in the forests, as the objects of every day life. No doubt the belief in the warracaba tigers arose through natural causes in relation to some actual living creatures, and probably the wild hunting dogs *(Icticyon venaticus)* are the animals in question, but the amount of imagination in the common story certainly hides altogether what little sober fact there might be as a foundation.

Not long ago there was an account in one of the papers of the chasing of a man by these warracaba tigers, and the interest of the story lay in the fact that the man stated that he had only escaped from them by climbing up a tree. Of course all good believers in these creatures would see at once the untruthfulness of the story, since it is well known that these "tigers" could give points to any man in climbing.

The writer himself was once assured that a French

colonist in the Berbice river possessed a skin of the creature, but on application it was found that there was no such skin. We know too much of the animal life of tropical America to-day to entertain any such fanciful story as that of the warracaba tigers, but it would be a matter of some interest to trace to its source the origin of the story.

The group of the dogs is by no means as well represented as the cats, there being but two species. The commoner of these is the fox, *Canis cancrivorus*, often known as the "rough fox" or the "crab-dog." Usually the term crab-dog is applied to the S. American racoon, but it would be much better if it were limited to the present species. Strictly this form is much more of a jackal than a true dog or fox.

In colour the species is of a very variable gray—sometimes being quite pale, and at others comparatively dark, the top of the back and the tail, especially towards the end, being nearly black. About the sides of the head and shoulders, and on the under side, rufous patches will be noticed, and the soft under fur, hidden by the long hairs, has a distinct rufous tinge. The length and bushiness of the tail are also very variable.

Though the adults are savage and rapacious creatures, and great pests to the poultry yard, the young are easily tamed when properly taken care of. They are ill adapted for domestication however, their odour

being powerful and unpleasant. When brought to bay, they fight with great ferocity.

The second species, the wild bush-dogs or hunting-dogs, *Icticyon venaticus*, are rare animals in the colony, being apparently confined to the forests and the less settled parts, more especially in the Berbice and Corentyne districts.

In colour they vary from blackish-brown to pale ruddy-brown, the darker tints predominating on the hinder parts. They differ much from other dogs; and are peculiar in the reduction of the ears, the shortness of the limbs and tail, and the shortness and closeness of the hair. They are characterised also, by other structural features, and especially by a great reduction in the number and shape of the molar or hindmost teeth, in which they resemble the otters, and on this account they have even been classed by some naturalists among the weasels and their allies.

These dogs are known to hunt in packs, and, as already mentioned, it is probable, if not very likely, that the tales of "warracaba-tigers" are based on their occasional ravages.

The remaining Carnivora are all members of the group of the bears, walking not on the digits only, as in the cats and dogs, but on the soles of the feet. The racoons on the land, and the otters in the water, are the commonest of all.

The crab-eating racoon, *Procyon cancrivorus*,—the common "crab-dog" of the colony, differs much in appearance from its northern representative owing to the shortness of the fur. The body is thick and heavy in proportion to the short legs, and the snout quite short and pointed. The colour of the adult is much more ruddy-brown than in the smaller specimens, in which the hair is longer and darker. The tail is marked by black rings, and the eyes are encircled by black, giving a peculiar appearance to the face, as though the animal wore black spectacles.

These creatures are altogether omnivorous, and appear to be nearly as great pests to the fruit grower as to the poultry keeper. They are inquisitive and voracious, and even when tamed are about as troublesome as in the wild state. They are commonly distributed over the colony, becoming more numerous around the settlements. In spite of their apparent unwieldiness, they are very good climbers.

Much smaller and slighter in build than the racoons, are the kibihees, known also as "quashies," "coatis" and "coati-mondis." They will at once be recognised by the elongated flexible, nearly pointed, snout, which is in a constant state of movement, and which is always being inserted into the most unlikely looking places.

Two species of the kibihees will be met with, one of which, *Nasua rufa*, is of a rich ruddy brown colour,

while the other, *Nasua narica,* is much darker and nearly black. The tail is long and strongly ringed with black.

The kibihees are omnivorous like the racoons, and they appear, like their flexible snout, to be constantly on the move, hunting every variety of creature, insect or worm, they can detect. In a state of confinement they get tame to an offensive degree, and when loose in the house soon make themselves an intolerable nuisance. They are expert climbers, and will range through the trees at will in search of fruit, insects, and birds' eggs.

Closely related to the above, though very different in the appearance of the face, is the lemur-like kinkajou or potto, *Cercoleptes caudivolvulus.* The face of this little animal is short, and pointed at the snout; and the eyes are large and staring, in relation to its nocturnal habits. The fur is reddish-brown, abundant, and very soft, and the tail is long and prehensile. They are about the size of an ordinary cat.

In the colony these creatures pass under the common term "night-monkey," as already mentioned. In their nocturnal habits, prehensile tail and soft brown fur, they do certainly resemble the true night-monkeys, but there the resemblance ends, and the most casual glance should serve to distinguish the one from the other. The front cutting teeth, or incisors, are of course six above and six below, as in Carnivora generally—the

true night-monkeys having four above and four below, as in man.

The kinkajous are frequently kept as pets, and they become just as tame as the kibihees. Their food, too, is similar. During the day, they are inert and listless, and in fact will remain quietly asleep till evening, if left alone. Their restlessness and activity at night, however, are surprising.

Two weasel-like creatures will at times be met with in the neighbourhood of plantations, or in the savannah and forest districts. In the one, the grison, *Galictis allamandi*, which is about the size of the kinkajou, but with a short, non-prehensile tail, the colour is grey and black or blackish-brown, but the lighter colour is on top and the darker below, presenting a condition exceptional in animals generally, and one found but in a very few types, such as the badgers. In the second species, which is known commonly as the hacka, *Galictis barbara*, the colour is of a very variable blackish-brown, always lighter on the head and neck, and the chest bears a whitish diamond-shaped patch which is very conspicuous.

The hacka is much larger than the grison, with a longer, more bushy tail; and it is characterised by possessing one of the most intolerable odours among animals, though apparently by no means approaching the discharge odours of the skunk.

The grison and the hacka seem to be much alike in habits and disposition, though the latter excels in its voraciousness and rapacity. No doubt they fulfil a very useful part in life in keeping down the numbers of the smaller mammals on which they chiefly prey, but they become serious pests to man in the neighbourhood of the fowl-pen and the poultry-yard, more especially as they delight to kill for the mere sake of killing, and out of all relation to their actual needs at the time.

The otters complete the group of the carnivores. Of these two species occur here, and they are both very common, being found in perhaps every stream in the colony. They are often met with in flocks of a dozen or more, and they will rise, head and neck out of the water, at a short distance from the boat, as though to get a thorough good look at the disturbers of the peace. Frequently they will respond to the calling cry of the boatmen, and rise momentarily at quite close range, diving backwards and forwards, and breaking back again when pursued, as though in actual trifling with the hunter. When shot, however, it is seldom they are obtained if they be dead, for they sink at once, and only float when the fur is spoilt. If they are met with feeding or gambolling on the banks of the river, or in shallow water where they can be reached, the chances are of course on the side of the hunter.

Occasionally their young will be met with in little homes or nests constructed of grass or soft leaves beaten down on the banks of the streams. It was once the writer's experience to come upon such a nest in the grass of the savannahs on the banks of the Abary Creek, in which there were five young ones sufficiently developed to move about and to squeak, the old ones having scrambled off into the water. An old boatman took one of the young to the boat, and by causing it to squeak, soon brought into close proximity quite a family of adults which kept on making their characteristic cry, and one or more of which made repeated attacks on the paddles in the water, savagely biting pieces from the blades. After securing a fine specimen, the young one was taken back to the nest, but it was found that the others had all been carried off, presumably by their parents, for before they had been huddling together.

The two species will readily be distinguished. In the one, the ordinary otter, *Lutra brasiliensis*, the nostril is nearly naked, and the tail is round; while in the other, the margined-tail otter, *Pteronura sandbachii*, the nostril is covered with hair, and the tail is flattened, with ridges at the sides. This latter form, too, bears a yellowish-white blotch on the under part of the neck, and the brown fur is much paler, shorter, and softer than in the other form.

The otters reach a very large size in the colony, and the very fine specimen of the margined-tail otter, taken in the Tapacooma lake, and now mounted in the Museum of the Royal Agricultural and Commercial Society, measures just over six feet. Much larger specimens are occasionally secured by the river people, but as a rule the skins are ruined through not being properly cleaned and cured. The abundant fat usually found on them soon causes decay, with consequent dropping of the fur.

V.—Hooped Mammals *(Ungulata.)*

This most useful group of animals, which includes the horses, pigs, oxen, sheep, etc., so common in the old world, is represented here by but three types, the tapir, the peccary and the deer, numbering in all about six or seven species. In ancient times, the hoofed animals were certainly more abundant over S. America generally, the horses for instance being a characteristic form, as indeed they have become again on the southern plains since their re-introduction into the continent.

The tapir or "maipurie," *Tapirus americanus*, is our largest mammal, and from fossil remains of the genus in Europe, it appears to be the oldest existing type. Though very hog-like in general appearance, it is much more closely allied to the rhinoceros and the horse, and the structure of the head and feet is very characteristic.

The name "bush-cow" is in common use among the creole peasantry, but it is by no means an appropriate term.

In size of body, the tapir approaches the donkey, but the neck and legs are much shorter, the tail is reduced to a short stump, and the head is not only highly angular on the forehead, but on the muzzle and snout it is elongated to form a short movable trunk bearing the nostrils at the end, and by means of which they grasp their food. The feet are peculiar in bearing three toes behind and four in front, though the fourth is not really used; and the median of the three functional toes, is enlarged.

The hair of the tapir is short and close, and of a brownish-black colour, the edges of the lower lip, the middle chin and the edges of the ears, being whitish. In the young, white blotches occur along the body, recalling the similar marking on the local fawns. The hide is excessively tough and thick, and by certain of our native Indians it is used in making the cover of the quiver for the poisoned blow-pipe arrows, and occasionally for sandals instead of the more usual eta-palm leaf-bases so commonly worn on the rocky trails in the interior.

These animals are found throughout the forested districts of the colony, and even on the open savannahs in the neighbourhood of the bushy clumps by the streams,

Though chiefly nocturnal in their habits, they will frequently be met with by day both by land and water, and they appear to have a particular fondness for the latter element. They feed on all varieties of vegetable matter, but fruit and delicate succulent plants are much preferred, and in favourable seasons when these are found in abundance, the animals are in splendid condition.

The flesh of the tapir has been by some considered unsavoury, coarse and dry; but surely some ancient, badly nourished animal must have been in question, fit to be compared with an ancient, shrivelled cow, which even with a refined cuisine can hardly be prized as beef. Ordinarily the flesh of the tapir, in spite of indifferent bush-cooking, is delicate and delicious, particularly so in the case of young and well-nourished animals. The flesh naturally varies in flavour according to its condition, as in the case of other animals, but certainly some of the most delicate meat ever eaten by the writer, has been the boiled flesh of a young and fat tapir, which in the first instance had been merely preserved by the ordinary Indian method of babracotting over smoke and fire.

When obtained quite small, the tapirs become tame and mild in captivity, and they have often been thus taken when the parent is shot, and have been more or less domesticated. It has, in fact, been proposed

or suggested by many persons that if thoroughly taken in hand, these animals could and should be utilized not only for food, but as beasts of burden, for which their great strength peculiarly fits them. They are now known to breed regularly in confinement, and as an object lesson in this respect in domestication, the series kept in the Botanic Gardens by the Superintendent, Mr. G. S. Jenman, one of the most enthusiastic lovers of animals, offers an admirable instance. For general reasons, more especially for the safety of the creatures, they are now kept in enclosures, but originally they were allowed to roam about the Gardens and the adjacent roads, from which they occasionally strayed for a few days, always eventually returning ; until some dastard hand lodged a charge of shot in the face of one of the females, blinding one eye, though evidently the intention had been to procure the carcass.

With facilities for breeding, and their known mildness and strength, the problem of their utilization as beasts of burden, does not seem to offer any great difficulty, though the Asiatic species, from its larger size, would no doubt be preferable to either our local species or the hairy tapir, *T. villosus*, of the Andean districts.

The peccaries or bush-hogs represent the swine on the American continent, where there are two well-marked species, both of which occur plentifully in the colony.

They differ from the true swine chiefly in the reduction of the teeth, in the fusion of the lower middle leg-bones to form a cannon-bone as in cattle, and in the possession of a peculiar odour-gland on the hind-back, the smell from which is powerful and unpleasant. In fact, so penetrating and persistent is this odour, that the gland is at once cut out from the body when the peccary has been slain, to prevent the tainting of the flesh. The real function of this gland, moreover, up to the present, is unknown.

In bulk of body, the peccaries are but medium-sized pigs. In the smaller and more common form near the coast, the colour is of a variable blackish-grey with a white collar round the neck and shoulders. This is the abouyah or collared peccary, *Dicotyles torquatus*, while the larger form, the kairuni or white-lipped peccary, *D. labiatus*, is of a much darker and ruddier colour, the under jaws being white along the edges.

Both species range over the forested districts, the kairuni being more common in the far interior, and they are met with at times in great flocks. They do not readily take to the water, but they can swim with ease, and are occasionally met with crossing a river, when they are slaughtered unmercifully for their flesh. They are omnivorous feeders, "rooting" up the ground in search of roots or insects or worms, and in favourable fruiting seasons they are in fine condition. Usually,

however, the flesh is dry, as in the accourie, and requires to be well basted with fat, or interlarded as in the case of venison.

Perhaps the most peculiar characteristic ascribed to the peccaries by travellers, and one that is found repeated in works on natural history, is that of their fierce attacks on whatever comes in their way, and of their driving huntsmen up into trees for the safety of their lives. And yet both species have been met with by the writer, often in large flocks, both in the forest and on the open plains, and far from any attack being made by them at any time, they have always been hunted and pursued by huntsmen, sometimes for hours, to secure as much meat as possible to be preserved against the day of need—supplies of meat for a large party being often procured with difficulty, if at all, while travelling in many parts of the far interior. The common story is the more difficult to understand, in that the peccaries have been met with by the writer and his men at all seasons of the year, and when too there have been young pigs in the flock, when, one might think, the parents might show fight for their young. And this too may be mentioned, that even Indian boys with cutlasses will join in the chase, so little fear is there among them of these supposedly fierce creatures. The champing of their teeth when they are disturbed, is no doubt an ominous sound, and this possibly may have

led to some nervous person climbing up a tree; but even this smacks too much of the imagination.

In confinement, however, while usually the peccaries become quite tame, they have been known to make quite fierce attacks on human beings, though in such special cases there may be inciting causes that would not operate in a state of nature.

In treating of the deer, there is a difficulty at the outset, in that a good deal of work yet remains to be done at the wood-loving species. Properly prepared skins are not often secured, the ordinary run of huntsmen merely keeping the skin of the body while the head and often the feet are cut away. The skin of the head, and the skull, are essential features, and should always be preserved for the identification of the deer. Four species are certainly known.

The commonest is the well-known savannah deer which is found on all the open lands both on the coast and in the interior, and is frequently taken aback of the estates, being usually driven out by the bush-water. They are not as large as the fallow-deer of the Old World, and the antlers are not flattened but sub-cylindrical, with a small basal inner tyne or prong, and with prongs or forks—sometimes as many as four or five—on the hinder side, though never reaching to more than about a foot in total length.

This deer is of a pale yellowish-brown, with blackish

diverging hair on the forehead and crown, and large ears. The under side of the tail and the tip are white.

This is the *Cariacus savannarum* of Cabanis and Schomburgk, which appears to be identical with the Mexican deer, *C. mexicanus*. This latter species again seems to be but a smaller and more southern form of the Virginian deer, and no doubt must be referred to it.

Another form known elsewhere as the "Guazu," of much the same size, but with antlers destitute of the basal tyne, and simply erect and forked at the top, appears to be very rare in the colony. It belongs to the genus *Blastocerus*. Owing to want of material, it is impossible at present to fix the species.

The remaining brockets will be recognised by their simple pointed antlers, destitute of tynes or prongs. The commonest is the Red deer, *Coassus rufus*, which is found on more or less open lands, especially by the forest or bushy clumps. This is somewhat smaller than the savannah deer, though the body is as a rule more bulky. The colour is of a deep rich chestnut-red.

The "welibiciries" or "wiribiciries," the common wood deer of the colony, are much smaller than any of the above, and are much more slenderly built throughout. They appear to vary much in colour, from a very pale yellowish or greyish brown to a deeper reddish brown, no doubt according to their habitat; and though

they have been described under two separate specific terms, it seems likely that there is but one variable species in question, viz., *Coassus nemorivagus.*

As already mentioned, the fawns of all the deer are spotted with white along the sides of the body. The commoner species are frequently kept in captivity, and become more or less domesticated, breeding readily. Various forms are always to be seen in the Botanic Gardens, or in the yard of the Superintendent's house, though the trouble given by thieves and dogs would be enough to discourage any but the most ardent naturalist.

The deer are fairly plentiful, and venison is by no means an uncommon dish in the town. Its appreciation, however, depends very largely upon the method of preparation for the table—as in the case of so many other things.

VI.—Aquatic Mammals *(Sirenia & Cetacea)*

Under this heading are included those mammals which never leave the water. Of the small group of Sirenia a single species occurs, found both in the sea and in the fresh water. This is the manatee, *Manatus americanus,* known commonly as "water-cow," "sea-cow," or "quemow." As in the whales and their allies, the body is perfectly adapted to the aquatic mode of life. The hind-limbs are absent, though rudiments of the hip-bones are present; the fore-limbs are reduced

to small flippers; and the tail is flattened and horizontally expanded to form a very powerful swimming organ.

Though resembling the whales in many characters the manatees are distinguished by having the nostrils towards the end of the blunt muzzle, and not on the top of the head, while the structure of the wind-pipe is quite different; nor is there ever a dorsal fin or hump on the back. They are peculiar among Mammalia in having but six joints in the neck region of the backbone, instead of the usual seven.

The manatees are strictly herbivorous, and feed on all varieties of soft and succulent plants, to reach which they will at times work themselves nearly half-way out of the water, on to the land, by means of their flippers and tail. They are plentifully distributed along the coast and coast creeks and rivers, being less frequently met with in the streams in the interior. Often too they will be found in the drainage canals which they enter from the sea when the gates or kokers are open. In the wet weather, they will be met with over the flooded swampy lands adjoining the various creeks, and they are readily harpooned by the practised huntsmen. Small boats like the common corials are by no means safe from swamping, however, the startled plunges of the manatee causing considerable turmoil in the water.

The manatees are frequently kept in ponds and ornamental waters, and in the tropics they thrive as well in this state of confinement as in their native haunts. Visitors to the local Botanic Gardens may at times observe them in the lakes, though the watching may often be greatly prolonged. It has been reported that animals kept in small ponds even become quite tame, coming at call to the edge of the pond.

