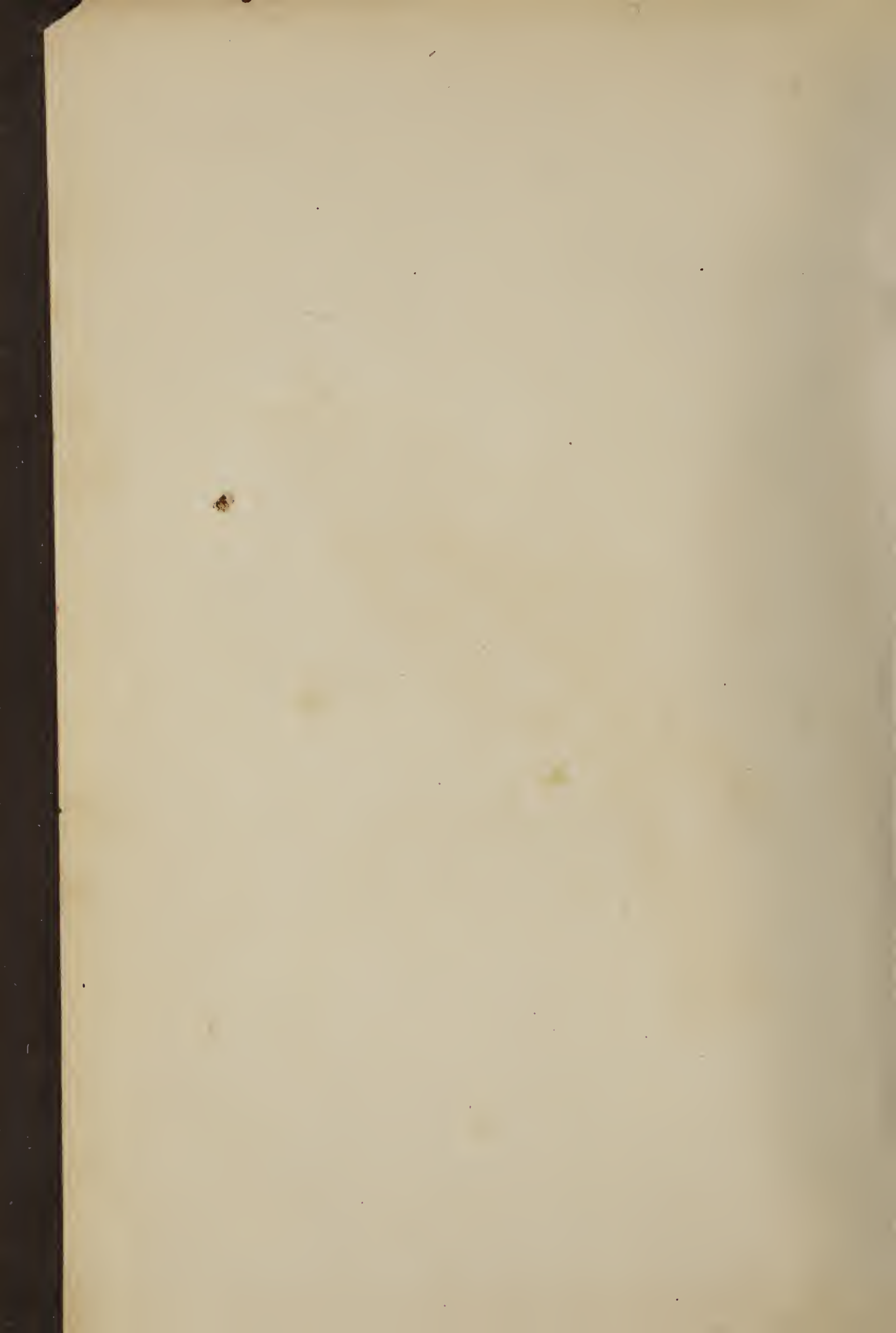




CASSELL'S
BOOK OF
BIRDS





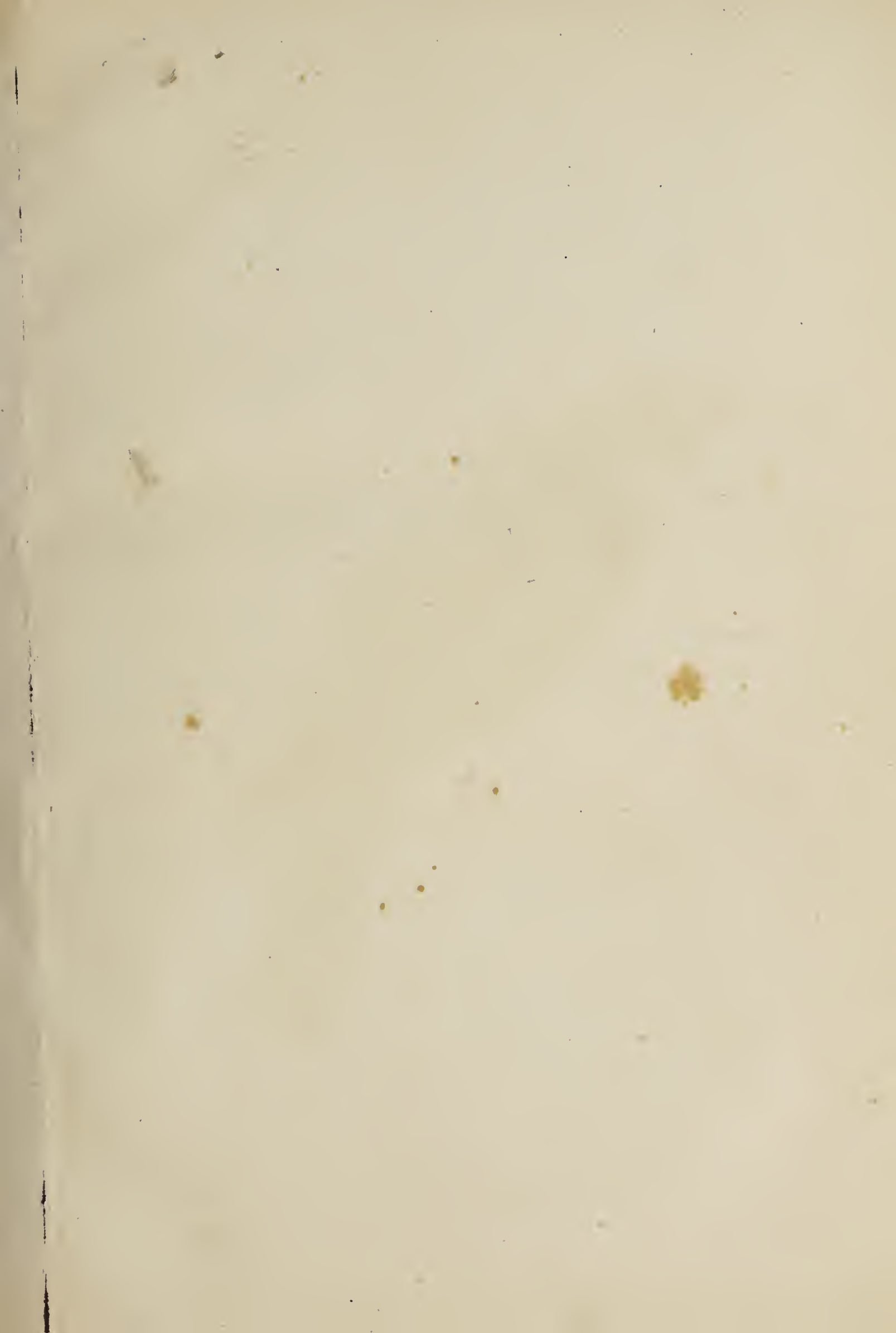




Plate 21, Cassell's Book of Birds

THE BLUE GRANDALA _____ *Grandala Coelicolor*
• *about 2/3 Nat size*

Zool
Aves
B.

Brehm, Alfred Edmund

CASSELL'S
BOOK OF BIRDS.

[Tr.] FROM THE TEXT OF DR. BREHM.

[edited]

BY

THOMAS RYMER JONES, F.R.S.,

PROFESSOR OF NATURAL HISTORY AND COMPARATIVE ANATOMY IN KING'S COLLEGE, LONDON.

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CASSELL'S
BOOK OF BIRDS.

THE SEARCHERS (*Investigators*).

THE families which, according to natural arrangement, seem to constitute a third division of the great class of birds are principally characterised by the conditions under which they procure their food, viz., by searching for it in situations where it can only be obtained by diligent investigation or laborious exertion. Their diet is usually of a very mixed description, consisting partly of insects and partly of materials derived from the vegetable creation. Many of them were at one time considered to subsist entirely upon the honeyed juices of the fruits and blossoms, among which they spend the greater part of their lives; and, although it is now generally admitted that the insects which abound in the nectared chalice whence they draw their supplies constitute a principal article of their nutriment, they are not the less on that account to be regarded as riflers of the saccharine stores laid up for their use in many a beautiful cup temptingly held forth for their enjoyment. Such are the Honeysuckers and the gorgeously decorated Humming Birds, whose sumptuous garb would seem literally intended to "gild refined gold and paint the lily." A second important group, constituted likewise for the purpose of preying upon insects, has been specially adapted to climb the trunks of trees in search of the innumerable hosts of destroyers that lurk beneath the bark, or in the crevices of wood in progress of decay. These constitute an extensive family, well exemplified by the Woodpeckers; while others, furnished with beaks and feet of very diverse structure, search everywhere for the particular kind of nourishment upon which they are destined to subsist.