Several attempts have been made from time to time to introduce the manatees into Europe, but they have been repeated failures, the creatures seldom surviving the voyage, and then usually but for a few months. As might be expected, the attempts appear to be much more successful with the younger animals than with the adults.

The manatee usually attains a length of ten or twelve feet, though much larger creatures are said to have been met with. A recently extinct form of the order, known as Steller's sea-cow, and which was certainly found plentifully in the living state a little more than a hundred years ago in the neighbourhood of Behring Straits, reached much more gigantic proportions, ranging nearly to 30 feet in length.

The account of the extinction of this huge Sirenian reads like romance. When the explorer Behring, with the naturalist Steller, visited the straits to which his name was given, these huge beasts were found in large

numbers, living in herds of many individuals, on Behring's Island. As the flesh was vastly superior to the salt food of the sailors, Steller advised its being eaten, and so heartily was this done both by sailors and natives afterwards, that in less than 30 years not a single specimen remained. In fact, but for the very complete account given of the creature by Steller, nothing would have remained to indicate that such a form had ever existed.

The manatees are much appreciated as food, and the flesh of the younger specimens is delicate and veal-like. In the old specimens it is tough, dry and rather coarse. The skin is excessively thick, and not unlike that of the elephant, with stiff scattered hairs, which become bristly on the upper and under lip.

To any one viewing these ugly and ungainly creatures and their Eastern allies, the dugongs, it is difficult to believe that they could have given rise to the marvellous stories of the mermaids and sirens of old. We know, whoever, that it is so, and the appearance of a female with enlarged pectoral breats, clasping her little one to her body, among floating weeds in clear water, might well have been the foundation of the stories of the fabled beauties and enchantresses in the old mysterious days. Beautiful fancy easily would furnish the necessary embellishments.

Of the Cetacea or whales, and their allies, three

species may be mentioned. The common dolphin, *Delphinus delphis*, passing locally under the name of "porpoise," is met with in the estuaries of the rivers, and along the coast. They range to about from six to seven feet in length, and will easily be distinguished from the true porpoise by the produced, sharp-nosed snout or beak. It seems curious that even to-day, these pronounced mammals should be popularly regarded as fishes.

Another form entirely confined to fresh water has been described from the Takutu branch of the Rio Branco by Schomburgk. This species is quite unknown to the writer, but it would appear to be identical with the common fresh-water dolphin of the Amazon, found widely distributed over that great water-way, and referable to the genus *Inia*. Various large fresh-water fishes while "playing," have so much the appearance of rolling dolphins and porpoises especially when seen at a little distance, that they might easily be mistaken for them by the inexperienced; but there is no doubt of the real occurrence of *Inia*, though how many species there may be, there is nothing at present to show.

The third Cetacean is one of the true baleen whales, apparently *Balæna australis* of the S. Atlantic. A young specimen of this form was once stranded on the Essequebo coast, but unfortunately the skull alone was saved.

Other members of the group no doubt occur off the coast, but from the shallowness of the water, they seldom come within sight from the shore or in the course of the common sailing crafts.

VII.—Edentate Mammals *(Edentata.)*

The mammals included under this order, the sloths, armadillos and ant-eaters are peculiar among local forms, not altogether from the total absence of teeth, as the name would seem to denote, but from the general absence of the middle incisor or front teeth, which are so characteristic of all our other land Mammalia.

The edentate mammals are well-known to be the most characteristic of S. American brutes, the more especially that they represent the waning features of a fauna which in the very latest geological period were predominant and imposing. The Southern American region is still, as it was in long ages gone, their home; and with the exception of a very few Asiatic and African forms, the various members of the group do not occur outside it. The existing species, however, are but pigmies when compared with many of the most recent fossil forms, which were altogether gigantic in their proportions.

One of the most interesting discoveries lately in Natural History relates to the finding in Patagonia of parts of the skin of a gigantic edentate, a close relative

apparently of the great extinct ground-sloth, and one which there is every reason to believe, must have been living within from 50 to 100 years ago. Unfortunately only parts of the skin are known, but these shew that the skin has been taken in a fresh state from the body by man, and that we are dealing therefore with an antediluvian creature which has survived to our period.

Of our species, two sloths are the most common. Until quite recently all existing sloths were classed under two names, the two-toed and the three-toed forms, according to the number of the digits in the fore-limb ; but owing to various other differences, several species are now recognised over the equatorial districts.

The grey or three-toed (better "three-fingered") sloth, *Arctopithecus flaccidus*, also known as "ai" on account of its cry, is a common arboreal animal in the colony, being frequently met with in the vegetation along the river districts, climbing about suspended by its legs, or gathered up into a bundle in some convenient fork or other suitable position. In this latter case they are often with difficulty distinguished owing to their resemblance to various forms of vegetation and even to ants' nests when high up in the trees. Though they are able to climb fairly rapidly at need, hand over hand, or suspended back downwards along a branch, their movements are usually indolent ; and when placed on the ground they haul themselves along with great

difficulty, sprawling on their belly, the formation of their limbs not allowing the body to be raised from the ground.

In length of body, from the snout to the end of the back, the three-fingered sloth reaches as much as two feet, the fore-limbs being very much longer than the hind-limbs. The body is covered with long, close, flaccid hair of a grey colour, more or less mottled with white or dark streaks, and often partially green-tinted owing to the presence of an Alga on the hairs. On the forehead the long hair stops abruptly, and the face is covered with short yellowish hair, giving a peculiar aspect to the brute.

It is invariably a surprise to the inexperienced to stroke the hair of the sloths, for while it appears shaggy, coarse and harsh, it is in reality particularly soft to the touch, an effect that is considerably heightened by the delicate under fur. In the males a peculiar short-haired, black and orange-coloured patch is present on the back between the shoulders.

The three claws on the fore-feet are greatly enlarged and elongated, much more so than those on the hind-claws, and they are thus well fitted for grasping and hooking on to other objects. The sloths will thus pull to their mouths the various kinds of leaves and fruit on which they feed, and in confinement they will often be observed holding a piece of fruit to their lips while they

lazily feed on it. People, as a rule, are much alarmed at the idea of being grasped by the claws, but the pressure is by no means a painful one, and the only thing to avoid is the stab of the sharp points of the claws if the long arms are swung round when the creature is irritated.

The three-fingered sloth is, however, a mild and inoffensive creature; and while it will generally put out its arms as though to attach itself to surrounding objects or to pull them to its mouth, it seldom makes, even on irritation, the savage lurches so noticeable in the larger two-fingered species.

The "ai" is peculiar in the large number of the neck joints of its back-bone. Here there are nine, as against the usual seven in other mammals—the manatee, it will be remembered, being an exception with six only. The power of the "ai" to move its head right round or down, so as to look at objects immediately behind or beneath it, is due partly to this, and partly to the structure of the joints themselves. In other sloths, the neck vertebræ may be 9, 7 or even 6.

The teeth of the "ai" are all grinders, as in the other sloths; and, as in the armadillos, they are peculiar in the absence of the outer coating of enamel, and in their never forming roots. As the teeth wear away on top, they grow up from below from persistent pulps. Though the front teeth are absent, the sloths can yet bite severely

with the anterior grinders, as may be easily found out on careless handling of the two-fingered form particularly.

The flesh of the "ai" is extremely tender and delicate in flavour. It is, however, seldom eaten, even by natives. The larger birds of prey, and the carnivorous mammals are much more appreciative, and occasionally in tramping through the forest, the traveller will come upon the hairy remains of such a feast.

The brown or two-fingered sloth, *Cholæpus didactylus*, also known as the "unau," is much less common, and much larger than the three-fingered "ai." It is a much fiercer creature, and large specimens are often very savage, making desperate lunges with their sharp claws when they are approached. The young specimens, however, are much quieter, and can readily be tamed.

In this form, the hair is reddish-brown, sometimes tinged with whitish on the top of the body, where the greenish Algoid tint is also frequently noticed. The fur is very soft, and much longer than in the "ai," and the skins are suitable for rugs, muffs and other such articles. On the forehead the fur does not stop abruptly, but gradually shortens.

Though this species is two-fingered, there are three toes on the hind-limbs, as in the "ai," and the claws are much longer than in the latter form. The flesh is

by no means as delicate as in the "ai," though probably it may be variable in all these forms, depending somewhat on the nature of the leaves and fruit on which they feed.

If carefully looked after and fed in confinement, the sloths live for a considerable time, and they are well known as possessing a very great tenacity of life, lasting for long periods without food. Though generally regarded as stupid and unintelligent creatures, the following case certainly places them in a somewhat different light. In one specimen of the two-fingered sloth kept for some years in the Museum of the Royal Agricultural and Commercial Society, it was curious to observe that, after it had been subjected for some time to being carried, a little before 4 o'clock, to a certain box to be shut in for the night, it began regularly to go to its box, of its own accord, a short time before the hour for closing came round. This it regularly continued to do for some months, climbing along the balustrade on which it generally perched during the day, and thence by a series of cases, or hauling itself along the floor as happened to be at times the only available way. It was never necessary at this time to close the box for the night, for the sloth always remained in it till the windows of the room were opened in the morning, when no doubt the bright light tempted it out. Nor did it ever, during other parts of the day, attempt

to climb away from the balustrade, to some part of which it had always at first been tied.

Some months after, it suddenly dropped the habit, when it found that another sloth—a large specimen of the three-fingered form—was always placed in the same box to sleep ; and even after its chamber-mate died, it never revived the habit, having always to be placed in the box as at first. It had evidently become altogether suspicious of its former companion's possible intrusion.

A curious feature of the incident lies in the gradual association by the sloth of a certain time of the day, with that of retiring to its box—a time when the light was still bright. Had it been at night-fall, there would have been less of interest in the case, though doubtless the degree of light, or the observance of shadows at the time, would furnish nearly as good means for association for the creature, as the absence of light itself.

The armadillos will readily be distinguished from the sloths, and in fact from all our other mammals, by the peculiar bony plates of the skin which cover the upper part of the body and the head and tail, and between which only a few sparse hairs are met with. The head is much longer in proportion than in the sloths, and the teeth correspondingly more numerous, while the tail is long and well-developed.

These are strictly terrestrial animals, preferring the savannahs or open sandy or bushy wastes, though rang-

ing also through the forest districts. By means of their strongly developed claws, they burrow with great rapidity, and in sandy ground it is with great difficulty that they are secured. On account of their burrowing propensities, they occasionally do considerable damage to empoldered lands; and in search of the carrion for which they are said to have a peculiar fondness, they will dig out the buried bodies of animals, and even graveyards have been known to have been ravaged by them, wooden coffins, unless of considerable strength, offering no obstacle to their attacks. The armadillos usually, however, feed on fruit, roots, insects, worms and other creatures.

The flesh of these animals is white and veal-like, and is said to be very delicate by those who have tried it; but their carrion-eating propensities deter a good many from the trial. The cooking is apparently often of the simplest, for as with a potato, baking in its own skin seems to be about the best method of procedure.

Three species of these creatures will be met with in the colony, of which the rarest is the great or giant armadillo, *Dasypus gigas*. This form reaches a length of body of about three feet, with a tail of more than half that length, and the body is broad in proportion. The claws are greatly enlarged; but the most peculiar feature lies in the teeth which, during early life, number often as many as 100, there being from 20—25 in each

jaw. With age this number becomes reduced, many dropping out. Owing to the excessive number of teeth, and their sharp edges, the name of Prionodontes, or "saw-teeth," is often used for this form.

For the general observer, the great size of this form is sufficiently distinctive; but another character which can readily be noticed lies in the more or less uniform size and shape of the plates which cover not only the shoulders and loins, but the central parts of the body, where a series of from 11 to 13 transverse rings shew a considerable amount of mobility allowing a free play of the limbs, and a general flexibility of the body.

Common as this species appears to be in many places outside the colony, here it is certainly a very rare creature, and in the local Museum, the only representative of it is the dorsal shell of a large specimen. Possibly its apparent scarcity may be due to its nocturnal habits.

The commonest armadillo is that known as the tatouay or "yaysi," *Dasypus tatouay*. In this species, the body is but slightly more than a foot in length, and the tail and head are short, the latter furnished with short, spreading ears. It is very much like a small specimen of the giant armadillo, but is readily distinguished by the fewer teeth (always less than 50), and by the fact that the bony plates of the central transverse movable bands on the back, are furnished with straight edges as compared with the irregular or notched

edges of those on the other parts of the body. This character is noticeable at a glance.

The third form is not very common. This is the peba, *Tatusia peba,* also known as "yaysi" in the colony. This armadillo differs markedly in appearance from the two preceding. The whole body is elongated throughout. The head is elongated and ends in a long, narrow snout; and the tail is nearly as long as the body.

The bony plates on the transverse movable bands on the back, are much longer and larger than the others, and owing to this these bands are much more distinct than in the other two species. In all armadillos the movable bands increase in number with age, though thirteen bands seem to be a maximum.

Many other characters distinguish this form, such as the large erect ears, the comparative smallness of the claws, the presence of two mammary teats in the groin as well as the usual two between the shoulders, and the complete set of teeth replacing the milk teeth in adult life, not found in the other species.

The peba reaches a length of more than three feet, but it never attains the great size of the giant armadillo.

The ant-eaters are distinguished from the sloths and armadillos by the entire absence of teeth. The jaws are always more or less elongated, and the mouth forms

a small opening at the end of the small tapering snout, through which a very long flexible, whip-like tongue is protruded at will. The claws are enlarged, and form effective digging organs for tearing up the ants' nests. The long sticky tongue, laid along the broken nest, soon becomes covered with the swarming ants, and by its rapid withdrawal and repeated protrusion, the animal is able to secure a sufficiency for its needs.

In the three species which are present in the colony, the great, the middle and the small ant-eater, the body is covered with hair, and the tail is long and hairy; but while in the latter two forms, the tail is prehensile, in the former it becomes a huge long-haired brush which is frequently carried curved over the back, as though to give protection from sun and rain.

The great ant-eater or ant-bear, *Myrmecophaga jubata*, is of a dark gray colour, with a black patch on the breast reaching up obliquely across the shoulders. From the tip of the snout to the root of the tail, it measures nearly five feet, the tapering head being more than a foot long, while the tail is about three feet. In height it stands about three feet, being somewhat higher at the shoulder. The body is thick and heavy, and the creature is thus a powerful, though quiet and inoffensive beast. When irritated or attacked it defends itself with its huge claws, and the hug from its powerful arms is dangerous—so much so that it is said to be a match for the jaguar,

though that hardly appears to be likely unless with great inequality in the sizes of the two forms.

This large ant-eater also goes by the names "tamanoir" and "barima" They are found chiefly on the savannah or open lands, and the females present a peculiarly grotesque appearance when they are encountered carrying their single young one perched on the back, a position that the young occupy until they are even quite a fourth the size of the parent. This species is strictly terrestrial.

In confinement, the ant-bear thrives well on a diet of milk, eggs and finely chopped meat, and this is adopted for them in Zoological gardens generally.

The middle ant-eater, *Tamandua tetradactyla*, is much smaller than the ant-bear; and as the prehensile tail indicates, it is arboreal, being found throughout the forest districts, especially in the forest openings by the rivers and creeks, where they are more readily observed. The snout is much shorter than in the preceding species, and the hair on the tail is short, more especially towards the extremity.

In colour these creatures are very variable, all shades being met with between a pale yellowish gray, and a dark reddish or blackish brown. But for the tail and elongated snout, they are not unlike a sloth in appearance.

The last edentate to be mentioned is the little two-

fingered ant-eater, *Cyclothurus didactylus*. This is but a pigmy among the others, the body being hardly larger than a squirrel's, about six inches in length, with a tail but slightly longer. It is much like a diminutive Tamandua, with a shorter snout, in which the gape of the mouth is more marked. The fur is very close, abundant and soft, of a bright golden-brown, with browner mottlings or lines on the back. The claws on the two fingers are very sharp, one being much enlarged; while the tail is very strongly prehensile, and naked on the under side towards the extremity.

This very pretty little creature is very common in the forest districts, and females with one young one clinging tightly to the fur of the mother, are frequently obtained. Whether the young ones are clinging to the back, side or belly, they are with great difficulty distinguished, the colours blending altogether, and the little bodies are almost completely hidden by the soft fur of the mother.

Unfortunately, in spite of all care and precaution, they pine away in confinement, refusing every kind of food in any regular way; and they survive but for a week or so. Towards evening they become restless and active, but during the day they remain quietly at rest, their tails curved around some support, and the two hands generally gathered over the face. If disturbed they strike suddenly, and with force, forwards

and downwards with both hands, and from the sharpness of the claws they are able to inflict quite painful wounds in spite of their small size.

VIII.—Opossums *(Marsupialia.)*

The opossums or pouch-bearing mammals in the colony, pass under the general names of "yawarries" or "yawarri-rats." They are especially peculiar as being the only members of the kangaroo order of mammals not found in the Australian district, being entirely confined to the American continent, though fossil forms are known from Europe.

The absence in this order of a placenta, which is the nourishing membrane for the young in the higher mammals before birth, leads to the young being born in a very imperfectly developed condition, and the peculiar abdominal pouch which has given the name to this group of animals, is of great importance in protecting and supporting the young in the early stages after they have been attached to the nipples. The opossums present the most extreme condition in the gradual reduction of this organ, the pouch being either only slightly indicated by a fold of skin, or quite absent in the generality of species.

In general shape, they are rat-like, varying in size from that of a small mouse to that of a large cat, according to the species in question. The dentition is quite

different from either the rodent or carnivorous type, however, and is distinctive, owing to the larger number of teeth, both anterior and posterior, and this will serve at a glance to identify them.

About eight or nine species occur in the colony, distributed over the forest and savannah lands generally. They are omnivorous, and chiefly nocturnal creatures, and in the inhabited districts do a considerable amount of damage both to poultry and fruit, which they prefer.

The largest form, the common yawarri, *Didelphys marsupialis*, ranges from the United States to S. Brazil, presenting certain modifications in different parts which have led to a variety of names, such as Virginian opossum, crab-eating opossum, Azara's opossum, etc. They are about the size of a cat, with a long, very prehensile tail, which is kept coiled around any possible object within reach. The colour is a mixture of black and white, altogether irregularly distributed, and it is this variability in markings which has led to the large number of names which have been given to the species. The fur is peculiar, and will readily distinguish it from all others. Long, loose, bristly hairs are found, especially along the back, scattered irregularly among an abundant, soft under-fur, and even in young forms this is sufficiently marked to separate them from the adults of the smaller species.

The pouch in this yawarri is but a small bag, and the young are obliged at an early age to leave it and hang on to the long hair of the mother, their tails clasped around her tail, as is so characteristic in the smaller forms of the group. A peculiarly unpleasant smell is noticed in connection with the local forms, and this becomes absolutely nauseating in the females with young in the pouch. In spite of this, the flesh is eaten by many of the peasantry; and in some other countries, the opossum bears a high reputation for the sweetness and delicacy of its flesh.

This large form is a great pest to the poultry yards, even in the towns, where among the outhouses and sheds it finds abundant opportunities for hiding. They are very tenacious of life, and recover from blows that would be sufficient to destroy considerably larger animals.

Four smaller greyish-brown species, which are about the size and shape of a very large rat, will occasionally be met with in the cane fields and cleared lands, where they are more easily detected than in the forests and grassy wastes. Two of them bear white blotches on the face above the eyes. In the one, the common white-faced opossum or "quica," *Didelphys opossum*, the white blotches are large and very distinct against the surrounding blackish tint, the pouch is present though reduced, and the tail is hairy for about a couple inches at the root. In the other, or bare-tailed opos-

sum, *Didelphys nudicaudata*, the white blotches are small, and the general colour of the body is much yellower and ruddier, while the pouch is absent, and the tail is very long and only hairy for about an inch at the root. This form is not often met with.

Of the two unblotched species, one, the thick-tailed opossum, *Didelphys crassicaudata*, is somewhat smaller, the tail being peculiarly thick, and hairy for more than half its length. The pouch, too, is quite absent, and the fur over the body is straight, thick and soft.

In the fourth form, our woolly opossum, *Didelphys philander*, the fur is particularly woolly, thick and soft; the face is marked by brown rings around the eyes, and a brown streak between them down the centre; the pouch is represented by lateral folds, and the tail is very long, and only hairy for about a couple inches at the root. This appears to be the rarest of the four.

Another well-marked species, which is but little larger than the common mouse, is the mouse opossum, *Didelphys murina*, also known as Merian's opossum after the original describer, Madame Merian, who sketched it in her book on the insects of Surinam, with a litter of young ones on the back of the mother, their tails all coiled around that of the parent to whose fur they cling by their hands and feet. As the pouch is quite absent, this position is the normal one after the young are sufficiently developed to leave the nipple. The species will

easily be recognised by its size. The colour of the body is a rufous grey; and the appearance of the face is rendered striking by a dark blotch passing through each eye. This is a common species among fruit trees generally, the banana and plantain trees being its favourite haunt. It is often met with also in the thatch of the houses in the Indian settlements, more especially in the open houses that are little used.

A curious little species occasionally met with, is the red-sided opossum, *Didelphys brevicaudata*, which is about the size of a small rat, but differing from all the other opossums by its very short tail, of hardly half the length of the body. The colour is rufous above and on the sides, and greyish-white below—the middle of the back being sometimes grey.

This species, too, appears to frequent the plantations, though it seems to be very rarely obtained.

The last of the mammals to be recorded is the water opossum or yapock, *Chironectes minimus*. This creature differs from the ordinary rat-like opossums in its aquatic habit, and in having the toes of its hind-feet webbed. The colour is greyish, mottled with brown. The pouch is also well-developed.

This marsupial has never been met with by the writer in any part of the colony. It is certainly known from the Guianas, and has been recorded from the colony by Schomburgk. It appears to be very rare, but it is

possible that it is really common, and that owing to its small size and its aquatic habit, there may not be frequent opportunities for securing it.

CHAPTER II.

Birds.

The birds present, without doubt, the most characteristic feature of the animal life of the colony, and considering the very large number of different kinds (more than 800 species), it is out of the question to treat of them here in anything like the detailed manner used for the mammals generally. Very many species, moreover, are quite unknown in the inhabited areas of the coast, being met with only on the great savannahs of the interior, or in the high forests, while highly interesting forms are confined entirely to the more elevated tracts, and especially to the Roraima district where the climate is by no means tropical. The more commonly occurring types will, therefore, be chiefly referred to.

As in the case of the mammals, very many families of the most typical forms of the Old World are altogether unrepresented here. Correspondingly whole families are met with that do not occur outside tropical America, or that range only to the Southern parts of the United States, where they are but barely represented; and it is noteworthy that many of the families thus confined to the district are remarkable for the

large numbers of species, and in fact include the great bulk of the birds.

The tyrant-shrikes, the hangnests, the tanagers and the humming-birds, may be taken as illustrative families to be met with everywhere; while others, such as the toucans, the cotingas, and the ant-thrushes and spine-tailed creepers, if more restricted in their range on the coast lands, are equally characteristic of the forested parts.

Many of our most interesting forms, however, belong either to quite small families or are altogether unique. The maams, the barbets, the jacamars, the trogons, and the game birds like the powis and maroodi, may be taken as illustrations of the former, while under the latter come such birds as the trumpeter, the mahooka, the sun-bird, the hootoo and the hoatzin—the last, indeed, from its reptilian affinities, being more peculiar than any other existing species.

As is well-known, many of our birds are among the most beautiful in the world, their brilliancy of colour being unsurpassed by those of any other country. The family groups of the chatterers (cotingas), the tanagers and the humming-birds, at once occur to the mind, but these include a comparative few out of the numbers that would claim notice. A peculiarity of colour-change, though it can hardly be included under brilliance of display, may perhaps be here mentioned—viz., the

colour-change from green to yellow so frequently met with in domesticated parrots, and apparently due to food conditions, and the colour-change from purple to red in the purple-tinted cotingas, which is produced directly by artificial heat. These colour-changes are particularly interesting as indicating a method of modification or variation of colour which may possibly be at work under general conditions to a greater or less degree according to changes in the environment.

It is a peculiarity of distribution that the groups to which the generality of the birds of song belong, are barely, if at all, represented in tropical America, and this accounts for the extreme paucity of singing birds in the colony. The local thrushes, wrens and finches, it is true, do no disgrace to their northern allies, while many of the tanagers, wood warblers and hangnests, are noted for sweet and mellow notes, though seldom long sustained; but altogether they are by no means comparable to the true songsters. What is lacking in sweetness, however, is fully made up for in loudness and peculiarity of tone, as the persistent kiskadee or common tyrant shrike well exemplifies; and indeed in the forest districts, the macaws, parrots, toucans, bultatas, and the calf bird and other loud-voiced cotingas, at times produce a depth and variety of sound that, but for the deadening influence of the forest, would be in the highest degree harsh and discordant.

With regard to the names in common use for many species, it must be mentioned that in but few cases are they really distinctive. The thrushes and wrens are typical of their group, it being understood that they are native species and not the common Old World forms—for though the English thrush was introduced into the colony some years ago, it certainly has not survived. The robins, canaries and mocking birds are not only different from the outside birds, so called, but do not even belong to the same families; while in a very large proportion of cases, there are either no common names at all, or they refer to several distinct species with similar colours or habits. Names like kiskadee, chicken-hawk, grass-birds, are of this nature, and the list may be extended to include a large number of others.

The group of birds more than any other excites the interest of the traveller, and furnishes the most obvious and obtrusive pictures of the luxuriance of tropical life. At certain times and in certain frequented parts, one may get glimpses of great flights of the scarlet ibis, or of the brilliant macaws, or of the more sober-hued herons, whose white wings flashing in the bright sunlight, like the gleaming sails of a ship at sea, present by no means less beautiful pictures. Except in such occasional massed flights, however, the brilliance of individual forms is lost, and in the heights of the forest

trees, the eye is quite unable to distinguish the great proportion of species, though their cries may at once reveal their identity.

Varied as may be the tints of individual birds, it is a surprising experience to find how almost indistinguishable they become among the surrounding vegetation; in fact, the grey tints blending with the dull light of the forest shelter, and the green with that of the foliage, are altogether invisible, the outline of the body alone, thrown on some slightly different background, betraying the presence of the bird. It must be remembered, too, that the picture of the bird in one's mind is generally one in which all its varied colours are at once perceivable, while, as a fact, in nature these are only perceivable through changes in position.

The migration of birds offers in the colony an interesting field of study. Local migration due to the abundance of food through the ripening of fruit or of grain in different places at special times, causes a flocking together of vast numbers of many species, just as in the breeding season certain forms congregate by hundreds or thousands in special places, it may be in the almost impenetrable swamps or among almost inaccessible mountains. General migration, too, from the temperate climes during the late summer and early autumn, brings a large number of different birds to the colony, of which the greater proportion, like the plover,

entirely disappear during the other parts of the year, while others like the summer yellow-bird, though largely increased in numbers by migration during the winter, yet remain scattered over the country throughout the summer. Our knowledge of the general question in relation to the colony, is, however, very far from complete.

Owing to the very great number of forms in the class of Birds, and their almost infinite variety, it was but to be expected that many systems of classification should have been proposed, and that these various systems should differ according to the dominant characters selected in each system. In the description of our local forms, simplicity of grouping is mainly sought after, so far as it is consistent with accuracy. The classification of Birds, as in the case of Insects, is indeed a study in itself, and any one desiring special information on this subject, should consult the work of specialists. The main orders, however, are generally recognised.

Order I.—*Passeres* or *Perching-birds.*

The commonest of our birds belong to the great order of the Passeres or Perching birds, which includes more than half the known species throughout the world. They will readily be recognised by their simple feet, having three free toes in front and one behind, the latter bearing the longest claw of the four.

From the structure of the voice organs, this group is

sharply divisible into two sections, that of the birds of song, and that of the songless birds, the former of which, as already stated, is found chiefly in the Old World, while the latter is distinctively tropical American.

Section I.—*Song-birds* (thrushes, finches, etc.)

Of the section of the Song birds or Acromyodian Passeres, very many representatives of many families occur, and for convenience of reference they may be distinguished as the thrush-like and finch-like forms according to the nature of the wing. In the former, or Turdiformes, the wing bears ten primary quill feathers, the first of which is always much reduced in size; while in the latter, or Fringilliformes, there are only nine primary quill feathers, the first being very long.

Many of our representatives of the song birds are often kept in cages for their sweet song or whistling, and the local range of these forms may perhaps be more easily understood by mentioning the mocking-thrush or "parula," the Tanagrine "canary" or Louis d'or *(Euphonia)*, the black finch or "twa-twa" and the other grass finches or "grass-birds," and the various Icterine forms, such as the troupial, the lazy-bird and the cadoorie.

Thrush-like birds.

Of the thrush-like forms, the true thrushes at once

call for notice. More than a dozen different species, generally of a greyish brown colour, are known from the colony, the greater number of which belong to the temperate range of the Roraima district, where the most peculiar is perhaps the nearly black thrush, *Turdus roraimæ*. Three species occur commonly in or around the towns and villages, and on the low lands generally: namely, the white-throated, the white-bellied and the Sabian thrush. The white-throated thrush, *T. phæopygus*, is the smallest and commonest of all our species, and will be readily known by its pure white patch on the brown-spotted throat. The white-bellied form, *T. albiventris*, is larger, and is destitute of the white patch on the spotted throat; while the Sabian thrush is of a yellowish-brown, darker above and paler below, passing into white in the middle of the body.

In all parts of the town where vegetation gives sufficient encouragement and shelter, but more especially in the larger gardens, and on the outskirts, the melodious notes of the thrushes are to be heard. The notes are full and mellow, but by no means as varied or long sustained as those of the common European music thrush, for which our species are so often mistaken, and which, though it was introduced into the colony some years ago, has certainly not survived. In this relation one cannot help wondering what would be the fate of the hardy sparrow, if it were let loose here among so

many dominant carnivorous species. Wherever else it has been introduced, as for instance in the United States, it has become perhaps the most destructive pest to vegetation, and seeing how destructive and prolific the little creature is, it is perhaps just as well that no colonist has ever thought of introducing it into the local fauna.

Closely related to the true thrushes are two babbling or mocking thrushes, which, while they possess the typical long and slender and somewhat depressed beak, yet are distinguished by their shorter wings and longer tail, the latter being tipped with white, increasing towards the outer feathers. One of these, the parula, *Mimus gilvus*, is only found on the interior savannahs, and high open lands, where they are often seen, tame, about the Indian settlements. The parula is somewhat larger than the common thrush, and is altogether of a grayer or whiter tint.

The other species, *Donacobius atricapillus*, commonly known as fantail, pompadour, and ground-powis, is a smaller bird, dark above and yellowish below, passing into white, especially on the fan-like tail. They are very common on the open coast lands, especially in the low bushes by grassy creeks; and their notes, though little varied, are very sweet.

To be grouped near these forms are the little gnat-catchers, *Polioptila buffoni*, which are much like very

diminutive bluish-grey mocking thrushes, of about four inches in length, with slender pointed and slightly-hooked beaks. They are active and sprightly little birds, found among the bushes in the swamps and along the creeks and rivers, but they are not often secured.

Of all our birds, perhaps the little house wrens appeal most strongly to the affections of the visitor or colonist from the northern climes. Altogether fearlessly they enter the open galleries of the houses, springing and jumping about on the window-sills and jalousies, all the while twittering and warbling their loud and long-sustained melodious notes, which seem so out of all proportion to their tiny size of body. Cheering and enlivening as they are, no wonder they have been dubbed "God-birds."

These little birds, *Troglodytes furvus*, are about 4 inches in length, of a dull ruddy-brown above and pale below, with wings and tail closely barred with dark brown. As in the wrens generally, the wings and tail are characteristically short, the bill is thin, rather long and slender, and the legs are comparatively long and strong.

The house wrens are found commonly throughout the towns and settlements, in and about the dwelling-houses, out-houses or gardens, always sprightly and busily engaged, hunting for food, building their nests or carolling. They certainly build their nests in the most odd

situations, inside the galleries and bedrooms of dwelling-houses, and even among the stock of the larger stores, to which the open nature of the houses gives them easy access. The beams, rafters and eaves, are also favourite situations, though old flower-pots and pipes, calabashes and any convenient vessel where they are undisturbed, serve their purposes equally well. Any nook or cranny to be reached only by a tiny hole through which they are barely able to pass, is a favourite building-place, and the reason is not far to seek seeing they are the victims of the parasitic habits of the larger Icterine cow-birds, known locally as the lazy-birds.

Unlike the cuckoos of the Old World, which make victims of smaller birds such as the wag-tails, to rear their young, the American cuckoos mate and nest dutifully; but it is curious that similar parasitic habits are found in the New World in quite a different family and order of birds, as in the Icterine lazy-birds (*Molothrus*), which lay their eggs in the nests of the wrens, leaving them to be hatched out and their large chicks reared by the little foster-parents. And truly, the anxiety and hurry of the little birds to procure a sufficiency of food for the voracious foster-chicks, is painful to witness, the amount that would be sufficient to satisfy their own chicks but exciting the appetite of the larger birds. As the eggs of the lazy-birds hatch out before those of the wren, the young of the latter necessarily perish. The

lazy-birds will frequently be noticed spying out the building operations of the wrens, and waiting their opportunity to take advantage of them.

Another common wren which will often be met with, is the black-faced species, *Thryothorus coraya*. This is a larger bird than the house wren, and about an inch longer. It is much more distinctly barred, and darker, and the cheeks and side face are black.

In the interior of the colony, more especially in the highlands of the Roraima district, many rare species are to be found, but they are but little known. A form that frequents the forest districts, however, deserves mention. This is the music wren or quadrille-bird, *Cyphorhinus musicus*, which will at times be heard whistling up and down the scales as though it were almost a practised player. It is certainly a surprise to any one who hears it for the first time, and it is difficult to disabuse the mind of the idea that some good whistler is performing among the trees. The little bird will readily be recognised as a wren, with a highly ridged beak, and with elongated white blotches around the neck.

Next to the wrens, mention must be made of some interesting little birds, the greenlets *(Vireonidæ)*, which, while they differ markedly from the greater number of the local thrush-like forms in their thicker and stronger beaks, the upper mandible being distinctly notched and

hooked, must yet be classed with them. Their affinity indeed is closest to the true shrikes, which they represent in our fauna. They are strictly American, and the northern forms are migratory.

These little birds are about from five to six inches in length, and of a very delicate yellowish green and gray colour, which, with the characters of the wings and beak, will serve readily to distinguish them. They are plentifully distributed throughout the forest districts and especially in the high lands of the interior, a few forms such as the common greenlet, *Vireo agilis*, approaching the coast. It is noteworthy that the largest species of this family, *Cyclorhis guianensis*, somewhat more than six inches in length and with bright yellow under-wing coverts, is one of the four kinds of birds known to occur on the summit plateau of Roraima (8,750 ft.)

Before passing on to the finch-like birds, it should be noted that two species of that typical family of the Old World, the crows and jays, occur in the colony. No true crow is found in any part of South America, but the jays are well-known, though, as was to be expected, the species are different from the outside forms. The South American blue jay, *Cyanocorax cayana*, and the hyacinthine jay, *C. violacea*, are met with in the forest districts of the colony, the latter, which is the larger and about fifteen inches in length, being much the more common. The colour is of a very delicate violet and white tint, ex-

quisitely sheeny, and this with the pronounced corvine beak, thick, strong and pointed, with the chin angle far in front the site of the nostril, will easily serve to separate them from all other forms.

Finch-like birds.

Under this group fall many of the most typical American birds, such as the tanagers, the hang-nests, the sugar-birds or American creepers, and the American warblers, besides native forms of the true finches and the swallows.

A unique representative of the family of the wagtails and the pipits first, however, claims notice. This little bird, the ruddy pipit or tit-lark, *Anthus rufus*, is about four inches in length, and of a ruddy brown colour above slashed with darker brown, and paler below.

The pipits pass here under the common name of grass-birds, like all the small finches, and are to be found all over the grassy wastes, especially where, on sandy or rocky ground, the grass is short and sparse. They will at once be recognised by their thin beaks and their lark-like habit of rising suddenly, singing, up and up into the air, though this is never very long-sustained, for they shoot down quite as suddenly, obliquely, into the grassy clumps, and it is as difficult to find them there as to cause them to rise.

A peculiarity will be noticed in the wings of these

birds, for the innermost secondary quills are very elongated, almost approaching the long primaries.

The American warblers, *Mniotiltidæ*, are altogether confined to the New World where they replace the nightingale and other true warblers of the Old World, though there is no comparison in their proficiency in song. Comparatively few belong to tropical America, and of these the greater number are found, as in the case of the thrushes, wrens and greenlets, in the elevated Roraima districts. Some of these so closely resemble the tyrant-shrikes in their broadened depressed beak and abundant bristles around the mouth, that until the structure of the voice organs was known, they were classed with them.

The commonest of the American warblers in the colony, to be met with both on the coast lands and in the far interior, is the species locally called "canary," the migratory summer yellow-bird or golden warbler of the United States, *Dendræca æstiva*. These little birds are normal residents with us, but their numbers are largely increased by migration during the later months of the year, when they will be found plentifully, even among the gardens in the towns. They are small birds, of about four inches in length, with small thin beaks. Their colour is a rich yellow, almost orange, in the adult males, delicately streaked with rusty-brown; in the females and young males, the colour is duller, pass-

ing into olive-yellow. They will readily be recognised by their colour among all our other birds.