The name we have selected for this extensive division of the feathered creation was first employed by Reichenbach, although not exactly in the same sense as that in which we are going to apply the term, neither can we hit upon any single character whereby all the species included under this denomination can be easily designated; nevertheless, however they may differ among themselves, there is a certain conformity in their structure, and a general resemblance in their habits, which will probably be appreciated when we have put the reader in possession of the details contained in the following pages.

We shall, therefore, at once commence their history, by describing them under the following headings.

THE CLIMBERS.

The CLIMBING BIRDS (*Scansor*) are for the most part recognisable by their slender though powerful body, short neck, and large head. The long or medium-sized beak is either strong and

conical, or weak and of a curved form; the feet are short, and the long toes either arranged in pairs or placed together in the usual manner, and armed with long, hooked, and sharp claws. The moderate-sized wing, which is usually rounded at its extremity, and occasionally of great breadth, is never slender or pointed; the formation of the tail is very various. Anything like a general description of the plumage possessed by the different groups of this order would be impossible; some, glittering with gay and even resplendent colours, dart through the air like living gems, whilst others are clad in such dull and sombre livery as to be scarcely distinguishable from the earth or trees upon which they are formed to live. The various representatives of the *Scansor* may be said to occupy almost every region of our earth; some groups are migratory, and leave their native lands annually with the utmost regularity, whilst others remain throughout the entire year within a certain limited district. Woods and forests are the localities principally occupied by these birds, though they are by no means incapable of ascending rocks, or seeking for their food upon the ground, over the surface of which they run with considerable facility. Their flight is good, but it is upon the trees alone that the *Scansor* exhibit the full beauty and ease of their movements. All the members of this order consume insects, and many devour fruit, berries, seeds, honey, and the pollen of plants. As regards their powers of song, they are by no means gifted; indeed, the most highly endowed amongst them rarely rise above the utterance of a few pleasing notes during the breeding season. The construction of the nests of the *Scansor* varies so considerably that we shall confine ourselves to speaking of them in their appropriate places.

It is usual among systematic writers to associate many of the birds which we have included in the present order as slender-billed forms of one or other of the preceding divisions, more especially those usually denominated TENUIROSTRES, and perhaps we shall be harshly judged for our departure from the usual custom; be that as it may, the resemblance between some of the Climbing Birds and some Singing Birds is undeniable, and it is upon that ground that we treat of them in this place.

The TENUIROSTRAL species are distinguishable from all others by the slenderness of their beak, which is usually more or less curved, and by the feebleness of their feet, the toes of which are not arranged in pairs. They may be grouped as follows:—

The FLOWER BIRDS (*Certhiola*) constitute a small group of South American species, remarkable for the great beauty of their plumage. All possess a slender body, moderate-sized wing, containing nine primaries (of which the second, third, and fourth are the longest), and a somewhat soft-feathered tail, of medium length. The beak is also of moderate size, much arched at its base, and curved slightly inwards at its margins. The tongue is long, divided, and thread-like at its tip, but not protrusible; the foot is short and powerful. The sexes are readily distinguishable by the diversity of their coloration, the plumage of the male being blue, and that of the female usually green. All the members of this group closely resemble our singing birds in their habits and mode of life; they subsist upon insects, seeds, corn, and berries, in pursuit of which they hop from branch to branch, with ever restless activity. According to the Prince von Wied, they regard fruit of various kinds, particularly oranges, with especial favour, and, when these are ripe, constantly venture into the gardens, even close to dwelling-houses, with all the fearlessness of the Domestic Sparrow; at other seasons they prefer to keep within the shelter of well-wooded thickets. Their song, we believe, consists of but a single note.

The BLUE BIRDS (*Cereba*) are at once recognisable by their long, thin beak, which is compressed at its sides, and slightly notched near its very sharp tip; the wing is long and pointed, its

second and third quills, which are of equal size, exceeding the rest in length. The moderate-sized tail is straight at its extremity; the legs are weak, and the tongue, which is tolerably long, composed of two lobes, terminating in fringed margins.

THE SAI, OR BLUE CAEREBA.

The SAI, or BLUE CAEREBA (*Cæreba cyanea*). The prevailing colour of this beautiful species is a brilliant light blue, shading towards the top of the head into resplendent blueish green; the upper part of the back, wings, and tail, as well as a stripe surrounding the eye, are black, and the inner margins of the wings yellow. The eye is greyish brown, the beak and foot bright orange-red. The



THE SAI, OR BLUE CAEREBA (*Cæreba cyanea*).

plumage of the female is siskin-green on the upper parts of the body, and pale green beneath; the throat is whitish. The length of this species is four inches and two-thirds, the wing measures two inches and a quarter, and the tail one inch and a quarter.

These beautiful birds are met with throughout the greater part of South America, and are especially numerous about Espírito Santo. The Prince von Wied found them in large numbers inhabiting the forests near the coast, and tells us, that except during the breeding season, they live in small parties of six or eight, which disport themselves among the topmost branches of the trees, frequently associating with Tangaras, and such other of the feathered inhabitants of their leafy retreats as are about their own size. Fruit, seeds, and insects constitute their principal means of subsistence, and in pursuit of these they display an agility and dexterity fully equalling that of our own Titmouse. The voice of the Sai is only capable of producing a gentle twitter. Schomburghk mentions that large numbers of a very similar species are destroyed by the natives, who employ the gay and glossy feathers as personal ornaments.

The PITPITS (*Certhiola*) have a high slender beak, which curves gently towards its sharp tip; their wings are long, their tail short, and their tongue divided into two parts, each of which terminates in a brush of thread-like fibres.

THE BANANA QUIT, OR BLACK AND YELLOW CREEPER.

The BANANA QUIT, OR BLACK AND YELLOW CREEPER (*Certhiola flaveola*), is blackish brown on the upper parts of the body, and of a beautiful bright yellow on the under side and rump; a line that passes above the eyes, the anterior borders of the primary quills, the tips of the tail, and its two outer feathers are white; the throat is ash-grey, the eye greyish brown, the back is black, and the foot



THE BANANA QUIT (*Certhiola flaveola*).

brown. The female is blackish olive on the back, and pale yellow on the under side; in other respects her plumage resembles that of her mate. The length of this species is three inches and five-sixths; the wing measures two inches and one-sixth, and the tail one inch.

“Scarcely larger than the average size of Humming Birds,” writes Mr. Gosse, “this little Creeper is often seen in company with them, probing the same flowers, and for the same purpose, but in a very different manner. Instead of hovering in front of each blossom, a task to which his short wings would be utterly incompetent, the Quit alights on the tree, and proceeds in most business-like manner to peep into the flowers, hopping actively from twig to twig, and throwing his body into all positions, often clinging by his feet with his head downwards, the better to reach the blossoms with his curved beak and pencilled tongue; the minute insects which are concealed in the flowers are always the objects of his search. Unsuspectingly familiar, these birds resort much to the blossoming shrubs of enclosed gardens. The soft, sibilant note of the Quit is often uttered while the bird peeps about for food. The nest is frequently built in those low trees and bushes from whose twigs depend the

paper nests of the brown wasps, and in close contiguity with them. On the 4th of May, as I was riding to Savannah-le-Mar, I observed a Banana Quit with a bit of silk cotton in her beak, and, on searching, found a nest just commenced in a sage bush (*Lautana camara*). The structure, though incomplete, was evidently about to be a dome, and so far was entirely constructed of silk-cotton. A nest now before me is in the form of a globe, with a small opening in the side. The walls are very thick, composed of dry grass, intermixed irregularly with the down of *Asclepias*. This nest I found between the twigs of a branch of *Bauhinia* that projected over the high road, near Content, in St. Elizabeth's. The two eggs were greenish white, thickly but indefinitely dashed with red at the broad end."



THE ABU-RISCH (*Hedydipna metallica*).

In the Eastern Hemisphere the Flower Birds are represented by—

The HONEYSUCKERS (*Nectarinia*). These are small and delicately-constructed birds, adorned with plumage of the most brilliant hues; their body is compact, their beak thin, slightly curved, and sharply pointed. The moderately long wing contains ten primary quills. The formation of the tail is very varied, being either straight, rounded, or wedge-shaped at its extremity; its two centre feathers occasionally extend considerably beyond the rest. The tongue is long, very protrusible, and divided at its tip; the feet are high, and the toes slender. The coloration of the plumage varies not only in the two sexes, but also at different seasons; the feathers are moulted twice in the year, and only exhibit their gay tints during the period of incubation; towards the end of the season the males are clad in the same sombre hues that belong to the females and young. The Honey-suckers inhabit the whole of Africa, Asia, and Oceania, the first-mentioned continent being especially rich in species. Everywhere their glowing colours entitle them to be regarded as the

most striking ornaments of the woods, groves, or gardens they inhabit, whilst their intelligence renders the study of their habits extremely interesting. During the greatest part of the year they live in pairs, which occasionally associate into small parties during the breeding season. The nests of the Honeysuckers are constructed with great skill, and are usually suspended from thin branches or twigs. The eggs, which are few in number, are of a pure white.

THE ABU-RISCH.