The sugar-birds, honey-suckers or American creepers, are members of another family, *Cœrebidæ*, which is also confined to the New World. They are closely allied to the American warblers, but the bill is generally longer, more slender and curved, and the tongue is uniformly bifid and brush-like. They will easily be distinguished from the true creepers of the Old World by the characters of the tongue, and by the fact that the tail is not spiny but soft and square. They are mostly of brilliant plumage.

The commonest of these birds is the little flower-pecker, *Certhiola chloropyga*, known variously as bastard canary and pipitoorie, on account of its note, though the same name is applied to a tiny tyrant-strike of much the same colour. It is smaller even than the house wren, with a long, slender, sharp and curved beak, and of a prevailing blackish-grey and yellow plumage, with a white stripe over the eye. It is very common among the fruit trees of the towns, and in fact is to be met with in all parts of the colony.

The most striking members of the family, however, are two deep blue species of *Cœreba* which will be met with throughout the forest districts. In one, *C. cœrulea*, the throat, wings and tail, are black, while in the other, *C. cyanea*, the top of the head is of a very delicate pale

blue, and the inner edges of the wings are bright yellow. They are about the same size as the common Certhiola, but the beaks are even thinner and longer, and in general appearance they are not unlike humming-birds. These birds have sweet and piercing notes, and they will often be heard on the top of some high tree, where the colour of their plumage cannot even be distinguished.

Somewhat larger than these blue sugar-birds, and to be met with in similar situations, are the green flower-peckers, *Chlorophanes spiza*, which, with the exception of the black head, are of a brilliant grass-green colour. Two species of Dacnis, of a bright blue colour, also occur, the common blue creeper with a black gorget and neck, *D. cayana*, being very common, while the black-headed blue creeper, *D. melanotis*, is only seldom seen. They will readily be known from all the other sugar birds by the much shorter and thicker beak, in which they approach the warblers.

The most interesting member of this group, however, may be said to be the great, hooked-billed form, *Diglossa major*, found only in the Roraima district, and one of the four known birds occurring on the summit of that peculiar plateau. The length of this bird is about six inches, and the beak is long, strong, and hooked. The plumage is of a deep bluish ashy colour, the under coverts of the tail being ruddy-brown.

This bird is the commonest of the four species which

are found on the top of Roraima, and it is met with frequently where the vegetation becomes at all abundant, as in the more sheltered valleys and the sides of the ridges protected from the prevailing cold winds. The large greenlet, the ruddy-breasted sabre-wing hummingbird, and the pileated finch, which are also found on the top of Roraima, are much less common.

Some of the commonest and most obtrusive of our birds are the swallows, various forms of which will be met with about the settlements and other parts of the coast, and along the great rivers and small streams of the interior, both in the forest districts and the open savannahs.

A few species occur plentifully along the upper reaches of the rivers, and especially in the elevated Roraima region, where the rarer migratory specimens chiefly are found; but the greater number of species frequent the immediate vicinity of the town. Here they will be seen in their graceful sweeping flight about the pond at Longden Park, and the lakes of the Botanic Gardens, and among the shipping in the harbour. The martins particularly seem to be the greatest perchers, and they are generally to be noticed on the masts of the ships, on the telegraph posts and lines, on the bare boughs of lofty trees, or on the roofs of the houses, even in the centre of the town, where they frequently make their nests on any projecting ledges well out of reach, and generally away from observation.

The commonest of all in the town is certainly the white-breasted purple martin, *Progne chalybea*, which is about 6½ inches in length, with the upper surface in the males of a deep purple colour, less so in the females and young males, passing into white on the under surface.

These martins, like the swallows generally, are bold and fearless little things, domineering even over the pugnacious tyrant-strikes or kiskadees, and over the large vultures and hawks, which they often pursue for long distances, darting at them at will owing to greater power of flight, and making their life miserable though seldom actually touching them. They seem to frequent specially houses of great elevation or isolation where they are less disturbed, and about these they are found plentifully, chattering and quarrelling, more particularly at nesting time. They are always to be seen about the river; and generally before heavy rain, especially when there is a high wind, they will be observed in considerable numbers, circling high overhead against the gloomy sky.

For many years the high East gable-end of the Museum offered a convenient and regularly utilised position for the nesting of a large family of these martins. A small opening at the top of the gable-end led on to a large rafter which afforded the site for the nests, but as this opening also gave a means of ingress and egress for

many bats, it was eventually closed up. At this time several martins were nesting in separate nests, closely placed together, and about a dozen eggs were obtained, though many were too far incubated to be retained. A large quantity of small twigs, broken leaves and pieces of grass, was found collected on this rafter, which no doubt had been brought together during the course of years; and a portion of the material, with some of the eggs, is preserved in the Museum collection. Until the time of the closing up of this aperture, the martins had always made a favourite gathering place of the East end of the roof, and even now, some years after, birds often perch there, though comparatively few at a time.

The broad, thickened and much shortened beak, together with the long, pointed wings, and weak, shortened feet, will readily distinguish this and the other swallows from all the other finch-like Passeres. Superficially they recall the swifts, but as will be seen later the structural features of the two groups are very different, and while on the one hand, they relate the swallows to the finch-like Passeres, on the other they relate the swifts to the humming-birds.

Throughout the colony generally, the brown martin, *Progne tapera*, is the most widely distributed form. In size these birds are about the same as the white-breasted purple martin, but the colour above is of a pale brown, not purple. In habits they much resemble the former

species, though they will frequently be seen congregated together in flocks or flights of several hundreds on the widely-extended and barren boughs of some old and decayed giant tree. Small flights of them will, however, be often met with.

Another form to be met with occasionally is the rare purple martin, *Progne purpurea*, which is about an inch longer than the other two species and proportionately thicker, and of a pure purple throughout. This species is a migrant in the colony, and is but little known.

A common species in the town and along the rivers generally, is the violet and blue swallow, *Tachycineta albiventris*. This is a small species, less than five inches in length, of a glossy violet or coppery and steely blue above except on the white-edged wings and rump, and of a pure white below. The colours in the females and young males are much paler and duller, and show but little of the brilliant iridescence of the full-plumaged males. These birds will often be seen about the ponds and lakes of Longden Park and the Botanic Gardens and on the river, where they dart over the surface of the water, skimming it with almost lightning-like rapidity.

Another common form is the rough-winged swallow, *Stelgidopteryx ruficollis*, which will at once be known among all others by the stiff bristly edge of the first quill in the males, from which its name is taken, and which

gives a rough and serrated feeling when stroked backwards. It is about the same size as the violet and blue swallow, and is even more rapid in flight, darting about much like a bat when seen overhead. The colour is of a dull brown above, passing into yellowish-white below, the throat being distinctly chestnut-red.

Two species of forked-tailed swallows will be met with in all the rivers of the colony, where they are seen darting along over the surface of the water, circling and sweeping backwards and forwards, or upwards and downwards, or perching on the bare sticks, branches and rocks in or close to the water. In the one, the white-banded swallow, *Atticora fasciata*, which is about six inches in length, the colour is of a glossy blue-black above and below, the breast being crossed by a broad band of white. In the other, which is much smaller, the white-bellied forked-tailed swallow, *A melanoleuca*, the colour above is duller, and the under surface is white but for a band of black extending across the lower throat and upper breast. Both these species have the tail deeply forked, and the body is much thinner than in the other swallows.

A somewhat common migrant from the North in the winter months, is the red-bellied barn swallow, *Hirundo erythrogaster*. This bird is nearly 7 inches in length, of a purplish blue above, and with the chest and hinder parts of a chestnut red, paler in front. The feathers of

the tail are nearly all blotched with a white spot, increasing in size and length on the elongated outer tail feathers.

This species occurs commonly on the coast, but is also known from the interior, where the common bank swallow, *Cotile furcata*, also dwells, in the neighbourhood of Roraima. This is the smallest of our forms, and will be at once recognised by its pale greyish-brown colour above, passing into white below.

Among the commonest, and at the same time the most beautiful of our birds, the tanagers (*Tanagridæ*) hold a prominent place. There are many different species of this family in the colony, and taking an illustration from the common town forms, they may be grouped about an example such as either the blue, the the palm, the red, or the cashew sackie. From the other finch-like Passeres, they will readily be known by the terminal notch on the upper mandible, though in itself the shape of beak is very variable, ranging in extreme types from a short, broad and thick form re-calling that of a swallow, to the swollen, conical form so characteristic of the true finches.

None of the tanagers reach any considerable size, a length of 7 inches being about a maximum, while on the other hand, several are quite small. A length of about five inches represents a fair average. These birds are scattered all over the coast lands, the forest districts

and the interior savannahs, and a good many species are altogether confined to the elevated Roraima districts.

In colour the tanagers are extremely varied. Some forms are nearly clear black, blue, green, yellow, or red, though combinations of shades of these various tints are more usual—the extreme being reached in that most striking and beautiful species, the rainbow tanager, *Calliste tatao*. Owing to their brilliant colouring, many of the tanagers are favourites as cage birds, but they are, as a rule, deficient in song, their notes being by no means sustained though sweet. In fact the louis-d'ors *(Euphonia)* or canaries, as they are often called, are the only members which clearly justify their title as song-birds.

Perhaps the most peculiar species included in this family is the broad-billed tanager, *Procnias tersa*. This form is about six inches in length, of a pale blue colour above in the males, passing into white on the belly, and black on the throat and sides of the face; while the females are bright green, with transverse yellow bands below. The beak is most distinctive, being very broad, short and thickened, the width of the gape much like that of the Cotinga group of the songless birds, though in other respects it is like a greatly exaggerated swallow's beak.

These birds do not seem to occur on the coast, and

indeed they are seldom found in collections made in the low-lying districts.

The louis-d'ors or Euphonias will be recognised by their small size, their short thickened beaks and their short tails. The males are especially brilliant in rich shades of blue, yellow and purplish-black, while the females are generally of an olive-green tint. The various species range from the coast, through the forest districts, up to the elevated plateaux; and though they are not often obtained, this is due not so much to their scarcity as to the difficulty of detecting them among the dense vegetation, where through their small size they are comparatively secure. The best chance is certainly during the heavy fruiting season when the little birds frequent the trees in large numbers in search of the fruit. In spite of considerable differences in colour, they all pass under the general name of canary or bastard canary, and as a fact they are very similar in their habits, being sprightly little creatures.

Some eight or more species are found in the colony, four of which are much more common than the others, or at least appear to be so near the coast. In the lead-coloured Euphonia, *E. plumbea*, of about $3\frac{1}{4}$ inches in length, the colour above throughout and on the throat, is a clear greenish lead tint, while the belly is golden yellow. In the blue Euphonia, *E. cayana*, of about 4 inches in length, the general tint is a deep shining

blue-black, with the exception of two yellow patches, one on each side of the breast. In the violet Euphonia, *E. violacea*, of about $3\frac{1}{2}$ inches in length, the colour above is a violaceous blue, the top of the head, or cap, being yellow like the whole under surface. In the tiny Euphonia, *E. minuta*, of about $3\frac{1}{4}$ inches in length, the upper surface is of a glossy greenish and purplish black, with yellow front, while the under surface is yellow, replaced by black on the throat, and white on the belly.

Of the four less known species, the black-necked Euphonia, *E. nigricollis*, of about $4\frac{1}{2}$ inches in length, appears to be the commonest on the coast. The general colour is a purplish-black passing into pure black on the throat, the hind-back and the belly being yellow, and the cap and nape blue. This latter feature sharply distinguishes this species from all our other forms.

The other three bear a great general resemblance to each other. The throat and upper surface are of a deep purplish-black, and the top of the head and the belly are yellow or orange, but while in the orange Euphonia, *E. xanthogastra*, the whole top of the head is orange, in the yellow Euphonia, *E. chlorotica* and Finsch's Euphonia, *E. finschi*, only the front is coloured. The last named will at once be known by its deep reddish-orange tint and black tail, while the yellow species is of a pure sulphur-yellow, with white blotches on the outer tail-feathers.

Closely related to the foregoing forms is a lovely little bird, resplendent in green, blue and yellow, which is known only from Roraima. This is the green Euphonia, *Chlorophonia roraimæ*. The general tint is a bright green; the top of the head and the belly are yellow, and a collar round the neck and the lower back are blue. In size this form reaches a length of about $4\frac{1}{2}$ inches.

The members of the genus Calliste closely resemble the Euphonias, but the beak is somewhat thinner and longer, and the tails and legs are longer. They include some of the very handsomest members of the tanagers, as the name indicates, and about 14 different species occur in the colony, though many are only known from the elevated lands. The common species will be met with in the high forest trees along the creeks and rivers, more especially in the open places; and their notes are rich and strong though jerky and short.

The rainbow tanager, *Calliste tatao*, the most beautiful example of the genus, is a rare bird near the coast, but is common on the interior high lands. It is about $4\frac{1}{2}$ inches in length, of a velvety black colour above, with a green cap on the head, and a bright scarlet rump, passing into deep yellow towards the tail. Below it is bright blue, deepening to purple on the throat. As in all the other species, the wings and tail are

black or dark, though usually they are marked along the edges by the prevailing body colour.

The skin of this species is frequently seen attached with the skins of the bright cotingas, cock-of-the-rocks, sugar-birds and bill-birds, as one of the pendents to the teeth necklaces of the savannah Indians, but unfortunately the birds have never been met with in confinement.

The green Calliste, *C. gyrola,* is perhaps the commonest species in the low lands. It will at once be recognised by its bright green colour, the head alone being of a chestnut red.

Almost as common in the same places, is the spotted green Calliste, *C. punctata,* which has the green upper surface spotted with black, with white feathers about the eyes, and a whitish under surface, more or less spotted with black.

It is interesting to note that there is another very similar species clearly distinguishable from the last by the feathers about the eyes and front being rich yellow. This is *C. guttata* of the Roraima district. It is also a slightly larger bird, being about half an inch longer; but except for the fact that the common species occurs distinctly marked in the same districts, one would be inclined to regard them merely as two varieties of the same form, one confined to the lowlands, and the other to the mountainous districts.

A third species, a somewhat smaller bird, only slightly

more than 4 inches in length, closely approaches the foregoing two. This is the yellow-bellied Calliste, *C. xanthogastra*, also from Roraima. The general tint on the under surface is here green not white, and the belly is sulphur-yellow. The black spots on the green ground, too, are only slightly marked.

The golden Calliste, *C. aurulenta*, is a well-marked, distinct form. It is about 5 inches in length, of a rich golden or orange colour, the feathers between the wings varied with black, while those behind the nostrils, as well as those over the ears and a small chin mark, are pure black.

This beautiful species appears also to be a rare form, as it is only known in the colony from the Upper Mazaruni River.

Another well-marked but uncommon form is the yellow Calliste, *C. flava*, which is of a pure yellow, except on the sides of the head, the chin, throat, breast and middle belly, where it is black.

This is the largest Calliste in the colony, its length reaching to more than $5\frac{1}{2}$ inches.

Two greenish or yellowish species with rufous caps, will readily be recognised. In the one, *Calliste vitriolina*, the greenish grey colour is bright and glossy, though much paler on the under surface, while in the other, *C. cayana*, the yellow predominates, the throat and neck being of a dark glossy bluish.

Both these forms are common on the elevated lands in the neighbourhood of Roraima. They do not appear to range to the coast.

Three variegated black and blue species are also obtainable. Of these the most common is the pale yellow-bellied Calliste, *C. flaviventris*, which will at once be known by its blue rump, throat and wing angle, the belly being pale sulphur-yellow. The black-banded Calliste, *C. nigricincta*, has a black mid-back and breast, the head, neck, throat and rump being lilac-blue, and the belly white; while the blue-necked Calliste proper, *C. cyaneicollis*, differs from it in having a bright green rump, and a black under surface with more or less of a purplish tinge on the throat, flanks and belly.

The three foregoing species are obtainable in the mountainous districts, but the first and last are also found on the coast.

The two remaining species of this genus are both quite rare forms, being only known in the colony from Roraima; but while Whitely's Calliste is confined to this district, the blue-winged Calliste is known also from Venezuela and Colombia. In the former, *C. whitelyi*, the general colour is silvery green, the head and neck all round, and the wings and tail being black. In the blue-winged form, *C. cyanoptera*, on the other hand, the quills of the wings and tail are edged with

blue, the other characters being practically the same. In these two species alone are the females markedly different from the males—their general colour throughout being green, paler, and more or less ashy below, with the quills of the wings and tail edged with green.

Another tanager which closely resembles the foregoing birds, is the blue and black form, known as the red-bellied tanager, *Tanagrella velia*. Tanagrella differs from Calliste only in the thinner and longer beak, the terminal notch being almost entirely obsolete. The one species found in the colony is very beautiful. The colour above is velvety black, the front and sides of the head are blue, and the rump shining silvery-green. Below it is blue, with a black collar on the throat, the middle of the belly being chestnut-red.

This lovely bird is common in all the forested districts from the coast to the far interior, and it is occasionally seen in confinement. Their song is not striking, but the notes are short, lively and sweet.

Of all the tanagers, the blue and the palm sackie may be regarded as the most typical, both belonging to the genus Tanagra from which the family takes its name. They are so commonly distributed over the colony as hardly to need detailed description. In the blue sackie, *T. episcopus*, the length is about 6 inches, and the colour a beautiful pale blue-grey; while in

the palm sackie, *T. palmarum*, the size is somewhat greater, and the colour a pale ashy or olive-green. In habits the two species are very similar. They make open nests and lay spotted eggs; and their diet consists chiefly of fruit and insects. Occasionally they will be met with, the blue sackie especially, in confinement about the settlements of the native Indians, but they do not generally thrive well as cage-birds, nor in fact is there much to recommend them, since their song is of the simplest kind.

The cashew or red sackie, *Rhamphocœlus jacapa*, is even more common than the two preceding, being one of the most widely distributed and abundant birds in the colony. The females are of a dull rusty red, hence the common name "red sackie." The males are of a shiny black above with crimson reflections, and of a deep wine-red below, the under beak being much inflated at the base and of a bright silvery tint, from which the common name of "silver beak," which is frequently applied to them, is taken.

In habits these birds are very similar to the preceding, and like them are often met with in confinement in Indian villages, and as cage-birds in town, though from their song, which is neither varied nor long-sustained, there is little to recommend them. Other common names, such as wasoo, bucktown sackie, etc., are applied to them in different parts of the colony.

Three rare and brilliant red species of Pyranga occur in the Roraima district. They are much about the size of the sackies. Two of them, *P. æstiva* and *P. hæmalea*, are of a scarlet colour throughout, the latter with a distinct tooth on the upper beak and the former without. The third form, *P. ardens*, has the wings and tail black, with white marks on the former. The brilliant colouring of these scarlet tanagers is only found in the males, however, the females being yellowish olive.

Closely related to the above are the black-headed yellow tanagers, *Lanio atricapillus*, in which the hook and tooth on the upper beak are more developed than in any other tanager. They will be recognised by these characters and by their deep orange-yellow and brown colour, passing into black on the head, wings and tail.

This species is very widely distributed in the forest districts throughout the colony both on the coast and in the highlands, and is very seldom met with in the open plains.

Several species of black tanagers of the genus Tachyphonus are known, which vary in size from 5 to 7 inches in length, and are distinguishable from each other by slight differences in colour on the head, wings or back. The greater black tanager, *T. melanoleucus*, is the largest and the most common in the coast districts. It is of a uniform glossy black, the angle of the

wing, the under wing coverts, and some small coverts on the upper part of the wing being white. The female is of a rusty or reddish brown.

The smaller black tanager, *T. luctuosus*, which is the smallest of all, is only distinguishable from the foregoing by its smaller size and the larger patch of white on the upper wing coverts. The female, however, is of a prevailing olive tint.

Another somewhat larger species is the red-winged black tanager, *T. phœniceus*, which is only known in the colony from the elevated lands, particularly from the Roraima district. This is distinguishable from the last by a bright red patch on the bend of the wing in the males, the females being greyish brown, passing into white below.

A very common species on the coast and low lands is the yellow-headed black tanager, *T. surinamus*. In this form the middle feathers of the top of the head are fulvous or golden yellow in the males; the lower back is of the same tint, and the lower part of the flanks is chestnut red. In the females the general colour is olive, becoming paler yellow below.

A somewhat smaller species, the crested black tanager, *T. cristatus*, is distinguished by having a long orange-red crest, and by the absence of the red from the flanks.

All these black tanagers, as well as the red and the

black-headed yellow tanagers, already described, are much more insectivorous in their diet than the other species, though fruit forms also an important part. In correspondence with their habits the bristles at the gape of the mouth are much developed, especially in those which have a large tooth and hook on the upper beak. These teeth are obsolete in the black tanagers, and the beak as a whole is thinner, longer and more curved.

Closely related to the foregoing species is the purple-blue tanager, *Cyanicterus venustus*, which is a rare bird, and only known in the colony from the upper Mazaruni river. The males are of a bright purple-blue, except on the belly which is yellow. In the females, the blue becomes of a greenish tint, and the whole under surface is yellow. These purple-blue tanagers are closely allied to the scarlet tanagers, but the beak is proportionately longer and more incurved. In habits they are no doubt similar.

The black-throated olive tanager, *Nemosia guira*, recalls many of the characters of the black tanagers and also of the members of the genus Calliste already described. The beak is slender, weak and thin, the terminal notch so distinctive of the family is hardly represented, while the bristles at the sides of the gape of the mouth are quite few and weak. The females are of a prevailing yellowish olive-green, which in the

males is marked by a yellow stripe over the eye, and by yellow tints on the sides of the neck, and the base of the tail. The lower back and the breast are reddish orange, and the sides of the head and the neck are black.

Another pale-necked form, *Nemosia flavicollis*, has the upper side blackish, except the lower back which is yellow; and the under side is whitish, the throat and hinder parts being yellow.

These two species are commonly distributed over the elevated districts, especially near Roraima, and but little is known of them otherwise in the colony. In habits they are no doubt similar to the black tanagers, to which they approach so closely in general structure.

The remaining forms of the tanagers to be described so closely resemble the true finches in the thickness and form of beak that but for the terminal notch in the upper mandible, which, however, is often only very slightly represented, they would necessarily be grouped with them. There is here a very good illustration of the difficulties so often met with in the classification of animals, where certain forms possess a combination of characters generally typical of two or more different groups, a state of things that renders the relation of each group to the others a matter of great doubt, and in many cases among individual

naturalists, a mere matter of opinion. Many of the larger groups are thus seen to be merely convenient divisions for the purposes of reference, based on certain main characteristics, examples in each group being almost interchangeable. In the case of the tanagers, we see that they pass gradually into the finches, while, as we have already seen, their affinities with the sugar-birds and the American warblers, are extremely close. Their alliance to the swallows, too, should also be borne in mind.

Of the finch-like tanagers, the tom-pitchers, *Saltator magnus*, and *S. olivascens*, are by far the commonest. These birds are among the largest of the family, being more than 7 inches in length. The former, which is the commoner about town, will readily be known by its olive-green tint above, passing into yellowish-ashy below. The chin is white with a black stripe on each side and there are slight white streaks above the eyes. In the other species, the general tint is ashy, paler below; the superciliaries and throat are white, and the latter is bordered on each side by a large blackish stripe.

These birds frequent the bushes on the open lands much more than they do the high forest, and their favourite haunts are in the neighbourhood of the settlements, provision grounds and orchards, where they are among the most persistent and destructive pests

both to grain and fruit, the latter more particularly. Their cry, from which the common name is taken, is loud, but neither harsh nor discordant, and they often seem to delight in making it while jumping about amongst the branches, where they serve a useful purpose in picking up the insects they can find, thus mitigating to some extent the ill effect caused by their attacks on the fruit cultivation. They are active, sprightly and hardy creatures, and are thus not unfrequently met with in confinement.

In the tom-pitchers, the bill is thick and very strong, though by no means as swollen or broadly conical as in the most typical finches. A closely similar, but smaller form, with weaker beak, is common in the Roraima district. This is the chestnut-headed, finch-like tanager, *Buarremon personatus*, in which the olive-green tint passes into chestnut-red on the head, nape and chin, the under surface being yellow.

Another smaller form, of about $5\frac{1}{2}$ inches in length, is the black-headed, finch-like tanager, *Arremon silens*. The beak is much shorter and more conical. The general colour above is olive-green. The head is black, with white superciliaries and an ashy central stripe, passing into white below, with a black collar on the breast.

This is a very widely distributed species in the colony, being found in the forest all over the coast

lands and the elevated districts of the interior. It is markedly solitary in its habits.

One of the most characteristically marked of the finch-like tanagers is *Cissopis leveriana*. This is a glossy black and white form, with long graduated tail, and which from its general resemblance in colour, is known as the magpie tanager. The general colour is white, except on the head and neck down to the mid-shoulder, and on the throat and breast in a line down on the belly, where it is glossy and black. The wings and tail are also black, though more or less white-spotted, especially on the tips and covering feathers. The eyes are of a gleaming white.

This bird, though it appears to be common in many parts of the forest on the coast and along the rivers, is seldom seen, and in fact is very rarely to be found in the collections of bird-skins made by the licensed taxidermists. On account of its peculiarity of colour and its rarity, it is a much-prized cage bird, but few are ever obtained.

Another somewhat rare form is the black-faced grey tanager, of the genus Schistochlamys *(S. atra)*. The general colour is grey, but the front and sides of the head, and the throat down to the middle breast, are black. Its length is about 7 inches. This species is common on the elevated sandstone districts, and is apparently not found on the coast.

The three remaining tanagers belong to the genus Pitylus, in which the beak is greatly swollen, becoming short and broadly conical, as much so in fact as it is in the most typical finches. The distinct terminal notch with its slight hook places it, however, with the other tanagers, in spite of its finch-like character

The three species will readily be distinguished from each other. In the red-billed, finch-like tanager, *P. grossus*, the general colour is blue-gray, the sides of the head and a band round a white patch on the throat, being black. The bill is bright red.

In the scarlet, finch-like tanager, *P. erythromelas*, the general colour is scarlet, the whole head and throat being black.

In the yellow, finch-like tanager, *P. viridis*, the upper surface is olive-yellow, passing into pure yellow below, a ring round the eye, and the throat, being black.

The three forms are common in the colony, the scarlet species being, however, apparently confined to the more elevated lands of the interior. The others occur from the coast to the far interior, and are very frequently met with along the riverside and in the high forest. The red-billed form is occasionally to be seen in confinement in the Indian settlements, but apart from its grotesquely swollen, red beak, there is nothing to recommend it as a cage-bird.

As will have been seen from the descriptions of the various tanagers, the family presents us with some of the most interesting features of the bird life of the colony, and it can hardly be doubted that further investigation of the fauna of the dense forest and of the far interior, will add a good many more to our number of recorded species.

The family of the finches is represented in the colony by more than twenty species, of which as in nearly all other families, many are only met with in the elevated lands of the far interior. The extreme stoutness of beak so characteristic of the most typical forms, is, as we have seen, also common to many tanagers, and as a fact the absence of the terminal notch in the upper mandible may be taken as the only ready means of distinguishing the finches from the tanagers, though in the weak-billed members of the latter group, even this notching may be lacking or but barely indicated.

To the ordinary visitor or colonist, many of the smaller finches are among the most familiar of our birds, passing under the name of grass-birds owing to their frequenting all open and grassy spaces. Certain forms are prized as cage- birds, but they hardly serve to represent the large assemblage of other species of the family, which in the Old World are such common objects in confinement. We certainly have nothing

to match the true canaries in their richness and delicacy of song, but on the other hand we are spared the depredations of a pest like the sparrow, though considering the peculiarities of our local conditions in the abundance of predaceous creatures of all kinds, it may be doubted whether, if introduced, this almost ubiquitous bird would even survive. It certainly could never attain the dominant position it has taken in the United States and other places in a comparatively short space of time.

One of the best-known and commonest of our finches, is the thick-billed black grosbeak or twa-twa, *Oryzoborus crassirostris*. This species will readily be recognised by the glossy black colour of the males with white feathers on the axils of the wings, the females being olive-brown, passing into yellowish underneath. They reach a length of $5\frac{1}{2}$ inches, and are furnished with the greatly swollen and conical beak of the most typical members of the family.

The twa-twa is met with in all the open grassy lands of the colony where it feeds on all sorts of insects, grain, seeds and fruits, and is particularly abundant in the neighbourhood of the settlements along the coast where they are secured as cage-birds, for which they are greatly prized on account of their hardiness and song.

A second species of the same genus, the so-called

twa-twa slave, *O. torridus*, is also common. This is a slightly smaller bird, differing in colour from the preceding by having the breast and belly of a deep and ruddy chestnut.

Closely related to the foregoing forms is the somewhat larger blue grosbeak, *Guiraca cyanea*, which frequents the forest as well as the bushy plains. Its swollen beak and deep blue colour, brightening on the back, and becoming intense on the front of the head and on the lesser wing patch, will distinguish the male adults from all others. The females and young males are yellowish-brown, becoming paler below, a reddish tint being more or less visible on the upper surface.

It is to the genus Spermophila, however, that the greater number of species of the so-called grass-birds belong. These are small birds varying in length from $3\frac{1}{2}$ to $4\frac{1}{2}$ inches, found plentifully distributed wherever grass lands occur, but as a rule becoming particularly abundant in the immediate vicinity of settlements and towns. The commonest and smallest of all is the chestnut-bellied grass-bird, *S. castaneiventris*, which is of a general blue-grey above, while the throat, breast and belly are deep chestnut. It is a sprightly and active little bird, seldom perching long in one place, but springing incessantly from grassy patch to patch, hiding among the clumps for a time, or

darting swiftly from blade to blade, swinging and chirping in the merriest manner possible. In confinement it is equally active, and from dawn to dusk appears to be always on the go. In many places, especially about the rice fields, hundreds of these little birds will keep in one flight, darting away together in a mad rush when disturbed, with loud and shrill twitterings. As in the other species of Spermophila, the females differ from the males, being more or less olive-brown above and yellowish below.

A somewhat larger species is the chestnut-backed grass-bird, *S. minuta*, which differs from the former in being brown rather than grey above, with the lower back and rump chestnut-coloured, as on the under surface. In habits, this species is similar to the former, but they never seem to be found in such large flocks.

Two larger and less known species are met with particularly on the interior savannahs. In both of these the colour is of a variable ashy-grey above, passing gradually into paler grey and white in the middle of the throat, breast and belly, but while in one, the lead-coloured grass-bird, *S. plumbea*, there is a white streak across the lower chin, in the other or grey grass-bird, *S. grisea*, there is no such streak, the colour there being on the other hand rather darker.

Three black and white species, of about 4 inches in length or more, are very common in all parts of the colony, especially about the cleared lands of the coast. In the white-throated grass-bird, *S. lineata*, the upper surface is greenish-black, with white-spotted wings, the under surface being white, except a band across the fore-neck which is black. The white-spotted grass-bird, *S. ocellata*, differs in having the fore part of the under surface black, the neck being mottled with round white spots, and the cheeks marked with a large white streak. In the white-crowned grass-bird, *S. lineola*, on the other hand, the white spotting on the neck disappears, but the centre of the crown bears a broad, conspicuous white streak from the beak to the back of the head.

One other species of Spermophila, the yellow-bellied grass-bird, *S. gutturalis*, calls for notice. The general colour in this form is dull olive-green, the head, cheeks, throat and neck being black, and the breast and belly bright yellow. This is not a lowland form, having only been recorded up to the present from the interior highlands.

Closely related to the foregoing species both in structure and habits, is the little black grass-bird or jacarini, *Volatinia jacarini*, which is often found mixed up in flights or flocks of various species of Spermophila. These birds are about 4 inches in

length, of a glossy black colour, with white axillaries, so that they may be regarded as a very diminutive presentation of the twa-twa. The beak, however, is much weaker than even in the ordinary grass-birds. This pigmy finch is one of the most widely distributed of the family over tropical America.

Two species which are met with chiefly in the interior savannah lands are interesting as representing the group of the linnets and sparrows. In the one, the black-faced siskin, *Chrysomitris icterica*, the general colour above is olive-yellow, passing into brighter yellow on the lower back, and pure yellow on the under surface, the throat, sides of the face and nape being black with the exception of a yellow collar. In the second form, *Sycalis flaveola*, which passes in the colony under the common name of canary, there is no black on the face, neck or throat, and the feathers of the upper surface are marked with dusky mesial streaks, and in the young stages are brownish or ashy. These are small species, but little more than 4 inches in length, though both in size and colour they are rather variable. Their beaks are much thinner in proportion than in the grosbeaks, the under mandible being slightly bent at an angle and not swollen at the base.

The remaining forms of the family which call for notice, are members of the group of buntings, the beak

being much thinner than in the other finches, and in general size approaching the typical tanagers. The commonest of these are the fall-birds, which are so frequently met with along the rivers, especially in the neighbourhood of rapids and cataracts, and recognisable by their crimson, crested heads. Their general colour above is black, below white. Our two species will readily be distinguished, the black-throated fall-bird, *Paroaria gularis*, having a black throat and fore-neck, and the crimson-throated fall-bird, *P. nigrigenys*, crimson instead of black on the same parts. In length they are both about $6\frac{1}{2}$ inches.

Another crimson-crested finch, *Coryphospingus cristatus*, will readily be recognised. The head is bordered on the front and sides with blackish, passing into ruddy brown on the back, and dull crimson on the rump. Below the body is of a deep but variable crimson. In length these finches are about $5\frac{1}{2}$ inches, being much smaller than the fall-birds, with which they agree in habits and distribution.

The long-tailed finch, *Emberizoides macrurus*, is another very distinctly marked form. The tail feathers are graduated and pointed, the central feathers being longest and occupying more than half the entire length of the bird, which reaches nearly 8 inches. In general colour it is of a striped brown and olive, with black streaks in the centre of the

feathers. The under surface is white with the exception of the neck and chest which are brown.

These birds like the three following forms are but little known, being found in the forests and grassy plateaux of the interior.

The striped bunting *Zonotrichia pileata*, of about 5½ inches in length, will be recognised by the brown upper surface broadly streaked with black, and its white under surface, shaded with ashy; by the black lateral stripes on the head and its white eye-brows, and the chestnut mottling on the sides of the neck and body. The yellow bunting, *Pseudochloris citrina*, is like a thin-billed Sycalis, with white blotches on the outer tail feathers; while the grey bunting, *Ammodromus manimbe*, is slightly smaller than the striped bunting, its grey feathers streaked with black with ruddy edges above, and its grey and white under surface becoming almost yellow on the throat and neck.

An interesting member of the family is a new species of Zonotrichia obtained on the summit and slopes of Mt. Roraima during the McConnell and Quelch Roraima Expedition of 1898. This species, which has not yet been described, will be known as McConnell's bunting, *Z. macconnelli*.

The last family of the Finch-like birds to be considered is that of the Icteridæ or hang-nests, which include many of the commonest forms in the colony,

not only in open nature, but as caged song-birds. The troupial, the cadoorie, the local robins and mocking-birds, are familiar examples, but indeed out of the seventeen representatives of the family, nearly half of them will be met with in all parts of the colony, though the nature of the country, whether forest or plain, must be taken into account for the distribution of individual forms.

The Icterine birds are distinctively American and take the place here of the starlings of the Old World, being very closely related to the finches and the tanagers. They will readily be distinguished from the latter group by the absence of the characteristic tanagrine terminal notch in the upper mandible, and from the former group by the markedly conical, pointed beak, which though in certain species it becomes greatly expanded and elevated at the base, never shows the swollen form so typical of the finches. The beak is rendered still more peculiar by the extension of the base far back in the middle line of the forehead, and this presents a character which may be recognised at a glance.

The largest members of the family which occur in the colony, are the two cassiques known locally as the black and the green bunyahs, of the genus Ostinops. They are rendered peculiar by the greatly elevated and expanded frontal base of the mandible, which thus

becomes shield-shaped or helmet-shaped, to which feature the term cassique refers. They also possess a small occipital crest.

In the black bunyah, *O. decumanus*, the general colour of the body is black, except a small chestnut-coloured patch on the lower back. The two middle feathers of the tail are also black, the others being bright yellow. In the green bunyah, *O. viridis*, on the other hand, the black tints are replaced by olive-green, the lower back and belly being dark chestnut. The two species are much of the same size, the green bunyahs being slightly larger and reaching a length of about 17 inches in the males. The females are some two or three inches shorter in both forms.

These cassiques are typical, sociable hang-nests, their long and purse-shaped nests, often reaching a length of six feet, being suspended from the slender ends of the branches of high trees, frequently hanging over water, and swinging to the slightest breeze. Usually these nests are clustered in large colonies, and not infrequently are more or less united. Those of the black bunyah, which is by far the commoner species, will often be seen on the high trees around settlements and cleared lands, though they will also be met with in the high forest which is the home of the green species.

In the preparation of these and the other larger

hang-nests for cabinet and such like purposes, care should be taken to cause the removal of the outer horny layer of the beak from the pigmented layer underneath, either by insertion in hot water or by exposure to strong direct heat. If this pigmented layer be scraped off, the horny layer when replaced will keep its colour in drying—otherwise it appears to turn black or dirty-coloured, owing to the drying of the pigment underneath.

Two smaller cassiques, of the genus Cassicus, in which the frontal shield is much less developed though quite distinct, pass under the common names of yellow-backed and red-backed mocking-birds. In both of these birds the general colour is glossy-black, but while in the red-backed mocking-bird, *C. affinis*, the lower back is bright scarlet, in the yellow-backed form, *C. persicus*, a patch on the wings, the lower back and the basal half of the tail, are bright yellow. The latter species, too, is somewhat larger, the males being about 11 inches in length. In both species the females are smaller and duller in their plumage.