The ABU-RISCH (*Hedydipna metallica*) represents a group recognisable by their slightly-curved beak, scarcely equalling the head in length; their comparatively short wings, in which the second, third, fourth, and fifth quills are of equal length; and their wedge-shaped tail, the two centre feathers of which are usually considerably prolonged. The male is of a metallic green on the head, throat, back, and shoulder-covers; the under side is bright yellow, a line upon the breast and the rump have a violet sheen; the quills and tail-feathers are blackish blue, the eye brown, and the beak and feet black. The back of the female is of a light olive-brown, and her under side sulphur-yellow; her quills and tail-feathers have light edges. The young resemble the mother, but are of a paler hue. The length of this species is six inches, of which three and a half belong to the centre tail-feathers, the rest do not exceed thirteen and a quarter; the wings measure two inches and one-sixth. The Abu-Risch is met with in all such parts of Africa as afford it the shelter of its favourite mimosa-trees, upon and around which it may literally be said to spend its whole existence. Early in the morning, and towards the close of the day, it usually perches quietly among the branches, and only displays its full vivacity during the noontide heat, when it flutters rapidly from blossom to blossom, in search of food, singing and chirping briskly as it flies in cheerful companionship with its almost inseparable mate. The song of the male is pleasing, and accompanied by a great variety of gesticulations and attitudes, calculated to exhibit his crest and plumage in all their varied beauty to the admiring gaze of the female, who usually endeavours to imitate her partner, but, owing to the comparative dullness of her colours, with a far less imposing result. In Southern Nubia the breeding season commences in March or April. The nest, which is variously formed, is neatly and skilfully woven with cotton-wool and similar materials, and lined with hair or spiders' webs. This pretty little structure is usually suspended from the end of a branch, at no great height from the ground, and is entered by an aperture at the side, frequently so situated that the leaves of the branch overhang and shade the entrance hole. Both parents work busily in constructing this snug apartment for their young, and have seldom completed their labours in less than a fortnight's time. The eggs, which are oval in shape, and white, are incubated by the female alone.

The FIRE HONEYSUCKERS (*Æthopyga*), the Indian representatives of the above group, are recognisable by the comparative thinness of their short but distinctly curved beak. In their wings the fourth quill exceeds the rest in length; the tail is wedge-shaped at its sides, and furnished with two long and slender feathers in its centre. The plumage of the male is enlivened by brightly-tinted stripes on the cheeks, while that of the female is sombre, and almost of uniform tint.

THE CADET.

The CADET (*Æthopyga miles*), one of the most beautiful members of this family, is blood-red on the back; the throat and upper part of the breast are of a somewhat paler crimson; the top of the head is violet, with a bright, metallic, green lustre. The nape is deep olive-yellow, and the belly pale greenish yellow; a steel-blue line, that becomes gradually broader, passes from the corners of the mouth to the sides of the neck; the quills are brown, edged with olive; the two centre tail-feathers

are glossy violet-green, and those of the exterior brown, with a purple sheen on the outer web. The eye is dark brown, the upper mandible black, the lower one brown, and the foot greyish black. The female is olive-green on the back, and yellowish green on the under side. The wing measures two inches and three-eighths, and the tail three inches.

The Cadet inhabits the northern and eastern parts of India, and is often met with in the Himalayas at an altitude of 2,500 feet above the level of the sea.

The BENT-BEAKS (*Cyrtostomus*) are distinguishable by their very decidedly curved beak, which equals the head in length, is blunt at its margins, and slightly incised towards its very sharp tip; the tarsus is comparatively high, the tail short and rounded, and the wings, in which the fourth and fifth quills are the longest, of moderate size. The plumage is of an olive-green on the upper parts of the body, and brightly coloured in the region of the throat.

THE AUSTRALIAN BLOSSOM RIFLER.

The AUSTRALIAN BLOSSOM RIFLER (*Cyrtostomus Australis*) is olive-green on the back, and of a beautiful bright yellow on the under side; the throat and upper breast are steel-blue. A short yellow streak passes over the eyes, and beneath this runs a long line of deeper shade; the eye is chestnut-brown, and the beak and feet black. The female is of an uniform yellow on the under side. According to Gould, the body of this species measures four inches and three-quarters, the wing two inches and one-eighth, and the tail two inches and a half.

“This pretty bird,” says Macgillivray, as quoted by Gould, “appears to be distributed along the whole coast of Australia, the adjacent islands, and the whole of the islands in Jones’s Straits. Although thus generally distributed, it is nowhere numerous, seldom more than a pair being seen together. Its habits resemble those of the *Ptilotes*, with which it often associates, but still more closely those of the *Myzomela azura*; like those birds, it resorts to the flowering trees, to feed upon the insects which frequent the blossoms, especially those of a species of *Sciodophyllum*. This singular tree, whose range on the north-eastern coast and that of the Australian Sun Bird appears to be the same, is furnished with enormous spike-like racemes of small scarlet flowers, which attract numbers of insects, and thus furnish an abundant supply of appropriate food. The Blossom Rifler is of a pugnacious disposition, as I have more than once seen; it drives away and pursues any visitor to the same tree. Perhaps this disposition is only exhibited during the breeding season. The nests we found at Cape York were pensive, and attached to the twig of a prickly bush; one, measuring seven inches in length, was of an elongated shape, with a rather large opening on one side, close to the top; it was composed of shreds of *Melaleuca* bark, a few leaves, various fibrous substances, rejectamenta of caterpillars, &c., and lined with the silky cotton of the *Bombyx Australis*. The eggs were pear-shaped, mottled with dirty brown, on a greenish grey ground. Another nest, found at Mount Ernest, Jones’s Straits, differs from those seen in Cape York, in having over the entrance a projecting fringe-like hood, composed of the panicles of a delicate grass-like plant. It contained two young birds, and I saw the mother visit them twice in an interval of ten minutes. She glanced past like an arrow, perched at once on the nest, clinging to the lower side of the entrance, and looked round very watchfully for a few seconds before feeding the young, after which she disappeared as suddenly as she arrived.”

The SPIDER-EATERS (*Arachnothera*) are short, compactly-built birds, with extraordinarily long and often strangely-formed beaks, which in most species are very decidedly curved and delicately incised at the margins. The nostrils are covered with a skin, and only open inferiorly,

where they terminate in a horizontal slit-shaped aperture. The thread-like tongue, which is very long, and greatly resembles that of a butterfly, consists of two fine tubes, which run side by side, and are closely connected along their under surface; a longitudinal groove is interposed between them above. The arrangement of the bones at the base of the tongue, whereby the lingual apparatus is capable of considerable protrusion, is very similar to that observable in the Woodpecker. The feet are powerful, but of medium length, and the wings (in which the fourth quill is the longest) are of moderate size. The sexes are very similar in the coloration of their plumage, in which brownish green, and more or less lively yellow, grey, or green, predominate.

The Spider-eaters usually frequent the most shady retreats in their favourite woods, and but rarely ascend the branches to more than fifteen or twenty feet from the ground. In the Sunda Islands they are principally met with in the coffee plantations, the brushwood that skirts the mountains, or in the thickets of trees and shrubs that surround the villages. In all these situations they are numerous, and are constantly to be seen as they flit from flower to flower in search of the insects and honey upon which they subsist. Small spiders are said to be eagerly devoured by all the members of this family, hence their name of *Arachnothera*. The flight of the Spider-eaters, which is extremely rapid, and in many respects like that of the Woodpecker, is observed by the natives with a superstitious attention, fully equalling the reverence paid by the Romans to the predictions drawn by their augurs from a similar source.

The HALF-BILLS (*Hemignathus*) are a group of Spider-eaters that are easily recognisable by the strange formation of their beak; the upper mandible terminates in a sharp point, and is always much longer than the under portion of the bill, sometimes twice its length. The toes, also, are comparatively long, and the foot short. The plumage is usually green upon the back, and of a yellowish tint beneath. All the members of this group inhabit Oceania.

THE BRILLIANT HALF-BILL.

The BRILLIANT HALF-BILL (*Hemignathus lucidus*), one of the most beautiful members of this group, is olive-green upon the entire mantle, shading into grass-green on the top of the head and at the edges of the wings. A stripe over the eyes, and the sides of the head and throat are orange-red; the breast is bright yellow, the belly of a paler shade, and its lower portion greenish grey. In young birds the back and region of the eye are olive-green, the under side light greenish grey, and the belly pale yellow. This species is six inches long, but of this measurement one inch and three-quarters belong to the tail, and one inch and a quarter to the beak; the lower mandible does not exceed eight lines in length. We are without particulars as to the life of this bird, except that it inhabits the Pisang plantations.

The HANGING BIRDS (*Arachnocestra*) are recognised by the great length of their slightly-curved beak, the base of which is as broad as it is high; the upper mandible is delicately incised, and the entire bill of almost equal thickness, only tapering gently towards the extremity; the legs are slender, the toes long, and the wings (in which the fourth, fifth, and sixth quills exceed the rest in length) of moderate size; the tail is short and rounded.

THE TRUE HANGING BIRDS.

The TRUE HANGING BIRDS (*Arachnocestra longirostris*) are olive-green on the back, and sulphur-yellow on the under side; the throat and upper breast are white, the quills and tail-feathers deep brown, the former edged with olive, and the three outer tail-feathers tipped with white; the beak and

feet are blackish grey. This species is six inches and a half long, the wing measures two inches and two-thirds, and the tail one inch and three-quarters.

These birds frequent banana plantations, and usually betray their presence by their shrill chirping cry. Were it not for the constant repetition of their note they would rarely be observed, as the hues of their plumage render it almost impossible to detect them among the foliage. We learn from Bernstein that their manner of building is very remarkable. The oval-shaped nest, some six or seven inches long, and three or four inches broad, is attached by threads to a large leaf, in such a manner that the latter forms the fourth side. Fine grass and fibres are employed for the interior, and half-decayed leaves, of which little more than the fibrous portion remains, are used for the outer wall,



THE HANGING BIRD (*Arachnocestra longirostris*).

so that, when completed, the curious structure has rather the appearance of a substantial spider's web than of a bird's nest. The entrance is at one end. The eggs, two in number, are pure white, spotted with reddish brown at the broad extremity.