These two cassiques, like their larger relatives, are also sociable hang-nests, building their nests in larges generally connected, clusters among the branches of trees throughout the colony generally, though they seem to prefer the neighbourhood of settlements and lands cleared for cultivation, and, in the case of the

yellow-backed form, even in towns, as for instance, New Amsterdam, Berbice. Sugar estates, provision fields, river settlements, timber grants, etc., are favourite habitats. The nests are short and purse-shaped, and from one to two feet in length. It is a curious fact that almost invariably these nests are found built in the immediate vicinity of the nests of stinging ants and wasps which render them safe from molestation though the insect homes are often so hidden that it is difficult to perceive them until the attempt to secure the birds' eggs has been made.

The red-backed mocking-bird is much less common than the yellow species, though in some places it may occur altogether to the exclusion of the other. The notes or song of the two species are very varied and frequently imitative of the song of other birds, so that one requires some little training to be able to recognise them with certainty. These birds sometimes are referred to as orioles, but to prevent confusion, the term should be avoided.

The black cassique, or, as it is known in the colony the large rice-bird, *Cassidix oryzivora*, will readily be recognised by its uniform black glossy colour. The species approaches the bunyahs in size, being about 14 inches in length. The frontal shield is distinct though not large, and the neck of the males carries an elongated series of feathers capable of being raised

like a ruff. The females are smaller and duller than the males.

These birds are parasitic in their breeding habits. They do not appear ever to make nests of their own, but utilise the nests both of the bunyahs and the mocking birds for their purposes In their distribution in the colony they are similar to those birds,

The six following species differ from the preceding in being more adapted for life on the ground. They consequently frequent grassy and open spaces and savannah lands rather than the forests, and in correspondence with their habits, their legs and feet are longer and stronger. Some of the forms, such as the reed-birds and the so-called robins, are represented by an enormous number of individuals ; others, like the maize-birds and the savannah-larks are sparsely distributed, except in certain districts of the interior ; while again one form, the small rice-bird, *Dolichonyx oryzivorus*, is very seldom met with. This small rice-bird is a migrant from North America during the winter, and is only known in the colony from the high lands of the interior. It is curious that while during the breeding season in the North the males are coloured with black varied with yellowish, ashy and brown, they assume the blackish and brown tint of the females at other times, and are thus met with here. They are about 7 inches in length, and are distin-

guished by having a much shorter and thicker beak than the other Icterids, and pointed tail-feathers.

The common lazy-bird of the coast, *Molothrus atro-nitens*, is slightly larger than the small rice-bird, and is of a uniform shining purplish-black in the adult males, the females being blackish-brown, as is the case with the young males. The beak is somewhat longer and thus appears to be not so thick.

The chief peculiarity of this bird, and one that has led to its common name, is its cuckoo-like parasitic nesting habit. It selects, as does the Old World cuckoo, the nests of smaller birds in which to place its eggs, leaving them to be hatched out and tended by the foster-birds. The little house-wrens are in this case the sufferers, and the anxiety betrayed by them to secure a sufficiency of food for their voracious foster-chicks, is really painful to witness. Many of them, however, by the inaccessibility of the small places selected by them for their nests, manage to secure themselves from the attention of the larger lazy-birds, but no doubt the great bulk of them suffer.

The various species of the genus Molothrus, scattered over the New World, all possess this cuckoo-like habit, and it is a curious fact that this peculiarity should be found in a family of birds so distinct from the cuckoos, while the American allies of the cuckoo resemble ordinary birds in their nesting habits.

The lazy-birds are plentifully distributed over the colony wherever the wrens are found, and are peculiarly abundant in the towns and coast settlements. The males are greatly prized as cage-birds, being hardy and sprightly in confinement, and their notes are sweet and lively.

The savannah-lark, *Sturnella magna.*, and im-Thurn's maize-bird, *Agelæus im-thurni*, are species that are met with chiefly in the open or savannah lands of the interior, the latter species frequenting especially the low bush of the more elevated districts, where they will at times be seen in confinement among the Indian houses. This maize-bird is about 10½ inches in length, and of a black colour, the elongated feathers at the angle of the wing being yellow.

The savannah or meadow-lark, on the other hand, is about 9 inches in length, and of a brown colour above, varied with blackish and yellowish, with yellow stripes and superciliaries, and passing into yellow below, a more or less distinct gorget being black. They are further distinguished by having the outer secondary quill-feathers much elongated, the tail feathers pointed, and the feet very strong. They are by no means closely related to the true larks, but their aspect fully excuses the application of the name. The birds range over the low-lying savannahs not far distant from the coast, as well as over those of the interior.

The little reed-birds, *Xanthosomus icterocephalus*, and the so-called robins, *Leistes guianensis*, are two of our commonest coast birds, and in certain placed at certain times they swarm in flights of several hundreds among the reeds, grasses and rice fields, darting in and out according as they are disturbed, and all the time uttering their shrill twittering, much in the case of the flights of the chestnut-bellied grass-birds. They are both about 6½ inches in length, and of a prevailing black or blackish colour, but while in the reed-birds the whole head and neck are yellow in the males, in the robins the whole breast and middle belly are bright scarlet. The females and young males of both species lack the bright tints of the adult males.

Of the six remaining members of the family, three are true troupials of the genus Icterus,—a genus that is so widely and extensively represented by different species over tropical and sub-tropical America. Our local forms are known as the troupial, the cadoorie and the yellow-plantain bird. These birds are of much the same size, from 8 to 8½ inches in length, the yellow-plantain bird being somewhat smaller; and their colour is made up of black, yellow or orange, and white tints.

The troupial, *I. croconotus*, is the well-known beautiful cage-bird brought from the interior savannahs

adjoining the Brazils, and so frequently seen in houses in Georgetown. In full plumage the males are of a bright orange colour, the front and sides of the head, the throat and tail, being black. The wings, too, are black with the exception of an upper orange patch and a white lower patch formed by the white margins of the secondary quills. The females and young males are often paler. From their hardiness, their active and sprightly ways and their brilliant whistling and twittering, taken with their beauty, these birds have become great favourites in confinement, and comparatively high prices are paid for fine examples Though they are chiefly fruit and insect feeders, like the other members of the family, they have very miscellaneous tastes as regards diet and are thus easily catered for. Much indeed might be written of their interesting ways. Unfortunately they are confined to the far interior.

The cadoorie, *I. chrysocephalus*, is even a more brilliant singer than the troupial, though its plumage is much less beautiful. It is of a prevailing black tint, the top of the head, the upper coverts of the wings and the thighs being yellow. This species is also a favourite cage-bird on account of the sweetness of its song. It is a hardy and widely distributed arboreal form, being found in all parts of the colony.

A rare species of this group, and one that is seldom met with, is the yellow hang-nest, *Gymnomystax melanicterus*, a bird of nearly 10 inches in length, of bright yellow plumage above and below, with the exception of the back, wings and tail which are black.

In the young males, the crown of the head is blackish and the other parts are paler.

Of the remaining two species, one, *Quiscalus lugubris*, passes under the common name of black-bird. It is about 8 inches in length, and of a bright bluish-black colour. The beak is thinner and more curved than in the generality of the Icteridæ, and the tail is strongly graduated, the shorter outer feathers placed above the central ones presenting a somewhat boat-shaped appearance when the bird is flying.

The black-birds are common on the coast lands in the neighbourhood of the settlements and pastures, where they will be seen almost as frequently on the ground as on the trees. Their eggs are much like those of the music or song-thrush of the Old World.

As in so many of the Icteridæ, the females are smaller and duller in colour than the males.

The last species of the family, the curly-headed black-bird, *Lampropsar tanagrinus*, is a very common bird along parts of the Barima river, but appears to be scarce in other parts of the colony for they are seldom obtained. Possibly this is because they are

mistaken for the common black-bird, which they resemble in size and general colour, though the bluish tint is scarcely present. They much resemble, too, the black tanagers. They will readily be distinguished from the common black-birds by their round normal-shaped tail and by the fact that the frontal feathers stand erect, giving a curly appearance to the top of the head.

Section II.—*Songless Birds*, (Tyrant shrikes, cotingas, manakins, etc.)

This section of the Perching birds, the Mesomyodian or Songless Passeres, is, as already stated, distinctively American, and includes some of the very commonest and most characteristic colonial species. Familiar examples may be found in the kiskadees, the muff-birds, the pipitoories, the cotingas, the cock-of-the-rock, the bell-bird, and the various forms of manakins, American creepers and flycatchers or ant-thrushes, of which many are widely distributed, even in the towns and settlements, while others are found only in the true forest.

It must be understood, however, that while these forms are grouped as songless birds, they are by no means voiceless. Indeed some of the most characteristic sounds to be heard both on the coast and the

interior are the cries of various members of this group, cries that are usually exceedingly loud and harsh, and quite remarkable in relation to the comparatively small size of the birds. No one who has ever travelled through our forests can ever forget the shrill and piercing notes of the pi-pi-yo or greenheart birds, heard either singly, answering each other as it were, in rapid succession, or in the great numbers in which they so frequently occur and almost deafening the ear with their persistent clamour. Quite as remarkable, too, are the ringing notes of the snowy campanero or bell-birds and the bellowing of the calf-bird or bald-headed cotinga. It should be noted, however, that when heard from a distance, or high up in the dense forest, the harshness of the notes becomes deadened, and the sounds are by no means discordant.

Of the several families of these birds, that of the tyrant shrikes or tyrant flycatchers, *Tyrannidæ*, is one of the largest and most interesting, including as it does some scores of colonial species. They are none of them large birds, nor do they show the lovely plumage so common in the cotingas. Their tints are generally olive-brown, white or black, varied with yellow or green, red appearing in a few forms. The beaks are strong, wide, depressed and strongly hooked, furnished with abundant bristles at the base. As

a group they are pugnacious creatures, and they terrorise even over the large hawks.

The commonest of the tyrant shrikes are the familiar kiskadees, of which there are five distinct kinds that pass under the same name. The best known is that bold and fierce bird, the sulphur-breasted kiskadee, *Pitangus sulphuratus*, whose loud, harsh and persistent cry of "kis-kis-ka dee," may be heard at all times of the day and in all parts of the town. It is about eight inches in length, of a brown tint on the upper surface, passing into pure yellow below except on the throat which is white. The head is black with a large erectile yellow crest tipped with black, and surrounded by a white band. The beak is long and formidable, with a strong terminal hook.

This is one of the most lively rapacious and pugnacious of our birds, domineering over nearly all species except the quick-flying swallows and humming birds, which occasionally attack them. Their diet is a liberal one, since they feed on whatever they can get. They are markedly insectivorous, but while in this respect they do a good deal of good in destroying insect pests, they are themselves very destructive to fruit, and thus become an even greater nuisance than the insects they destroy. Their voracity is astonishing, and not content with what they themselves

procure they will frequently be seen darting at other birds and compelling them to give up what objects they may have been able to secure. Their presence in our fauna therefore can hardly be regarded as an unmixed blessing. Their common cry is often given up for a time, and their notes are then just a repetition of a nasal "tweek."

The broad-beaked kiskadee, *Megarhynchus pitangua*, is a slightly larger form, commonly met with in densely foliaged trees such as the tamarinds, soursops, etc. In this form the erectile crest is orange-yellow, and the beak is enormously widened and flattened, becoming almost shovel-shaped. Its cry is much harsher and deeper than that of the commoner species, but is not so shrill and continuous, and the bird is much more solitary in its habits, perching for long periods in the same position. It is altogether less active and pugnacious.

The small long-beaked kiskadee, *Pitangus lictor*, is much smaller than the two former species, being only about 6 inches in length. In general appearance, it is much the same, but the beak is markedly thinner and narrower, thus appearing considerably longer. Its habits are similar to those of the common form, but it is naturally a much weaker tyrant. Its distributon is also similar, the two occurring all over the colony, being especially abundant in the more open

spaces, and in the neighbourhood of settlements.

A fourth kind of kiskadee, *Myiozetetes cayennensis*, is also very common in the colony, being the predominant form along the lonely creeks. It is somewhat smaller than the last species, with similar plumage. The beak, however, is small and short, and much weaker relatively than that of either of the other forms. In correspondence with this structure, the habits of the birds show much less pugnacity. Though passing under the common name of kiskadee, the species seems hardly ever to utter the characteristic cry which has given the name to the others, and it would appear that it owes the common name to its resemblance in colour rather than to the similarity in note. As a fact, the cry invariably heard by the writer is simply that of "tweek," uttered slowly and by no means loudly, and often repeated over and over again. This same cry will often be heard from the common kiskadee, but uttered quite harshly and loudly as though it were a note of challenge or defiance.

The fifth species of kiskadee, *Tyrannus melancholicus*, differs much in appearance from the others. The whole upper surface is brownish or greenish grey, and there is no white band on the head, though there is a concealed patch of scarlet and yellow on the crest. The breast, too, is greyish, so that it is a

much less brightly marked form. The tail is not square or rounded as in the other kiskadees, but comparatively deeply forked; and the wings are markedly longer. Owing to the latter character the birds are much better fliers, and their flight is easy and graceful, compared with the more jerky plunges of the other species.

This very common bird, which frequently is referred to as the grey kiskadee, is of the same size as the equally common *Pitangus sulphuratus*, but it is much less lively and quarrelsome. It is a solitary creature, and seldom will two be found together. Stationary on a bare twig or other lonely perch for long intervals, it will be observed at times to dart swiftly at some passing insect, which it carries back to its former perch, and this may be repeated again and again, affording a marked contrast to its more lively and pugnacious namesake which usually is continually on the move

Almost as common as the kiskadees are certain greyish tyrants of about six inches in length and with rather small flattened beaks. These are the familiar muff-birds, three species of which are widely distributed over the coast districts, while several others are only known from the far interior highlands. The commonest of all about the town is *Elainea pagana*, in which the general colour is a greyish olive above,

and greyish white passing into yellowish below. The head is darker aud slightly crested, a concealed vertical spot becoming visible when the crest is raised. The wings are barred with white, due to the white edges of the feathers. These muff-birds are found in all parts of the towns more especially about the bushy gardens, and their peculiar cry, which is closely like the sound of *I'll hit yon, I'll beat you*, will easily help to identify them. While like the kiskadees they are more or less of a pest to fruit, they are much more insectivorous, and owing to their quick movements they often secure tit-bits which the stronger kiskadees compel them to give up by pursuit. At such times the muff-birds are seen at their best, as with ruffled plumage and raised crest they appear to be hesitating as to whether to attack the domineering tyrants or not. The fiercer bird, however, sufficiently overawes them, and they invariably fly off in search of pastures new.

Another common species is *E. albiceps*, which resembles the former in all its characters except that there is no yellow on the under side. A third form, *E. gaimardi*, will be at once distinguished by its smaller size (slightly over four inches in length), and by the concealed spot in the crest being yellow or yellowish white. It is by no means as common as the

two preceding birds, but it will be found plentifully distributed over the coast districts.

Among the smallest members of the family are the pigmy tyrant shrikes, familiarly known as pipitoories. They are less than $3\frac{1}{2}$ inches in length, with beaks that are quite long, broad and flattened, especially when considered in relation to the size of the birds, and this character alone will serve at once to distinguish them from the little flower-peckers or sugar-birds of the genus Certhiola already described, which are frequently mistaken for them owing to a general similarity in size, colour and habit. Two species of the genus Todirostrum are very common, and will frequently be observed hunting for insects among the flowering plants or among the branches of the large trees where they search assiduously among the cracks of the bark for hidden prey. In both the upper surface is greyish or olive with darker or black crown, the under surface being yellow; but while in one, *T. cinereum*, the yellow below is unspotted, in the the other, *T. maculatum*, it is thickly striated or spotted with black, the throat also being white. For such small birds, their nests are peculiarly elongated, the aperture being lateral and almost median.

Closely related to these pipitoories are the tiny broad-beaks, Platyrhynchus, in which the beak is quite short, and is disproportionately broad and flat-

tened. The commonest of these is *P. superciliaris*, which is olive above and yellowish below, the head being marked by a black patch below the eye and a black superciliary line. The crown, too, is of a chestnut colour, with a yellow patch in the middle.

Another very common small tyrant shrike, about 4 to 5 inches in length, known as the cotton-bird, *Fluvicola pica*, is usually to be found about the grassy parts of the colony, more especially by the trenches on the out-skirts of the towns and settlements, among grassy and bushy wastes. With the exception of the back of the head, the middle back, the wings and tail, which are black, the rest of the bird is pure white, and the species may well be taken as an example of many others of the tyrant shrikes, in which black, white or grey tints predominate, in contrast with the olive and yellow tints in the preceding species.

The pretty but sober-coloured cotton-birds feed chiefly on insects and worms which they seek among the grass and low bush and on the ground. They are not at all shy, but will allow of one's close approach.

In similar places to the above on the outskirts of the town will be found another and smaller tyrant, known as the parson-bird, *Arundinicola leucocephala*, With the exception of the head and neck, which are

white, the rest of the bird is of a deep shiny black in the male, while in the female the colour is of a prevailing greyish ash. These birds, like the cotton-birds, frequent the neighbourhood of water, perching on the small twigs and stems, but chiefly on the reeds and sedges. Almost invariably they will be seen in pairs, darting from bush to bush in search of insects.

One of the most interesting members of the family is a common bird throughout the colony, and found even in the immediate vicinity of the towns. This is the grey, long-tailed or scissor-tailed tyrant, *Milvulus tyrannus*. Above it is of a deep ash colour, with black crested head, a concealed part of the crest being yellow, distinctly visible when the crest is raised. On the under surface, the plumage is white. The most characteristic feature of the bird is the enormously elongated tail, the outermost feathers of which reach a length of about 12 inches in the males and the middle ones about 3, out of a total length of about 15 inches. In the females the tail feathers are shorter.

These birds particularly frequent the cleared lands and grassy wastes, or savannahs, where they will be seen perching on the tips of the dried twigs and on the various bushes, flitting away at intervals in search of insects, worms, lizards and other such objects. They

are bold, fierce and domineering creatures, and though by no means particularly active, they can on occasion dart with considerable swiftness, especially in attacking other birds—even the large rapacious hawks, when they have secured some visible prey. Thus the writer has seen them attack, with crest erect, even the fierce little savannah kestrel or falcon, when it swooped down and secured a lizard from the ground, the kestrel being forced by the attack of the tyrant to abandon its prey and to make off, while the enemy devoured at ease the coveted morsel.

Quite as remarkable as the foregoing is the black, long-tailed tyrant, *Copurus leuconotus*, in which the two middle feathers of the tail are much elongated, reaching a length of nearly 8 inches in the males, those in the females being shorter. Here, however, these elongated feathers are not broad as in the grey form, but very fine and thin. In general colour, these birds are black above and below, the head and back being greyish, passing into pure white on the rump.

Unlike the grey long-tailed shrike, this form is only known from the forest districts, and it would appear to be very rare or difficult to procure, specimens hitherto having been obtained in the colony, to the writer's knowledge, only along the Upper Mazaruni river.