The HONEY-EATERS (*Meliphaga*) have a long, slender, slightly-curved beak, the upper mandible of which extends considerably beyond the lower portion. The feet are strong but moderate-sized, and furnished with powerful hinder toes; the wing, also moderate, is rounded, its fourth quill being the longest; the tail varies in its dimensions, but is usually rounded at its extremity; the nostrils are concealed by a cartilaginous skin; the gape is narrow, and the tongue provided with a tuft of delicate fibrous bristles at its tip. The stomach is very small, and but slightly muscular. The plumage, which differs little in the two sexes, varies considerably in different species. In some it is thick, variegated, and much developed in the region of the ear, in others smooth, compact, and of almost uniform colour.

All the Honey-eaters are of a lively and restless disposition, and exhibit the utmost activity both when running upon the ground or climbing amongst the branches ; in the latter case, especially, their movements are extremely agile. They are constantly to be seen hanging head downwards from the twigs, whilst engaged in busily searching under the leaves for insects, and in extracting honey from the flowers. Some species fly well, and disport themselves freely in the realms of air, whilst others are incapable of continuing their undulatory flight for more than a short distance. The voice of all is rich and varied, indeed, some members of the group may be regarded as really good singers. Few species are social in their habits ; they keep together only in pairs, even when of necessity compelled to take up their abode near each other. Towards man they show the utmost confidence, and come freely down into streets and dwellings ; indeed, they exhibit no timidity even towards the more formidable of the feathered kind. Instances have been frequently recorded in which they have boldly opposed Crows, Falcons, and other large birds. Their nests are variously constructed, and the number of eggs is always small.

The TRUE HONEY-EATERS (*Myzomela*) are small birds, with delicate, much curved beaks, powerful feet, and moderate-sized wings and tail. The latter is either straight or slightly incised at its extremity. The plumage is remarkable for its brilliancy.

THE RED-HEADED HONEY-EATER.

The RED-HEADED HONEY-EATER (*Myzomela erythrocephala*) is a beautiful species, bright scarlet upon the head, throat, and rump ; the tail and a band upon the breast are chocolate-brown ; the lower breast and belly are brownish yellow, the eye is reddish brown, the beak olive-brown, and the foot olive-grey. The female is brown above, and light fawn-colour on the under side. The length of this species is four inches and a half. The wing measures two inches and a quarter, and the tail one inch and three-quarters.

This magnificent little bird frequents the groves and groups of almond-trees that abound in the northern parts of Australia, and enlivens its favourite haunts as much by the briskness and activity of its movements as by the brightness of its plumage. Its voice is sharp and twittering. We are entirely without particulars of the manner in which incubation is carried on.

The TUFTED HONEY-EATERS (*Ptilotis*) are remarkable for the unusual development of the feathers in the region of the ear. Their body is elongate, their wings short, and tail long. The strong, slightly-curved beak is short, and the foot of moderate size.

THE YELLOW-THROATED TUFTED HONEY-EATER.

The YELLOW-THROATED TUFTED HONEY-EATER (*Ptilotis flavigula*) is yellowish green on the back, wings, and tail. The dark grey under side glistens with a silver sheen ; the belly and sides are pale olive, the top of the head dark grey, and the throat bright yellow. The feathers that compose the ear-tufts are tipped with yellow, and the outer web of the quills is deep brown. The eye is brown, the beak black, and the foot lead-grey ; the gullet and tongue are of a brilliant orange-red. The length of this bird is eight inches ; the wing measures four inches and a half, and the tail four inches and a quarter.

“This fine and conspicuous species,” says Gould, “is abundant in all the ravines around Hobart Town, and is very generally spread over the whole of Van Dieman’s Land, to which island I believe it to be exclusively confined. It is very animated and sprightly, extremely quick in its actions, elegant in its form, and graceful in all its movements ; but as its colouring assimilates in a remarkable

degree with that of the foliage it frequents, it is somewhat difficult of detection. When engaged in searching for food, it frequently expands its wings and tail, creeps and climbs among the branches in a variety of beautiful attitudes, and often suspends itself to the extreme ends of the outermost twigs. It occasionally perches on the branches of trees, but is mostly to be met with in dense thickets. It flies in an undulating manner, like a Woodpecker, but this power is rarely exercised. Its note is a full, loud, powerful, and melodious call. The stomach is muscular, but of very small size, and the food consists of bees, wasps, and other hymenoptera, also of coleoptera of various kinds, and the pollen of flowers. It is a very early breeder, as is proved by my finding a nest containing two young birds covered with down, and about two days old, on the 27th of September. The nest, which is generally placed in a low bush, differs considerably from those of all other Honey-eaters with which I am acquainted, particularly in the character of the material forming the lining. It is the largest and warmest of all, and is usually formed of ribbons of stringy bark, mixed with grass, and the cocoons of spiders; towards the cavity it is more neatly built, and is lined internally with opossum's or kangaroo's fur. In some instances the hair-like material from the base of the large leaf-stalks of the tree-fern is employed for the lining, and in others there is merely a flooring of wiry grasses or fine twigs. The eggs, which are either two or three in number, are of the most delicate fleshy buff, rather strongly but sparsely spotted with small prominent roundish dots of chestnut-red, intermingled with which are a few indistinct spots of purplish grey. The average length of the egg is eleven lines, and the breadth eight lines."

The BRUSH WATTLE BIRDS (*Melichæra*) are recognisable by their powerful body, strong and slightly curved beak, comparatively short foot, short rounded wing, and long, wedge-shaped, tapering tail.

THE TRUE BRUSH WATTLE BIRD.

The TRUE BRUSH WATTLE BIRD (*Melichæra mellivora*) is deep brownish grey on the back, each feather having a white stripe in the centre. The feathers on the throat and breast are brown, tipped with white; the rest of the under side appears lighter than the back, owing to the greater size of the white shaft-stripe. The upper quills are chestnut-brown on the inner web, and the rest brown tipped with white, as are the tail-feathers. The eye is grey, the beak black, and the foot brown. This species is about eleven inches long; the wing measures four inches and a quarter, and the tail five inches and one-sixth.

These birds inhabit all such parts of Tasmania, New South Wales, and South Australia as offer them the shelter of their favourite Banksias. Everywhere they are numerous, and display the utmost confidence and fearlessness towards man. In disposition they are lively, active, and so pugnacious as to live in a state of constant warfare with all their feathered companions. "The Brush Wattle Bird," says Gould, "is a bold and spirited species, evincing a considerable degree of pugnacity, fearlessly attacking and driving away all other birds from the part of the tree on which it is feeding, and there are few of the Honey-eaters whose actions are more sprightly and animated. During the months of spring the male perches on some elevated branch, and screams forth its harsh and peculiar notes, which have not unaptly been said to resemble a person in the act of vomiting; whence the Australian name of 'Goo-gwar-ruck,' in which the natives have endeavoured to imitate these very singular sounds. While thus employed, it frequently jerks up its tail, throws up its head, and distends its throat, as if great exertion were required to force out these harsh and guttural sounds. The Banksias are in blossom during the greater portion of the year, and the early flower, as it expands, is diligently examined by the Wattle Bird, which inserts its long feathery tongue into the interstices of

every part, extracting the pollen and insects, in searching for which it clings to and hangs about the blossoms in every variety of position. The breeding season commences in September, and lasts for three months. The very small nest is round in shape, open at the top, and formed of delicate twigs and fibres. This pretty little structure is usually placed in the fork of a branch, at the height of a few feet from the ground. The two or three eggs are bright red, spotted slightly with dark brown; these markings are most numerous at the broad end."

THE POE, OR TUI.

The POE, or TUI (*Prothemadera circinata*), is readily distinguished by the two remarkable tufts of feathers that decorate each side of the throat; in other respects its formation closely resembles that of its congeners. The coloration of the plumage is principally of a deep metallic green, which appears black in some lights, and in others shines like bronze. The back is umber-brown, but glistens with the same varying shades. A white line passes over the shoulders, and the long feathers on the nape are enlivened by white streaks upon the shafts. The strange tufts on the sides of the throat to which we have alluded are pure white, and form a dazzling contrast to the dark plumage by which they are surrounded. The belly is deep umber-brown; the quills and tail-feathers black, very glossy and resplendent above, and quite lustreless on the lower side. This species is twelve inches long. The wing measures five inches and a half, and the tail four inches and a half. Layard tells us that of all the feathered inhabitants of the New Zealand forests the Poe is most certain to attract the notice of the traveller, as it flutters noisily from branch to branch, or sails in airy circles over the tree tops. It is not uncommon to see eight or ten of these birds at a time turning somersaults as they circle after each other, or rise and sink with outspread wings and tail, until at last they return to seek repose after their gambols under the sheltering branches of the trees. The Poe has been frequently described as the most wonderful of songsters, and some writers have gone so far as to declare that its performance far exceeds that of the Nightingale, both in beauty of tone and clearness of execution. Such accounts as these are, in our opinion, much exaggerated, though we admit that it certainly ranks with the finest songsters inhabiting Australia. The food of the Poe, we are told, consists of insects, in search of which it exhibits a very restless activity. It also devours berries and earth-worms. This species possesses a most wonderful talent for imitating the notes of all the feathered inhabitants of the woods; hence it is sometimes called the Mocking Bird. In confinement it also learns to mimic other sounds, such as the noises of dogs, cats, or poultry, and readily pronounces long sentences with great correctness.

The FRIAR BIRDS (*Tropidorhynchus*) are recognisable from all their congeners by a knob at the base of the upper mandible, a bare place on the head and throat, and the long feathers that adorn the nape or breast. The tongue is provided at its extremity with a double brush-like appendage.

THE "LEATHERHEAD."

The "LEATHERHEAD" (*Tropidorhynchus corniculatus*) is greyish brown on the back and brownish grey upon the under side, a long lancet-shaped feather on the breast, and the chin-feathers, are of a pure glossy white, delicately spotted with brown; the tail is tipped with white. The eye is red, but turns brown after death; the beak, and some bare places on the head, are of silky blackness, and the feet lead-grey. The female is smaller than her mate, and the young are distinguishable from the adult birds by the inferior size of the knob on the beak and of the breast-feathers; the bare places on the head are also smaller. This species is about twelve inches long, the wing measures five inches and three-quarters, and the tail four inches and two-thirds.

Gould tells us that in New South Wales these birds are very common during the summer, and are especially numerous in the thick brushwood near the coast. Their undulatory flight is strong, and their movements amongst the branches nimble and adroit; it is by no means uncommon to see them hanging head downwards from a branch to which they attach themselves solely by one of their powerful claws; such formidable use, indeed, do they make of these sharp weapons, that he who unwarily seizes a wounded bird is sure to receive a series of deep and really painful wounds in repayment of his temerity.



THE POE, OR TUI (*Prothemadera circinata*).

The strange cry of this species has been supposed to resemble the words, "Poor soldier," "Pimlico," and "Four o'clock," while the bare places on its head have procured for it the names of "Monk," "Friar," and "Leatherhead." Figs, berries, insects, and the pollen from the gum-tree blossoms constitute its favourite and principal means of existence. At the approach of the breeding season, which commences about November, the males become more than usually active and bold, chasing and doing battle with even the most formidable of their feathered brethren should they intrude upon the privacy of the brooding female. The comparatively large and cup-shaped nest is roughly formed of bark, twigs, and wool; the interior lined with more delicate materials. This structure is generally suspended from an upright branch of a gum or apple tree (*Angophora*), and is often found at but a few feet from the ground. In the well-wooded plains of Aberdeen and Yarrund, on the upper part of the Hunter, this species breeds in such numbers that the nests may almost be

described as forming settlements. The eggs, usually three in number, are pale red, delicately spotted with a deeper shade.

The HOOPOES (*Upupa*) may be regarded as the most aberrant of the Tenuirostral group. They are moderately large, and slenderly formed; their beak is long, slender, higher than it is broad, and in some species much curved; the small, oval, and open nostrils are situated immediately beneath the feathers that cover the brow; the strength of the foot varies considerably; the wings (in which the fourth and fifth quills are the longest) are much rounded; the tail, formed of ten feathers, is either short and straight at its extremity or long and graduated. The compact and variegated plumage differs considerably as to its coloration, and but little variety is observable between the two sexes.

THE HOOPOE.

The COMMON HOOPOE (*Upupa epops*) is recognisable by its elongate body; long, slender, slightly curved, and pointed beak (which is much compressed at its sides); and short powerful foot armed with blunt claws. The wing is decidedly rounded; the tail of moderate size, composed of broad feathers, and straight at its extremity. The soft, lax plumage, which is prolonged into a crest on the top of the head, is much variegated, and almost alike in the various species with which we are acquainted. Reddish brown of a more or less lively hue usually predominates in its coloration, while the wings and tail are striped with white. In the Common Hoopoe the upper portion of the body is of reddish brown, variegated with black and yellowish white on the middle of the back, and on the shoulder and wings. The crest is of a deep reddish yellow, tipped with black; the under side is bright reddish yellow, spotted with black on the sides of the belly; the black tail is striped with white about its centre. All the colours in the plumage of the female are duller than in that of her mate. The young are recognisable by the comparative smallness of their crest. The eye is deep brown, the beak greyish black, and the foot lead-grey. The length of this species is about ten and its breadth eighteen inches. The wing measures five, and the tail four inches.

The greater portion of Europe, Northern Africa, and Central Asia are inhabited by these birds, which are specially numerous in the more southern portions of those regions, and instances are recorded of stragglers having been seen as far north as the Loffoden Isles. In some of the central provinces of Europe they appear about the end of March, and leave again in pairs, or small parties, at the commencement of autumn. Such as inhabit North-eastern Africa do not migrate, but merely wander at certain seasons over the surface of the country. In Southern Europe these birds frequent the vineyards, but in North-eastern Africa they prefer the immediate vicinity of towns and villages, and render great benefits to the inhabitants by assisting the Vultures, whose proceedings we have already described, in their revolting but most valuable labours.

Anything like sociability is unknown to this bird; each lives for its mate or its family alone, and carries on a constant warfare with all its neighbours. Strange to say, however, if taken young from the nest they soon become extraordinarily tame, and learn to obey and follow those who feed them with all the fidelity and devotion of a favourite dog. Carrion, beetles, larvæ, caterpillars, ants, and many other kinds of insects are devoured by the Common Hoopoe in large numbers, its long beak enabling it to search for its victims in any hole or crevice into which they may have crept. Large beetles are killed by repeated blows, and by crushing them against the ground until the wings and feet have been broken off. The morsel is then tossed aloft and dextrously caught and swallowed. The young birds are at first unable to perform this rather difficult feat, and, therefore, require to be fed by those who may wish to rear them. It would appear that but little care or fastidiousness is exhibited in selecting a spot suitable for building their nests: trees, fissures in walls, houses, or holes in the

ground are indiscriminately employed; and Pallas mentions having found a nest containing seven young in the thorax of a human skeleton. Dry grass, roots, and cow-dung are the materials employed in the construction of the nest. The brood consists of from four to seven small elongate eggs, with a dirty greenish white or yellowish grey shell, occasionally finely spotted with white. The female alone broods, and the young are hatched in a fortnight. Both parents assist in the task of feeding their charge, and tend them with much affection; this care, however, does not extend to clearing away such daily accumulations as are usually removed, and the consequence is that before the family are fully fledged the nest has become a mere mass of seething flies and maggots, giving forth a stench from which the birds themselves are only freed after having been exposed for many successive days to the pure winds of heaven.

The TREE HOOPOES (*Irrisor*) inhabit the forests of Africa, and are recognisable by their slender body, long beak, short foot and wing, and long tail. The slightly-curved beak has a ridge at its margin, and is compressed at its sides. The powerful tarsus is much shorter than the centre toe, which, like the rest, is armed with a strong hooked claw. The fourth and fifth quills of the rounded wing exceed the rest in length; and the broad tail is much graduated. Those species with which we are familiar inhabit the forests of Central and Southern Africa, and pass their lives exclusively upon trees.

THE RED-BEAKED TREE HOOPOE.

The RED-BEAKED TREE HOOPOE (*Irrisor erythrorhynchus*). The prevailing colour of this species is a beautiful metallic blue, shimmering with dark green and purple. The inner web of the first three quills is decorated by a single white spot, whilst the six next in order have two white spots. The three first tail-feathers are similarly adorned, and are also marked with white near the tip. The eye is brown, and the beak and foot bright red. The female is smaller, and her plumage less glossy. The young are deep green, nearly black, and almost lustreless. This species is from seventeen to eighteen inches long, and eighteen inches and a half broad. The wing measures six, and the tail nine inches.

According to our own observations these beautiful birds principally inhabit the forests of North-eastern Africa, and are usually met with hopping or climbing incessantly from tree to tree, or bough to bough, in parties of from four to ten. These parties exhibit extraordinary unanimity in their manner of proceeding, and in all their movements seem to be playing an active game of follow-my-leader. Should one member of the little society suspend itself from a branch, all the rest immediately do the same; and even when uttering their cry as they rise into the air, the sounds are often so simultaneous that it is almost impossible to distinguish the individual voices. Ants and, according to some authorities, various kinds of insects, constitute their principal food. Few birds exhibit such strong attachment to their companions as we have frequently observed amongst groups of Tree Hoopoes; it is not uncommon for them to remain close together as though for mutual defence until repeated shots from the hunter's gun have brought one of the party to the ground, when the rest come rushing down, flapping their wings and uttering loud cries as they settle on the branches depending over the spot on which the victim lies. Despite the shortness of their legs, they run over the ground with tolerable ease. Their flight alternates between a gentle gliding motion and a series of rapid strokes with the pinions. Le Vaillant tells us that the female deposits her bluish green eggs, from four to six in number, at the bottom of a hole in a tree, and is assisted in the labour of incubation by her mate.

The TREE-CLIMBERS (*Anabata*) constitute a family of South American birds, with slender bodies, short wings, and long tails. Their straight or but slightly curved beak is strong, and of the

same length as the head. The tarsi are of medium height; the toes small, armed with short and slightly-curved claws. The fourth quill of the wings is the longest. The very decidedly graduated tail is composed of twelve short feathers. All the members of this family inhabit forest or woodland districts, and but rarely venture forth into the open country. Insects form almost exclusively their



THE HOOPOE (*Upupa epops*).

means of subsistence; and in search of these they climb the branches with an agility fully equalling that of the Titmouse. Many species are remarkable for the peculiarity and loudness of their cry. Their nests, which are usually suspended from the trees, and closed above, are frequently very striking in appearance.

The BUNDLE-NESTS (*Phacellodomus*) are recognisable by their short, almost straight beak, which is much compressed, and very slightly hooked towards its tip. The tarsi are high and strong; the wings rounded; and the broad tail formed of narrow, soft feathers.

THE RED-FRONTED BUNDLE-NEST, OR CLIMBING THRUSH.