Much more remarkable, however, than any of the

preceding species are the greatly developed and beautifully crested forms of the royal tyrant shrike or royal fly-catcher, *Muscivora regia*. These striking birds are about $5\frac{1}{2}$ inches in length, and of a variable tint of brown, ochraceous and ashy, lighter and yellower below, and more or less transversely barred. The bill is markedly elongated and flattened, and the bristles at the gape very abundant and stiff. The crest which is the most striking feature, is elongated, and vertically expanded to form quite an open fan, and this is of a brilliant scarlet, tipped with purple in the males, and of a golden yellow in the females.

These beautiful birds apparently frequent only the dense forests, and up to the present they have only been secured on the Upper Mazaruni districts. They thus appear to be as rare as the black long-tailed tyrants, which come from the same locality.

One other tyrant shrike deserves notice owing to the contrast afforded in the colour of the plumage as compared with other members of the family. This is the red-crested fly-catcher, *Pyrocephalus rubineus*, in which the body is dark ashy above, the crested head and under surface being bright scarlet. The beak is slightly elongated and flattened, as in tyrant shrikes generally.

The species is not common, being only found in the interior, on the savannahs and bushy wastes,

and adjoining low forest. The females are very different in appearance, the bright red giving place to greyish and ashy, more or less suffused with pale red.

The family of the chatterers or cotingas, *Cotingidæ*, unlike that of the tyrant shrikes, includes birds that are only known from the heavily forested parts of the interior, and though on account of their brilliant tints and peculiar characters they are greatly sought after for collections, to the mass of the people in the colony they are almost entirely unknown owing to their absence from the inhabited areas of the coast. To the traveller in the interior, however, they present some of the most interesting features of our Fauna whether they be regarded from the aspect of beauty, peculiarity of structure or distinctiveness of cry. Nowhere in the great group of birds, not even among the altogether lovely humming-birds, do we meet with any combined brilliance or beauty of tint exceeding that of the magnificently coloured cock-of-the-rock, the fire-bird, the purple-throated, the purple-breasted or the pompadour cotinga or the military chatterer, where the variation in plumage is as remarkable as its richness; and the representatives of the family therefore, which number about a score, are deserving of some detailed description. As a group, they are closely related both to the manakins and tyrant-

shrikes, and the strongly hooked beaks of certain forms render possible their inclusion in the latter family in spite of other characters which relate them to the typical cotingas. As a rule the beak is rather elongated, compressed, and very wide at the base, the gape being proportionately wide and very deep.

The most typical members of the family are the purple-throated and the purple-breasted cotingas. In the former, *Cotinga cayana,* which is about 8 inches in length, the plumage is of an intensely bright blue above and below in the males, the whole throat being of a deep reddish purple, while in the latter, *C. cærulea,* which is somewhat smaller, the blue is of a much deeper or azure tint, the whole throat and breast being purple.

Closely connected with these is the pompadour cotinga, *Xipholena pompadora*, which is intermediate in size between them, and is of a deep shining reddish purple above and below, the wings, however, being white. The males of this species are further characterised by the elongation and narrowness of the wing coverts, the stems being also much hardened and thickened. The females and young males in all three species are of an ashy or grey tint, and every stage between the two conditions in the males will be met with in their first or second year.

A very peculiar change in the reddish purple

colours of these three species, may be artificially produced by the application of heat, as already mentioned in the introduction. If a hot iron be passed over the purple parts, or if they be exposed to the heat of a fire so as not to singe the feathers, the purple areas change entirely to a bright shining red, and as this is producible at all times permanently in the dead skins, it is likely that the same change can be caused in the living birds. So marked is the appearance of the birds after the change, that unless one knew of the peculiarity and was somewhat familiar with the colouration of the various known species, it would be impossible to deny them separate specific rank. The tale current in the colony is to the effect that this change in tint was discovered accidentally by a bird-skinner, who failing other light by which to work at night, got so close to a strong wood-fire that the heat affected the colour of the plumage, the purple tints being found afterwards changed to bright red. The change is often caused by the local skinners for the purposes of fraud, the changed birds being passed off as separate forms in order to secure a larger sale. This direct influence of heat on colouration is extremely suggestive as to the effect generally of temperature on the gradual modifications in plumage of birds in various localities.

Closely related to these three species is the small

violet-tufted cotinga, *Iodopleura fusca*, of about $3\frac{1}{2}$ inches in length, in which the upper side is black with a white rump, the under side being brownish-white, and the sides of the breast adorned with a tuft of elongated violet-coloured feathers.

Altogether magnificent and striking, even among its brilliant congeners, is the unique and lovely cock-of-the-rock, *Rupicola crocea*. This is a bird of less than 12 inches in length, and of an intensely rich orange colour in the males, the females and young males being brownish. Many of the feathers of the wings are produced into delicate filaments which give quite a fluffy appearance to the plumage, while the large double crest, compressed from the sides along the middle line of the head, from the beak backwards, renders it altogether peculiar among its kind. An interesting modification in the structure of the wings is seen in the reduction of the first quill feather, the terminal part being represented only by the shaft of the quill—a character that has an important relation to other similar modifications in other forms of the family.

The cock-of-the-rocks do not occur on the lowlands, but are met with in large numbers on the elevated lands and mountain ranges, though not on the chilly higher parts of such mountains as Roraima. They are largely terrestrial in their habits, as may be in-

ferred from their strong feet, which are peculiarly enlarged in comparison with others of the family. Their note is a peculiar harsh cry of *Kwank, Kwank*, and if this be uttered repeatedly among the hills that they frequent, the birds can be brought, again and again, immediately overhead in the trees, when they can be easily shot with either gun or poisoned arrow. The latter method in all such cases, is infinitely preferable, since there is no noise made which would startle the other individuals.

These birds are known to breed in the early part of the year, and their nests will be met with among the rocks in the mountains. The nests are made of palm fibres worked together and cemented by a gummy material, with pieces of sticks, moss or lichens on the outside, and they are placed on the bare rock, pressed up against one side. The eggs are usually two in number, somewhat larger than a pigeon's egg, and of a dirty whitish cream colour, thickly marked on the larger end with ruddy and ochreous-brown blotches.

Their peculiar habit of treading down wide open spaces where they congregate in the breeding season, and where the males go through peculiar dancing antics, strutting about with ruffled feathers before the others, is well-known, and is made use of by collectors who take advantage of such gatherings to secure specimens in large numbers. They are frequently

kept as cage-birds, but they seldom thrive, the conditions on the coast being so markedly different from those of their native haunts.

Another brilliant cotinga will be met with in the fire-birds, *Phœnicocercus carnifex*. These are birds of about $8\frac{1}{2}$ inches in length, and of a brilliant scarlet on the crested head and on the rump and under surface in the males, the other parts being deep purplish-brown. The females are much browner, suffused with blood-red. As in the cock-of-the-rock, the wings present a curious modification, though in this case the fourth quill is the one that shows reduction and shortening, and not the first. As in the case of the greater number of the brilliantly coloured cotingas, practically nothing is known locally of their breeding habits.

Two other common species of cotingas must be mentioned in this connection since they also show reduction in the wing, the second quill being so small and shortened as almost to be overlooked in examining the birds. The black and white cotinga, *Tityra cayana*, is about $7\frac{1}{2}$ inches in length, of a clear greyish white in the males, the head above, and the wings and tail being black. The bill is red, with a black tip. The female differs only in having the back and breast marked with long black shaft stripes, thus presenting a great contrast to the condition among the greater number of brilliantly coloured

species, in which the females are, like the young males, quite dowdy in appearance in comparison with their mate.

These birds are common all over the forest areas both in the lowlands and on the highlands. They nest, as so many other birds do, such as the woodpeckers, parrots, bill-birds, etc., in the holes in the dead trunks of high trees, and it appears they utilise deserted and old nests for the purpose.

The rosy-necked cotinga, *Hadrostomus minor*, is smaller than the foregoing, being about six inches in length, and of a blackish colour above and ashy below in the males, with a bright band or patch of rosy-red on the lower part of the neck and with rufus patches on the wings. The females are peculiarly marked, the general colour being ashy, the rump and tail chestnut-red, and the under side dull cinnamon. The distribution in the colony corresponds with that of the black and white cotinga.

Except that the birds are larger and the wings normal, the greenheart birds of the genus Lathria closely resemble the preceding form. A rare species from the Roraima districts, *Lathria streptophora*, reaches a length of 8½ inches, the prevailing grey colour being broken by a magnificent rosy-red collar round the breast and neck in the males, while the under feathers near the tail are of the same tint.

The common greenheart bird or pi-pi yo, *L. cinerea*, to the loudness and peculiarity of whose cry reference has already been made, reaches a length of about nine inches, and is clothed entirely in sober grey, which so blends with the subdued light of the forest that even when the birds are perched close overhead, and whistling their loudest, they are extremely difficult to distinguish. As a change note from the ringing *pi pi-yo*, the last note or *e-yo* is frequently uttered, especially when the birds are much disturbed or alarmed. They are found all over the lowland forests.

Of all the cotingas, perhaps the bell-birds or campanero, *Chasmorhynchus niveus*, are the most interesting and peculiar as regards colour, structure and cry. They are about 10½ inches in length, and in the adult males are of a pure snowy-white, which, however, when the birds are much handled as dressed skins or are badly preserved, turns to a pale yellowish-white. The females and young males are of a yellowish-green, and would hardly be associated with the adult males by the inexperienced. The gradual change in the males from green to white gives rise to a very interesting series of mottled birds, green or white predominating according to the age of the bird.

The males are further characterised by the possession of a peculiar elastic wattle, fastened to the top of

the beak, which is extremely extensible, and hangs, when elongated, pendent from the beak much like the wattles of the turkey. This caruncle was originally supposed to be carried erect and inflated on the head when the bird rung out its curious notes, but we now know that this is never the case and is in fact an impossible position. Nor has the caruncle any direct action in causing the notes.

The notes of the bird are peculiarly striking, and have been very variously represented by different travellers. By some the tones have been compared to a rich bell-like note: by others to the peculiar metallic sound like the ringing of the hammer on an anvil. In reality, their cry is a combination of both, as can be easily noted by any one who has the chance of listening to the fully-developed adult males in confinement, or who has the opportunity in nature of observing them at close quarters and continuously for long periods. Mr. Barrington Brown (Canoe and Camp life in British Guiana) was the first English writer who gave an accurate description of the notes. As he states, the common cry is a sharp and loud metallic clanging sound, as of *Kong-kay*, the last part being very prolonged. The head at this time is directed downwards, and by the clanging of the cry through the forest, the position of the bird can readily be found, if the trees be not too densely crowded or

clothed with foliage. This cry will often be repeated time after time, and may by a careless observer be taken to be the only cry, as apparently it is to the young males in which the caruncle is not fully developed, and the voice organs not mature Over and over again, where the birds are common, these clanging cries will be heard in all directions, and with a very variable depth or shrillness of tone, depending on the age of the birds.

At intervals, however, a very different and true bell-like note is rung out, like the sound *Do-rong*, with the last part also greatly prolonged. At such times, the head is directed upwards, and though the notes be loud and clear, it will be practically impossible to detect the position of the bird, owing to the even resonance over or through the forest. Even when these notes are heard close by, they are sweet and musical and deep, while the *Kong-kay* tones are harsh and shrill.

The following contribution to the literature of the subject by the writer some years ago in *Timehri*, vol. VI., 1892, will place the first direct observations made on the living birds clearly before the reader:

"A good deal of misconception prevails as to the position of the caruncle in the bell-bird. Ordinarily it is stated that during the utterance of the notes of the birds this appendage is inflated with air and becomes erect; and in the common representations

in popular books on natural history, from which so many necessarily acquire their information, this appendage is shown in this position, greatly elongated and distended, and projecting straight upward from the top of the beak. It must be confessed that this position is the one generally found in the stuffed bird, and it has given rise to the belief that it is the natural position. Recently, however, I have been able to examine and observe two living birds, which have been kept in town for some time, and I have been able at the same time to study the methods in which their notes are uttered.

"The caruncle is never carried upright. The erect position, in fact, is an impossible one, since the organ is made up of very fine elastic tissue, which causes it to depend lower and lower over one side of the beak during extension. When the bird is about to utter its characteristic notes, this appendage slowly becomes greatly elongated, to as much as five inches, I have observed at times. At the conclusion of the note, the organ may remain extended till the next note, or may be partially retracted; but when a long interval takes place, the structure is always allowed to shrink up to about half an inch or an inch in length, at will, and it then hangs against the beak. During extension, the caruncle is never distended with air, but is always in a state of collapse.

"When the appendage is fully elongated, the bird suddenly inflates its lungs, right and left, by indrawing almost by a swallowing action, two great draughts of air; and the method by which this is done depends upon which of its two characteristic notes it intends to utter. When the notes *Kong-kay* are uttered, the action of inflation has been performed by two distinct inhalations of air, one with its head turned to the right and the other immediately after to the left. At the moment of the utterance of the notes, the head is turned to the right for the *kong*, and then suddenly—so suddenly that it almost startles the observer—the head is swung round to the left for the *kay*, which is issued with a strikingly loud, piercing metallic ring or clang—so loud and shrill indeed that, if the observer be close by, the ears are actually deafened for the moment by the sharpness of the sound.

"When, however, the sweet, musical and deeply-toned bell-like notes *Do-rong* are about to be uttered, the bird is observed simply to hold its head forward, and to make two distinct gulps of air; and then holding its beak upwards, and slightly extending its neck, the notes are rolled out, as it were, with full voice and roundness and resonance.

"On each occasion, as already stated, the caruncle is depended in a state of collapse to its greatest length possible over one side of the beak. One of the birds

on which the above notes were based, I may state, was a fully developed male; the second, a younger male, altogether lacked the power and strength of utterance of the former, whose notes were to be heard at a very considerable distance away from the house in which it was kept, in spite of the ordinary confusing noises of a town."

The bell-birds do not occur in the coast districts, but they are met with just where the lands become slightly elevated, and in parts of the far interior they are common even among comparatively low bush by the water-courses.

A second species is known from the highlands around Roraima. This is the variegated bell-bird, *C. variegatus*, in which the length of body is somewhat less, while the head is brown and the wings black. There is no caruncle on the beak in this species, but the throat is denuded of feathers, and is covered with a number of small caruncles. The female is green with a grey head.

The blood-red or military chatterer, *Hæmatoderus militaris*, stands out sharply contrasted from all the other cotingas. The males are of an intensely bright scarlet colour, above and below; and the feathers of the head, neck, breast and rump, are narrowed and elongated. The females are distinguished by having the upper surface blackish-brown, and they are smaller

than the males, which are about 13 inches in length.

This is an extremely rare species, and is only known from the hills of the far interior.

The smaller crimson-throated cotinga, *Querula cruenta*, will be recognised by its black colour above and below, a large patch of elongated feathers on the neck, however, being dark crimson in the males. It reaches a length of about 9 inches.

This is a common species away from the low coast lands, though its distribution seems to be very irregular.

The large and rare Oronoque chatterer, *Pyroderus orenocencis*, about $14\frac{1}{2}$ inches in length, has so far only been obtained on the Cuyuni river, the two specimens in the local Museum having been presented by Mr. Michael McTurk, C.M.G.

The plumage is of a dull black above, while the throat and neck are dark orange-crimson, and the under sides chestnut-brown.

The bald-headed cotinga, *Gymnocephalus calvus*, variously known as calf-bird, quow-bird, and bald fruit-crow, will be known by its prevailing yellowish chestnut-brown plumage, the head being bare of feathers, except for a few bristles. The gape of this bird is extremely wide, and the cry is more like an imitation of the bellow of a calf or cow than of the cry of any other creature that could be mentioned. To

any one who has heard the sound to advantage not far off, it is an absolute surprise that such a comparatively small bird (about 14 inches in length) can make so great a noise. They are widely distributed in the forest districts of the interior.

The bare-necked cotinga, *Gymnoderus fœtidus*, also known as bare-necked fruit-crow, is another of our very rare species from the interior. The general plumage is black, the head being covered with short, velvety black plumes which are as soft and smooth as plush. The sides of the head and the neck are bare of feathers except for a few scattered plumes; while a large patch on the wings is of a most delicate silvery-grey in the males. Though of such sober tints, this is one of our most striking-looking birds.

Two other common and sober-coloured forms deserve mention. In one, the yellow-rumped cotinga, *Attila uropygialis*, of about $6\frac{1}{2}$ inches in length, the beak is very strongly hooked and compressed, like many of the tyrant-shrikes. It is of an ashy and yellowish brown above, with bright yellow-rump, being much paler below. In the other, the spotted cotinga, *Aulia hypopyrrha*, which is about 8 inches in length, the plumage is ashy grey, with rufous spots on the wings and tail, and rufous feathers in spots or patches below, tipped with black. Both species are widely distributed over the forest districts.

The family of the manakins, *Pipridæ*, is closely related to the cotingas, and in fact they have been usually classed with them. They differ, however, in many characters, and markedly so in the toes being more or less united. This same character also separates them from the tyrant-shrikes with which they are closely connected. They are mostly quite small birds, with short tails, and short beaks, much expanded at the base. The sexes are usually unlike, the males being of brilliant colouration, and the females quite dull and generally green. The species are very variously distributed, some being very common on the coast, while others range to the far interior, where others again are only to be obtained, and chiefly at Roraima.

The commonest on the coast is the golden-headed manakin, *Pipra auricapilla*, which will be found even in the neighbourhood of the towns. It is a shining black bird of about 4 inches in length, with a golden-yellow cap on the head, and with crimson thighs. The females are, green, paler and somewhat yellowish below. They especially frequent, as do most of their kind, the thick bushes by the waterside, both along the great rivers and the small creeks.

Easily to be distinguished, is the common white-headed manakin, *P. leucocilla*, a small shining black bird of about $3\frac{1}{2}$ inches in length, with a white cap on

the head. The female is green, paler below and somewhat ashy.

Two glossy black species with bright scarlet heads are extremely rare, and are only known from the elevated high lands, particularly around Roraima. In one, *P. iracunda*, the whole head above, and an elongated crest from the back of the neck, and the thighs, are scarlet; while in the other, *P. cornuta*, the entire neck as well is of the same bright colour. This latter is somewhat larger, being more than $4\frac{1}{2}$ inches in length, while the former is only slightly more than 4 inches. The female of *P. iracunda* is unknown, but that of the other species is green, as in the commoner forms.

A common coast form, *P. aureola*, of about $4\frac{1}{2}$ inches in length, is much like the preceding, but will readily be distinguished by having the breast and middle belly, as well as the head and neck, scarlet, while the scarlet of the throat is tinged with yellow, and the thighs are altogether yellow. This is a very common form along the creeks of the coast, as well as throughout the colony.

Quite as widely distributed is another shining black species, *P. gutturalis*, of somewhat more than 3 inches in length, in which the throat is of a clear white. The females are of the usual green tint, with whitish throat.