The RED-FRONTED BUNDLE-NEST, or CLIMBING THRUSH (*Phacellodomus rufifrons*), is of a light brownish greenish grey on the upper parts of the body, and light brownish white on the under side. The quills are greyish brown, with a reddish gloss on the outer web; the brow is deep rust-red, and a stripe over the eyes pure white. The eye is grey, the upper mandible dark greyish brown, and the lower one whitish grey. The foot is pale blueish grey. This species measures six inches and a quarter, the wing two inches and a quarter, and the tail two inches and a half.

The Prince von Wied tells us he only met with these elegant little birds upon the arid interior



THE RED OVEN BIRD (*Furnarius rufus*).

highland tracts of Geroes and Bahia, where they inhabited the open country, and passed their time in hopping or flying from one bush or tree to another. As regards its nidification, the Prince von Wied remarks, "I found the nests of the *Phacellodomus rufifrons* about February; they were usually suspended on the low, slender branches of high trees. Those I saw are best described as large oval bundles, often more than three feet long, and formed of thin twigs heaped together and interwoven with each other, or fastened together by a variety of materials. The interior was filled with small bundles of moss, hair, wool, or fibres interlaced, so as to form a warm and compact lining. The small round hole that serves as an entrance is situated at the bottom of this suspended mass, so that the birds ascend from below into their huge domicile. Year by year these nests are added to and enlarged until at last it is not uncommon to find that they have so increased in size as to render it a difficult task for a man to stir one of them. On opening a nest of this description a row of chambers is seen, under the one last made. These ancient apartments are, we believe, frequently employed as

retiring-rooms for the male parent. Swainson tells us that these strange and shapeless masses are very conspicuous features in the landscape. The brood usually consists of four eggs, which are round in shape, and generally of a pure white.

The OVEN BIRDS (*Furnarius*) possess a moderately strong beak, either quite straight or slightly curved, compressed at its sides, and almost equalling the head in length; the blunt wing is of medium size, its third quill is the longest, while its first is considerably, and its second slightly shortened; the short tail is composed of soft feathers; the tarsus is high, and the toes strong; the claws are somewhat hooked, but only the first is of any considerable size. These birds frequent both open woodlands and inhabited districts; they live for the most part on the ground, as their powers of flight and climbing are very limited. Their voice is loud, harsh, and peculiar. The strange nests built by the members of this group, and from which their name is derived, have been described by Azara, the Prince von Wied, Burmeister, Darwin, and other writers. "After passing over the lofty chain of mountains that separate the well-wooded coasts of Brazil from the Campos, travellers are astonished at beholding large, melon-shaped masses of clay standing erect upon the branches of the high trees surrounding the settlers' houses. Were it not for the regularity of their size and shape, a stranger would at once pronounce these masses of clay to be nests built by the termite ants. On closer inspection of one of these the eye detects an oval-shaped hole at the side, and a little patience is rewarded by a sight of the actual inhabitant of this most remarkable nest as he slips in and out of the entrance to his strange abode. This bird, known to us as the *Furnarius rufus*, is called the João de Barro, or Clay Jack, by the Brazilians." We learn from Darwin that these nests are also placed in such exposed situations as the top of a post, a bare rock, or on a cactus, and are composed of mud and bits of straw. The strong, thick walls in shape precisely resemble an oven, or a depressed bee-hive. The opening is large, and directly in front; within the nest there is a partition, which reaches nearly to the roof, thus forming a passage or antechamber to the true nest.

THE RED OVEN BIRD.

The RED OVEN BIRD (*Furnarius rufus*) is about seven inches long and ten and a half broad; the wing measures three inches and three-quarters, and the tail three inches. The plumage is principally of a reddish yellow; the top of the head brownish red, and the quills brown; the under side is of a lighter tint, and the throat pale white; a bright reddish yellow stripe passes from the eyes to the back of the head; the quills are grey, the primaries edged with pale yellow towards their base, and the tail-feathers yellowish red; the eyes are yellowish brown, the beak brown, except at the whitish base of the lower mandible; the foot is also brown.

These strange birds live in pairs, and but rarely associate, even in small parties. Their food consists of insects and various kinds of seeds, the former, according to Burmeister, being always obtained from the surface of the ground, over which they run and hop with great facility. Nor are their movements less adroit amongst the branches, from whence their most peculiar cry is constantly to be heard as they disport themselves from bough to bough. These birds are regarded with great respect by the Brazilians, on account of a very strange but prevalent idea that they never proceed with their building operations on the Sabbath, a superstitious fancy that we need hardly say has been frequently disproved, but has no doubt arisen from the unusually short time required by this species to complete its remarkable and elaborate home.

"The nest of the Red Oven Bird," says Burmeister, "is usually constructed upon the branch of a tree, and occasionally upon house-tops, steeples, or similar situations. Both male and female unite in the labour of building, and form their nests of round pellets of mud, working each pellet

firmly into place, intermixed with small portions of plants, until the foundation is some eight or nine inches high. On each end of this groundwork the birds proceed to erect a side wall of such a form and height as to give the entire mass the appearance of a half-crescent: When this foundation is quite dry a second wall of similar shape is erected within the first. This again is left to dry, and so the work proceeds until the mass has assumed the proper dome-like form, and is six or seven inches in height, eight or nine inches long, and some four or five inches deep. The interior of this remarkable structure (which sometimes weighs as much as nine pounds) is entered by an oval-shaped hole at the side, and is neatly and warmly lined with hay, cotton, wool, feathers, or similar materials. The eggs, from two to four in number, have a white shell, and are incubated by both parents. The first brood is produced early in September, and a second later in the season.

The GROUND WOODPECKERS (*Geositta*) are birds with slender bodies, long, pointed wings, and short incised tails; the slightly curved beak is triangular at its base, and nearly equals the head in length; the legs are of medium height, the outer toes short, and the claws small.

THE BURROWING GROUND WOODPECKER.

The BURROWING GROUND WOODPECKER (*Geositta cunicularia*) is of a deep brown on the upper portions of the body and wings; the under side is pale brown, the throat whitish, breast spotted and striped with black, and the belly rust-red. The region of the eye is pale red, the shoulder-feathers have light edges, and the exterior quills are bordered and tipped with blackish brown, and shaded with red upon the inner web. The eye is brown, the beak whitish at its base and black towards its tip; the feet are blackish brown. According to Kittlitz these birds inhabit the barren plains of Chili and Patagonia, and are met with on the Bolivian Cordilleras to a height of from 3,500 to 4,500 feet above the level of the sea. We learn from the same authority that in its general habits the *Geositta cunicularia* closely resembles the Common Lark.

“The Casaeita, as this bird is called by the natives,” says Darwin, “builds its nest at the bottom of a narrow cylindrical hole, which is said to extend horizontally to nearly six feet under ground, in any low bank of sandy soil by the side of a wood or stream. Here, at Bahia Blanca, the walls of those I have seen are built of hardened mud. I noticed that a bank that enclosed the courtyard of the house where I lodged was penetrated by round holes in a score of places. On asking the owner the cause of this, he explained that they were made by the Casaeitas, several of which I afterwards saw at work. It is strange that though the birds were constantly flitting over the low wall they were evidently incapable of forming an idea as to its thickness, otherwise they would not have made so many vain attempts. I do not doubt that each bird as it came to daylight on the opposite side was greatly surprised at the marvellous fact.”

Gray tells us that this species is extremely tame, and almost constantly in motion. The stomachs of such as he examined contained the remains of beetles; whilst Kittlitz mentions having only found seeds and small stones. At certain seasons the call is a shrill, tremulous note.

The STAIR-BEAKS (*Xenops*) are a group of Brazilian birds, possessing a very peculiar formation of beak, the lower mandible being graduated upwards, whilst the upper portion of the bill is quite straight. The tail is formed of soft, rounded feathers, and the feet are powerful. We learn from the Prince von Wied that the members of this group associate in pairs, or small parties, and lead a very quiet, retired life within their native forests. Their food consists principally of insects, and whilst in search of these they tap upon the bark of the tree after the manner of the Woodpecker. According to our own experience they will also eat some kinds of nuts. The nest is usually placed in

a hole in a tree. The various species, as far as we have ascertained, have nothing striking or peculiar in their cry.

THE HAIRY-CHEEKED STAIR-BEAK.

The HAIRY-CHEEKED STAIR-BEAK (*Xenops genibarbis*), an inhabitant of the Brazilian forests, is olive-brown on the upper parts of the body, greyish brown beneath, and white on the breast; a yellowish white line passes over the eyes, and there is a white patch behind the ear; the wings are striped with two shades of brown; the centre tail-feathers are reddish brown, the rest become deeper in shade towards the exterior; the outermost are almost black, spotted with rust-red. The length of this species is about four inches; the wing measures two inches, and the tail one inch and a half.



THE HAIRY-CHEEKED STAIR-BEAK (*Xenops genibarbis*).

Numerous specimens of these birds were captured by Burmeister in the vicinity of Neufreieburg, where they came even into his garden, and ran gaily along the branches like Tree Creepers.

The NUTHATCHES (*Sitta*) are recognisable by their very compact body, moderate beak and tail, long wings, and powerful feet. The strong, hard beak is straight above, but bulges outwards below, and is very sharply pointed at its extremity; the nostrils are round, situated beneath the brow, and covered with short hairs. The tarsi are short and the toes long, the inner and centre toes being only slightly connected, while the exterior and centre toes are united as far as the first joint; the large pointed nails are much hooked; the broad, blunt wing, in which the third and fourth quills exceed the rest in length, is soft and flexible; the short, broad tail is formed of twelve weak feathers, so pliable in texture as to render that member quite useless for climbing. The sexes are almost alike in colour, the plumage of both being usually of a blueish grey above and brownish red beneath; the young

closely resemble their parents. Almost every part of the world, if we except Central and Southern Africa and South America, affords a home to some members of this family; and everywhere forests and woodland districts are their principal resort, but they are also occasionally found in rocky localities. So extraordinary are the climbing powers of these birds that they not only exhibit unrivalled agility when disporting themselves in their favourite trees, but are actually capable of descending a perpendicular wall or mass of rock; a feat, we believe, never attempted by any other members of the feathered creation. All the various groups remain throughout the entire year in their native lands, and merely wander to a short distance from their birthplace after the breeding season. Insects and seeds of various kinds afford them means of subsistence. The nest is placed in a hole of a tree, or a



THE COMMON NUTHATCH (*Sitta caesia*).

fissure in a rock or wall, the entrance being carefully covered with clay or similar material. The eggs, from six to nine in number, have a light shell, spotted with red.

THE COMMON NUTHATCH.

The COMMON NUTHATCH (*Sitta caesia*) is deep grey on the mantle, and reddish yellow on the under side; a black stripe passes across the eyes to the nape; the chin and throat are white, the sides and lower tail-coverts reddish brown, and the quills blackish grey, with light borders (those at the exterior are white at the root); the centre tail-feathers are blueish grey, the rest deep black, marked with blueish grey at the tip; those at the exterior are also decorated with white spots. The eye is brown, the beak light grey above and deep grey on its lower portion, and the foot greyish yellow. This species is six inches long, and ten broad; the wing measures three inches and a quarter, and the tail one inch and two-thirds. The female is distinguished from her mate by her inferior size, the comparative paleness of her under side, and the narrowness of the black line across the eyes.

The *Sitta Europæa* is a very similar species, also inhabiting Europe. These birds are met with in all parts of our continent, from Jutland to the most southern latitudes, and are usually to be seen in pairs or small parties. Although they by no means avoid the society of man, they principally frequent woods and forests, but leave these retreats during the autumn, to wander for a time over the surrounding country. Insects, spiders, seeds, and berries constitute the principal food of the Nuthatches, and they also occasionally swallow gravel or small stones, in order to assist digestion.

The eggs, from six to nine in number, are laid about May ; these are white, marked and spotted with deep red. The female alone broods, and the eggs are hatched within a fortnight. Both parents assist in the labour of instructing and tending the little family, and rear them principally upon caterpillars. The young remain in the nest until fully fledged, and do not begin life on their own account until after the moulting season.

THE SYRIAN NUTHATCH.

The SYRIAN NUTHATCH (*Sitta Syriaca*) is somewhat larger than the species above described, from which it also differs in its mode of life and habits. The upper parts of the body are greyish blue, and the under side partially of a yellowish shade ; the throat, a large portion of the breast, and the centre of the belly are white ; the tail is grey, spotted with yellowish brown on the inner web of the exterior feathers.

This species, which is somewhat larger than the bird last described, is commonly met with in Greece, and is also found in Syria, and on the lofty mountains between Bosnia and Dalmatia. Everywhere it exclusively frequents rocky heights, ascending and descending the most precipitous declivities with the utmost facility. It never enters forests, but occasionally seeks shelter in detached clumps of trees. Insects, seeds, and berries afford it the means of existence, and when in quest of these it displays activity and cleverness fully equalling its congeners.

The strange, penetrating cry of the Syrian Nuthatch closely resembles a burst of shrill laughter. Muhle tells us that the nest is constructed in a nook in some rock, so situated that it is warmed by the rays of the sun, either in the morning or at noon. The nest itself is about eleven inches long, and carefully formed of clay ; the entrance passage sometimes terminates in a cavity, warmly lined with different kinds of hair. The exterior wall, according to Muhle, is frequently decorated with the wings of some species of beetles. The eggs, usually eight or nine in number, have a white shell, spotted with red, and are laid about May. The female is so devoted to her young that she may be taken by hand while engaged in the duty of incubation.

The CREEPERS (*Sittella*) inhabit New Holland, and are distinguishable from the members of the group above described by their awl-shaped beak, which is much compressed at its sides, and notched at the extremity of the upper mandible. The second and third quills in the wing are the longest, and extend as far as the end of the short even tail. As regards their general habits, these birds closely resemble the other members of their family ; the nests, however, are entirely different, both as to position and structure.

THE BONNETED CREEPER.

The BONNETED CREEPER (*Sittella pileata*), a species inhabiting South-western Australia, is black on the top of the head, greyish brown on the nape and back, and blackish brown on the wings ; the brow, a stripe over the eyes, the throat, breast, and centre of the belly are all white, the two latter shaded with greyish brown toward the side ; the quills are blackish brown, with a reddish brown patch in their centre, and a greyish brown tip. The eye is yellowish brown, the beak yellow at its base and

black at its tip; the foot is yellow. The length of this bird is four inches and three-quarters, the wing measures three inches and a half, and the tail one inch and a half.

Gould tells us that these Creepers exhibit great facility in climbing and descending the branches of trees, and are usually seen frequenting their favourite haunts in small parties. Although endowed with very considerable powers of flight, they rarely employ their wings, except when desirous of attaining a neighbouring tree. Their cry is a short, weak, piping note. The small nest, which is usually placed upright on the foot of a branch, is smoothly and artistically formed of strips of bark, fastened together by spiders' webs. Incubation commences in September. The eggs, three in number, are white, marked with circular green spots.

The WALL CREEPERS (*Tichodroma*) are recognisable by their compact body, short neck, large head, and very long, thin, and almost rounded beak, which is slightly curved and pointed at its tip. The feet are strong, the toes slender, and armed with large hooked and pointed claws. The first quill of the small, rounded wing is very short, and the fourth or fifth longer than the rest; the short tail is formed of soft, broad feathers, rounded at their tips. The lax, silky plumage is usually bright in hue, but varies in its coloration at different seasons. The tongue, which resembles that of the Woodpecker, is three-quarters of an inch long, sharp at its extremity, and furnished with numerous bristle-like hooks.

THE ALPINE OR RED-WINGED WALL CREEPER.

The ALPINE OR RED-WINGED WALL CREEPER (*Tichodroma muraria*) is principally of an ash-grey tint; the region of the throat is black in winter and white in summer; the wings and tail are mostly black; but all the quills of the former, from the third to the fifteenth, are of a bright red towards the base, as are the smaller shoulder-feathers, and a narrow border on the outer web of the large wing-covers. The quills are decorated with white or yellow spots on the inner web, and the tail-feathers are bordered with white; the eye is brown; the beak and foot are black. This species is six inches and one-third long, and ten inches and a half broad; the wing measures three inches and a half, the tail two inches and a quarter; the beak is from eighteen to twenty lines long.

This interesting bird is very commonly met with upon the Alps, Pyrenees, Apennines, Balkan, Carpathian, and other mountains. Rüppell saw it on the Altai and Abyssinian ranges. Jerdon tells us that it is common on the Himalayas, and is also found in Cashmere and Afghanistan.

"This bird," writes Jerdon, "is found throughout the Himalayas, from whence it descends in winter to the Alpine parts of the Punjab. It is also found in Cashmere, Afghanistan, and the southern parts of Europe. I saw it frequently near Darjeeling, but only in the winter, at a height of from 2,500 to 5,000 feet or so. I first met with it in a tea plantation at Kursim, hunting along some small, bare ravines that the heat of the sun had made in the ground, and occasionally on the bank of a road. I have also seen it on a rock by the wayside, and on perpendicular cliffs along some of the rivers. It looks very beautiful when flitting about, the fine red on its wings fully displayed; and, indeed, has the appearance rather of a butterfly than a bird. Such specimens as I have examined had eaten spiders and coleoptera." This species has no call-note. In Europe it descends from the Alps, and is found on walls of old buildings, whence the name given by Linnæus. It is stated to breed in clefts and holes of rocks, and in old buildings. The eggs, we are told, are of a fine bright red.

The smallest of the Climbing Birds may be conveniently divided into two groups, the TREE CREEPERS and TREE PECKERS.

The TRUE TREE CREEPERS (*Certhia*) are very small and slender, with delicate, sharply-

pointed beaks, more or less curved, weak feet, and long toes, armed with large, hooked, and sharp claws. The wings, of which the third or fourth quills exceed the rest in length, are blunt, and formed of weak feathers; the long, narrow, conical tail is divided into two points at its tip, and formed of strong feathers; the lax, soft plumage is of a brownish hue above, and white beneath; the horny tongue has a sharp margin, the tip is thread-like, and the base is furnished with tooth-like appendages. These birds principally inhabit the Eastern Hemisphere and North America.



THE ALPINE WALL CREEPER (*Tichodroma muraria*).

The TREE PECKERS are more powerfully formed than the above-mentioned birds. Their beak is comparatively long, more or less curved, and very sharply pointed at its tip; the feet are short, the toes long, armed with high, sharp, and much-curved claws; the wing, in which the third or fourth quill is the longest, is pointed; the long, stiff tail usually terminates in two points; the plumage is of a uniform tint on the back, but variegated on the under side; the tongue is horny at its tip.

The above groups resemble each other so closely in their habits that one description will suffice for them both; and, to avoid confusion, we shall combine them under the general name of—

TREE CLIMBERS (*Scandentes*). The Tree Climbers pass their time within the shelter of their native woods, keeping together in pairs or families; some species, however, associate with other birds,

and in their company make short excursions within the boundaries of their forest home. Insects, eggs, larvæ, spiders, and similar fare constitute their principal means of support. In search of these the larger species bore the bark of trees after the manner of the Woodpecker, while the weaker members of the group obtain a meal by exploring holes and crannies in the trunks and branches by the aid of their sharp beaks. The voices of all are insignificant, and their habits generally quiet and unsocial. Almost all build a large nest within the shelter of a tree-hole.