A very interesting little form, of about $3\frac{1}{2}$ inches in length, and one that presents considerably more variation in colour than is found in the other species, is the blue-rumped manakin, *P. suavissima*, the discovery of which, like so many of our rare forms, is due to the work of Henry Whitley during his many years' researches into the bird-life of the colony—a work that eventually cost him his life. The prevailing colour of this species is black. The top plumes of the head are white, and a bluish border behind. The rump is lilac-blue, and the belly bright orange-yellow. The females are green, with a yellow belly.

This manakin is very widely distributed in the elevated lands of the colony, being especially abundant in the wooded parts of the sandstone range. They are met with also in the lowland forests, though not actually on the coast.

One more species of Pipra deserves mention. This is the green manakin, *P. virescens*, which is one of the smallest and commonest of our bush forms, though on account of its size it is not easily obtainable. Its whole length is somewhat more than $2\frac{1}{2}$ inches, and its colour varies from green above, with a yellow concealed spot on the head, to paler green and yellowish below.

These little birds will frequently be met with flitting about from bush to bush by the riverside, dodging quickly in and out as they are pursued.

Two other interesting genera of our manakins are peculiarly modified in the structure of the wings, not as in some of the cotingas by reduction of the feathers, but by the thickening of the stems of the primary quills. In the one, *Chiroxiphia*, as the name indicates, the stems of the quills are thickened, straight and pointed at the ends, as though sword-like; while in the other, *Chiromachæris*, they are equally thickened, but are curved, as in a sabre, though the curve is inwards.

The blue-backed manakin, *Chiroxiphia pareola*, of about $4\frac{1}{2}$ inches in length, is black above and below, the mantle being blue and the head crimson-crested. This is not a common bird, and but little is known of its distribution, though it certainly occurs throughout the sandstone range.

The white-breasted or white-bellied manakin, *Chiromachæris manacus*, on the other hand, is one of the commonest of our species, being found all over the lowland forests and throughout the interior highlands. It is about 4 inches in length, black or ashy above and white below, a broad white band passing across the neck and back. The females are green throughout, though paler below.

This bird is one of the most constant attendants or trackers of the great bands of yackman or foraging ants (*Eciton* sp.) so frequently encountered in the

forest. Mixed up with various forms of small ant-thrushes and other birds, and constantly on the move flitting from one bushy shelter to another, they are with difficulty kept in view at such times for more than a moment, and though frequently watched by the writer, it has always been impossible to make out whether they feed on the ants themselves or only on the other insects constantly driven out from their shelter by the foragers. That they largely feed on these latter is certainly the case.

Two other manakins remain to be mentioned, of the genus Heteropelma, which at first might be mistaken for tyrant shrikes. They show unmistakably, however, the union of the toes so characteristic of the Pipridæ. In comparison with the other manakins, the beaks are more elongated and compressed, and the terminal notch is more distinct, while the birds themselves are much larger, with comparatively long tails.

In one, the brown manakin, *H. wallacii*, reaching a length of more than $6\frac{1}{2}$ inches, the colour is a brownish olive throughout, though somewhat lighter below. In the other, the yellow-crested manakin, *H. igniceps*, somewhat more than 5 inches in length, the upper surface is olive-green, with a bright yellow, partly concealed, vertical spot on the head; and the throat and breast are yellowish ashy, passing into pale yellow

on the belly. The partly-hidden yellow patch on the head strongly recalls this common feature of so many of the tyrant shrikes. The females in both species resemble the males.

The distribution of these forms is identical with that of the white-bellied manakin.

Brief reference must here be made to the small family, *Oxyrhamphidæ*, a unique form of which was obtained for the first time from the sandstone ranges by Henry Whitely—a form that is related to the tyrant-shrikes, the cotingas and the manakins, though more closely so to the first-named. The family contains the single genus Oxyrhamphus, which is distinguished by its straight, sharp-pointed bill, beset all round by many short and small bristly plumes. The toes are nearly free.

The local species, *O. hypoglaucus*, is less than $6\frac{1}{2}$ inches long, of a green colour above, the head being furnished with a large scarlet crest, bordered with black; beneath it is white, with a slight greenish cast on the sides of the body, marked with crowded dark shaft-spots.

Though only known from the neighbourhood of Roraima, these birds are fairly common in the district; and the hunters who may be sent out with blow-pipes to obtain miscellaneous specimens, seldom return without one or more of them in their collections.

Two families of the Passerine birds yet remain to be described, namely, the so-called American creepers or *Dendrocolaptidæ*, and the American bush-shrikes, flycatchers or ant-thrushes, *Formicariidæ*, both of which are confined to the American continent and are distinguished from the other members of the order by the peculiar structure of the voice-organs.

The American creepers are small birds, of a prevailing brown or rusty-red colour, with long or short, more or less curved beaks, and with generally stiff spiny tails, which are used like those of the woodpeckers and true creepers, as a support in climbing the stems and trunks of trees, where they hunt for insects in the holes, crevices and cracks of the bark. The greater number of species are strictly forest-loving forms, and many of them occur in the colony. Several are very rare and are only known from the elevated highlands of the interior, while on the other hand a few forms are met with all along the coast lands in bushy places.

Perhaps the commonest of all are the little rooties of the genus Synallaxis, which are met with in open as well as bushy places all over the colony. Several species pass under the same common name, as is the case in so many of our common birds, but two forms are of most frequent occurrence on the coast. In the one, the brown rootie, *S. guianensis*, the length is

about six inches, and the general colour is of a brownish tint, paler below, the middle of the belly being white. The outside of the wings are rusty-red, and of the tail also, the middle feathers of the latter being elongated and attenuated at the tips, and half the total length of the bird. The shafts of the tail feathers also are soft, not spiny.

In the other species, the ruddy rootie, *S. cinnamomea*, which is somewhat smaller, the general colour is rusty-red above, and white below, a small patch on the chin being yellow.

The rooties are met with all about the neighbourhood of the towns and settlements, in the hedges along the roadsides, and in the bushes about open waste lands. They construct astonishingly large nests for their size, made up of small twigs packed together more or less loosely, with the bed of the nest central of the mass and reached by a passage almost impossible to detect amid the loosely placed twigs.

The rooties are practically the only members of the family that are known to the general colonist, and that therefore are denoted by more or less distinctive common names. The others that are strictly forest-loving, unobstrusive forms, have either no common names at all, or are denoted by such general terms as creepers or spine-tails.

Two of these that are about $4\frac{1}{2}$—5 inches in length,

will readily be recognised by their short, upturned, wedge-shaped beaks. In the smaller species, *Xenops genibarbis*, the general colour is brownish above and below, the eye-stripes being fulvous and the breast striped with the same tint. The wings and tail are blackish, large parts of each being rusty-red or yellowish-red. The tail too is soft, not spiny.

In the larger form, *Glyphorhynchus cuneatus*, the rump and tail are chestnut-coloured, and the throat and breast are much more striped with fulvous; while the tail is stiff and spiny, and is quite different from the soft-shafted Xenops.

Both these species are very common in the forest districts, and will always be met with flitting from trunk to trunk, up which they proceed by little jumps, passing round and round the stem as they ascend, and evidently keeping a sharp look out for the insects on which they chiefly feed.

A rare and very peculiar form is the curved-billed creeper, *Xiphorhynchus trochilirostris*, which is but very occasionally met with, and appears to have been hitherto obtained only from the Mazaruni river, to which so many of our rare species seem to be confined. Possibly, however, this is due to the fact that the most elevated parts of the colony are more easily reached by the Mazaruni, on which they abut, than by any other river.

The curved-billed creeper will readily be known by its long, curved, thin and compressed reddish beak, of nearly 3 inches in length out of a total length of bird of 10 inches. It is of a reddish-brown tint, with fulvous shaft-stripes above and below, the wings, rump and tail being rusty-red, and the throat clear fulvous. The tail is strongly spiny.

The species appears to frequent only the dense forest, where it occurs on the top of the high trees, and little therefore is known locally of its habits.

A very common member of the family, and one met with throughout the forest area is the straight-billed creeper, *Dendroplex picus*, which is about eight inches in length and is very easily distinguished by its beak among the other spiny-tailed members of the group. The beak is about the length of the head, and is straight and strong, tapering gradually to a point. The general colour of the body is rusty-red, blackish on the head, which is marked with yellowish shaft-stripes. Beneath it is browner and paler; the throat is yellowish white; and the breast is marked with round yellowish shaft-spots, becoming narrow striations on the belly.

Two other medium-sized brown creepers with numerous yellowish stripes, of about from $8\frac{1}{2}$ to 9 inches in length of body, are also extremely common all over the forest districts. The beak in these two

forms is longer than the head, much compressed throughout and uniformly straight, the upper mandible being slightly curved down to the point.

In the smaller species, *Dendrornis pardolatus*, the head, neck and back are marked by yellowish shaft-stripes margined with blackish; the under surface is brown, and the neck, breast and belly are striped, with distinct fulvous shaft-stripes, the throat being fulvous and not spotted.

In the larger species, *Dendrornis guttatoides*, the general colour and markings are much the same, but the shaft-stripes are not continued on the back; the under side is also paler, and the shaft-stripes on the neck, breast and belly are larger and broader and distinctly margined with blackish.

In collections made in the forest districts, almost invariably one or both of these species will be found, the birds being met with everywhere, especially in the neighbourhood of open creeks, where they will be perceived flying from trunk to trunk, examining the tree much like a wood-pecker. Their strong, spiny tails, closely adpressed to the rough surface, and their strong and short feet and sharp claws, are splendidly adapted to their peculiar method of climbing on the trunks of the trees, as in fact is the case in all the typical members of the family.

Two other spiny-tailed, brown species, the largest in

the family, call for notice. These are members of the genus Dendrocolaptes proper, and are easily distinguished from all our other forms by the large, widened, depressed beak, and by the black transverse bars on the under surface.

In the smaller form, the white-throated barred creeper, *D. certhia*, which is about ten inches in length, the head and neck are marked by small, narrow, pale shaft-spots, edged wfth black; the throat is whitish, and the rest of the under surface obscurely barred by close blackish bands.

In the larger species, the broad-banded creeper, *D. validus*, which is more than 10½ inches in length, the shaft-spots above are continued on the upper back; the throat feathers are fulvous coloured edged with blackish, and the transverse bands on the breast and belly are broad and strongly marked.

Like the species of Dendrornis, these two larger forms are very commonly distributed throughout the forest districts of the colony, and are very frequently seen as they dart from tree to tree in search of insects. They are particularly common on the tree-clad areas of the elevated sandstone ranges.

The family of the American bush-shrikes, fly-catchers or ant-thrushes, *Formicariidæ*, is one that is very largely represented in the colony, a few species being quite common on the coast, while the great

majority are to be found in the forest districts proper, and many are entirely confined to the elevated high lands of the interior. The greater number are quite small forms, about five inches in length, but others range from three to about eight inches. The plumage is always of a very sober hue, black and white, grey, ashy, brown, rusty-red and yellowish tints predominating. In obvious external characters, the various forms differ very markedly, and but for the special structure of the voice-organs, they might be considered to have many different lines of affinity with other Passerine birds. In some, the beaks are very strong and strongly hooked, and are much like those of the true shrikes, while in others they are comparatively weak and but slightly notched, there being, however, all conditions intermediate between them. In others again the tail is extremely short, and the legs quite long, the birds presenting much the aspect of the Pittas or breves, of the East, while in others the legs are short and the tail comparatively elongated. A very marked character which will generally serve to distinguish the members of the family, is the great abundance of the rump feathers which are so close and thickly placed as to give a peculiar fluffy appearance to the lower part of the back. In habits the various forms are particularly insectivorous, and swarms of them will always be met with following the march of the yack-

man or hunting ants (*Eciton* sp.) which traverse the forest country in broad and numerous bands, driving out from the debris on the ground and from the houses on the line of march, and even from the trees, whatever other insects such as cockroaches, grasshoppers, etc. may lurk there. That the birds feed upon ants and thus deserve their common name of ant-thrushes, is certainly the case; but it is also certain that when they are following the great swarms of the yackman ants, they feed particularly on the larger insects which are driven out by the marauding host. That the larger species feed upon small reptiles and other forms when obtainable, is equally clear.

The commonest member of the group is the familiar check-bird, *Thamnophilus doliatus*, which is found all over the colony, and is particularly abundant on the coast generally, and in fact is the only member of the family to be found in the gardens of the towns and villages. It is about $5\frac{1}{2}$ inches in length, and the plumage is narrowly barred black and white in the males, the head being black with a concealed white blotch, visible when the feathers are raised. The females are of a rusty-red colour, yellowish below, with indistinct black striations.

These birds are almost invariably seen in pairs, and are very common among the shrubs in the gardens about Georgetown where they seem to be always in

search or pursuit of insects, worms and other food. They are brave and pugnacious creatures, readily attacking other larger birds, and when hawks fly over their vicinity, they will dash out with raised crest and ruffled plumage and even shrill cries, to challenge or scare away the birds of prey.

A larger forest-loving species, the black and white barred bush-shrike, *Cymbilanius lineatus*, may easily at first sight be confounded with the check-bird. It is, however, about an inch longer, and the bill is much thicker, swollen and more strongly hooked, and the under mandible slopes sharply upwards. The bars on the plumage are also much narrower. In the females, the barring is distinct, the white becoming reddish-yellow.

The check-bird is the commonest representative of the large genus, Thamnophilus of which many species are to be found in different parts of the colony. Two large species of about from $7\frac{1}{2}$ to 8 inches in length, and with very strongly hooked beaks, may be described. In one, the greater bush-shrike, *T. major*, the colour of the males above is black, and of the females ruddy brown, the under surface in both being white; while in the dusky bush-shrike, *T. fuliginosus*, the males are ashy above and paler below, the females being rusty-red on the upper surface passing into ashy below, where they are narrowly barred with black.

The former species is common only in the interior of the colony, but the latter is met with all over the forest districts. The strongly hooked beaks and large size of these forms enable them to secure much larger prey than the common insect diet of the family.

Three common lowland species of Thamnophilus of about five inches or more in length, may be briefly mentioned. They are grey or ash-coloured in the males, variously marked by black and white; while in the females they are more less ruddy or yellowish brown and grey. In the grey a murine bush-shrike, *T. murinus*, the ashy colour is nearly uniform in the males, there being but white edgings to the wings and tail. In the females, the colour is pale brown passing almost into white on the middle belly, and the head is somewhat reddish.

The spotted bush-shrike, *T. nœvius*, differs from the preceding by having the top of the head black in the males, the upper tail-coverts black with small white spots, and the tail black with white ends to the feathers, the outermost being marked with a white bar across the outer web. The females are brown with a reddish head, the under parts being yellowish, and the tail marked with white, as in the males.

The third species, *T. ruficollis*, differs from the spotted bush-shrike in being much darker in the males, the head, neck and front part of the back

being black; and the females are markedly different, the upper surface being yellowish-brown, and the head and under body reddish—a character that gives its name red-necked bush-shrike to the species.

A large number of other common ant birds of mixed ashy, brown and black and white plumage, referred to many different genera, but still very closely related to each other, will be met with, and a few will be mentioned as typical examples, though the generality could only be recognised from very detailed descriptions. In some which are of quite small size, the beak is weak and very different in appearance from the Thamnophili. The pygmy ant-bird, *Myrmotherula pygmœa*, may be taken as a representative. This species is about 3 inches in length, with very short tail, and with a beak not exceeding the length of the head. The upper surface is black, with white stripes above the eyes, and on the back and on the edges of the wing-coverts. The under surface is pale yellow.

Two leaden-coloured species of about $5\frac{1}{2}$ inches in length, with elongated, compressed bills, and short, somewhat rounded tails, are also common. In one, the spotted ant-thrush, *Heterocnemis nœvia*, the under side is paler than the upper, and is blotched with shaft-spots in the males. The females are brown above and whitish below with brownish marks.

In the second species, *H. leucostigma* which is slightly larger, the shaft-spots are absent from the under side, but the black wings and tail are tipped with white, as in the coverts of the former species.

A very common form is the white-collared cinnamon-ant-thrush, *Myrmeciza cinnamomea*, which is met with in all the forest districts. This ant-thrush is about 5½ inches in length, and of a prevailing cinnamon tint above and on the belly. The sides of the head are black with white narrow superciliary stripes; and the throat, neck and breast are also black, with a white collar running nearly up to the eye stripes. In the females, the throat is white.

Another common species, which will be recognised at a glance, is the white-crested ant-thrush, *Pithys albifrons*, which is about 5 inches in length. The nape, rump, tail and under side, are chestnut-coloured, but the chief features which will claim attention, are the white elongated feathers of the head and throat, those of the head forming a very prominent crest. Curiously enough the females are similar to the males.

Generally distributed with the preceding species will be found another white-collared ant-thrush, with rufous mottlings, *Rhopoterpe torquata*, which is somewhat more than 5 inches in length. In this form the legs are strong and short; the tail is short; the wings

are elongated, and the bill stronger and elongated. The general colour is olive-brown with ruddy mottlings above, passing into grey below; the sides of the head marked with fine white spots; the quills of the wings and the coverts spotted with yellowish-white, while the throat and neck are black-bordered with an irregular white collar in the males, and of a clear ruddy colour in the females.

Another common form which is closely related to the foregoing species, but is easily distinguished by its much greater size, is the black-fronted ant-thrush, *Formicarius nigrifrons*. This bird is about $6\frac{1}{2}$ inches in length. Its general colour is olive-brown, the sides of the head and the body as far as the breast being black. The top of the head is chestnut-coloured, and the front black.

Three other species of this family, of the genus Grallaria, call for notice, which while they recall some of the features of the mottled, white-collared ant-thrushes, are strikingly like the breves of the Old World in many of their external characters. The tails are quite short, and the legs strong and long, perfectly adapting them to a terrestial mode of life.

One form, the giant ant-thrush, *Grallaria varia*, is considerably larger than the other two, reaching a length of about 7 inches. It has thus been termed the "king of the ant-birds." Its colour varies from

olive-brown above, with dark margins to the feathers, to chocolate-brown below, with light shaft-stripes. The sides of the throat are marked by a broad white line, and the breast by a white-striped collar.

The other two forms are about five inches in length. In one, *Grallaria brevicauda*, the upper surface is ruddy-brown, and the under suface white, the breast and belly obscurely marked with grey; while in the other, *Grallaria macularia*, the upper surface is olive-brown, and the under surface white, the breast being thickly spotted with black. In the latter species, too, the top of the head is ashy, and a rim round the eye of a rufous tint.

These three species of Grallaria are never found on the coast, but in the forest districts generally, and in the bushy clumps adjoining the savannahs, and the grass covered mountains. Though they appear to be common in the colony, they are not often obtained, being shy and very rapid in their movements among the under bush of the forest, and the surface debris in which they quickly secure shelter. Very occasionally they are met with in confinement in the settlements of the aboriginal Indians.

INDEX.

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

X

Y

Z