THE COMMON TREE CREEPER.

The COMMON TREE CREEPER (*Certhia familiaris*) is of a deep grey, spotted with white, the under side being entirely of pure white; the bridles and rump are brownish grey, the latter shaded



THE COMMON TREE CREEPER (*Certhia familiaris*).

with yellowish red; a white stripe passes over the eyes. The quills are deep brownish grey, and all except the first are tipped with white, and have a whitish yellow line across the centre; the tail-feathers are brownish grey, those at the exterior edged with light yellow. The eye is dark brown, the upper mandible black, and the lower portion of the beak reddish grey, as is the foot. The length of this species is five, and its breadth seven inches; the wing measures two inches and one-third, and the tail two inches and one-sixth.

The Common Tree Creeper is an inhabitant of the woodland districts and orchards of Europe and Siberia, and is frequently found at a considerable elevation on such mountains as are not entirely destitute of trees. Like other members of its family, it remains within a certain limited tract during the breeding season, and after that period wanders over the surrounding country in company with Titmice, Woodpeckers, and other birds. Its flight is rapid, but unsteady; and during the greater part of the year it is restricted to the slight effort required to pass from one tree to another. Upon the ground its movements are extremely awkward; it is only among the branches that it displays the

wonderful activity of which it is capable. Its cry closely resembles that of the Golden-crested Wren. Towards man it exhibits the utmost friendliness, and frequently ventures close to his dwellings, or even occasionally makes its nest within some tempting hole in an old house or wall.

During the summer the temperament of the Tree Creeper is joyous and brisk, but wintry weather soon renders it dull and uneasy. No doubt this very visible discomfort arises in some measure from the impossibility of keeping its feathers in the neat, trim state in which it delights at other seasons of the year.

Holes and fissures are usually employed by this species, both for building purposes and as sleeping places. The nest, which varies considerably in size, is formed of dry twigs, grass, leaves, straw, or bark, woven together with spiders' webs, and lined with feathers and fibres of various kinds. The chamber of the young is round and deep, and so compactly and neatly finished off as to render it a real work of art. The brood consists of eight or nine white eggs, spotted with red, and deceptively like those of the Titmouse. Both parents assist in the labour of incubation, and feed their hungry family with great devotion. The young usually remain for a long time in the nest, but if alarmed will scramble out, and hurry along the branches to some safe retreat, even before they are fully fledged. The female lays twice during the summer, the first time about April, and again in June. The second brood rarely consists of more than from three to five eggs.

THE SABRE-BILL.

The SABRE-BILL (*Xiphorhynchus trochilirostris*) is readily known by its unusually long, slender, sickle-shaped beak, and short tail. The wings, in which the fourth quill is the longest, are also comparatively short, and the legs are slender. The tongue is short, and broad at its tip. The plumage is of a dull olive-brown, streaked with yellowish white on the head, throat, and breast; the wings and tail are deep reddish brown; the eye is brown, the beak reddish brown, and the foot of a dull brownish hue. This species is nine inches and a half long, and eleven and a quarter broad; the wing measures three inches and three-quarters, the tail three inches and a quarter, and the beak two inches and one-third.

"I found this strange bird," says the Prince von Wied, "in the vast, unbroken forests that extend from Ilheos to Bahia, where it lives in pairs upon the trees from which it gathers the insects and beetles upon which it subsists."

THE WOODPECKER TREE-CHOPPER.

The WOODPECKER TREE-CHOPPER (*Dendroplex picus*) is recognisable by its straight, pointed beak, which is much compressed at its sides, and furnished with a high sharp ridge at its culmen. The wing is comparatively short, the tail long, and the foot large. The plumage is entirely of a reddish brown, the feathers on the head, throat, and breast being enlivened by broad white patches, surrounded by a greyish brown margin. This bird is eight inches long; the wing measures four and the tail three inches.

The *Dendroplex picus* is found over almost the whole of South America, and everywhere frequents the primitive forests, obtaining its food from the bark of trees, after the manner of the True Woodpeckers. At the conclusion of the breeding season it quits its native fastnesses with its companions, and ventures freely down, even near the abode of man. The voice is clear, but confined to one note. The eggs are laid in the holes of trees.

The WOODPECKERS (*Picida*), the last group of the tree-climbing races, possess a slender body and powerful beak, which is usually straight, conical, and furnished with a sharp ridge at its

culmen. The short, strong feet turn inwards ; the toes are long, and placed in pairs, the exterior pair being connected as far as the first joint ; the hinder toe, which is the smallest of all, is so situated as to pair with the innermost and longest toe ; in some instances this short fourth toe is but slightly developed, or entirely wanting ; the claws are long, strong, very sharp, and much hooked. The wings are rounded, and of medium size ; their ten primaries are narrow and pointed, whilst the secondaries (from nine to ten in number) are broader, but not much shorter, than the primary quills. Of these latter, the first is very small, those next in order graduated to the third or fourth, which is the longest. The very remarkable tail is formed of ten large and two small feathers. These latter are placed above instead of under the rest ; the centre tail-feathers are the largest, and very stiff. The strangely constructed tongue, by the aid of which the Woodpeckers are enabled to capture the small insects upon which they in a great measure subsist, is sharp, barbed, pointed, and endued with a glutinous secretion, derived from glands situated in the throat, and communicating with the mouth by two long ducts, the glutinous coating being thus renewed every time the tongue is drawn within the bill. The plumage of these birds is thick ; the feathers on the head (which in some species form a crest) are small and slender, whilst those on the hinder parts of the body are short and broad. The Woodpeckers inhabit the woods and forests of both hemispheres, and are especially numerous in warm latitudes. Fruits, seeds, and insects constitute their food, and in pursuit of the latter they exhibit wonderful dexterity—climbing with astonishing activity upon the trunks and branches of trees ; and when, by tapping with their bills, a rotten place has been discovered, they dig at once vigorously in search of the grub or larvæ snugly embedded beneath the bark—thus rendering inestimable service to man, by destroying hosts of insects.

The Woodpeckers both roost and breed in hollow trunks, or holes in trees, enlarged to the requisite size by the aid of their strong, sharp mandibles. The eggs, which are smooth, glossy, and white, vary considerably in number ; they are deposited upon a bed of chips, or *débris*, placed at the bottom of the hole selected for their reception.

The BLACK WOODPECKERS (*Dryocopus*) comprise the largest and most powerful of the race, and are at once recognisable by the crest that adorns their head, and the prevalence of black in the coloration of their plumage. America must be regarded as the central home of these birds, as there several kinds inhabit every latitude ; whilst, in the Eastern Hemisphere, but one species is met with in Europe, and few are found even in India.

THE EUROPEAN BLACK WOODPECKER.

The EUROPEAN BLACK WOODPECKER (*Dryocopus martius*) has the plumage of a uniform black, with the exception of the top of the head, which is of a bright crimson ; in the female the bright feathers are limited to a small patch at the back of the head. The eye of both sexes is pale yellow, the beak pearl-grey, tipped with blueish grey, and the foot lead-colour. The young closely resemble the adult birds. This species is from seventeen to eighteen inches long, and twenty-eight to twenty-nine broad. The wing, in which the fifth quill is the longest, covers two-thirds of the tail, which measures from six inches to six inches and a half ; the tarsus is almost entirely covered with feathers, and exceeds the centre toe and claw in length. The strong beak is broader than it is high, and straight at its culmen.

Although all the wooded tracts of Europe, from sixty-eight degrees north latitude as far as Greece and Spain, are inhabited by the Black Woodpecker, it is seldom met with in England, and is but rarely seen in Holland. It also frequents Asia, as far as the northern side of the Himalayas. Everywhere fir and pine forests are its favourite resorts, even when these extend over mountain

ranges ; indeed, it rarely visits tracts covered with any other description of trees, except during its wanderings from one place to another. Like all other European Woodpeckers, this species does not migrate, and but rarely travels to any great distance from its native haunts.

The Black Woodpecker is shy and retiring in its habits, and, if approached, studiously conceals itself from observation by creeping round the tree or branch on which it happens to be at work. Its food is obtained by perforating the bark or searching the fissures of trees, a process which it performs with great dexterity, the tail being habitually employed as a means of support whilst climbing. The



THE WOODPECKER TREE-CHOPPER (*Dendroplex picus*).

night is passed in holes in the trunk of some old tree ; and in a cavity of this description the glossy white eggs are also deposited. We learn from Temminck that the Black Woodpecker lays three eggs ; and that when other food is scarce it will eat seeds or berries. Its voice somewhat resembles a harsh, loud laugh.

The GIANT WOODPECKERS (*Campephilus*), a group comprising the largest members of the family, inhabit America. These birds are characterised by their powerful body, large head, and long, thin neck. Their beak is long, straight, and strongly formed ; their feet muscular, and the tarsi unfeathered. Of the toes, the outermost of the hinder pair exceeds the rest in length. The wings and tail are long, the third and fourth quills of the former being the longest. The plumage is black,



THE EUROPEAN BLACK WOODPECKER (*Dryocopus martius*)

marked with white. The feathers on the head form a crest, which in the male is of considerable size, and of a red colour.

Two species of Giant Woodpeckers are worthy of special notice, named respectively the IMPERIAL and the IVORY-BILLED WOODPECKERS.

THE IMPERIAL WOODPECKER.

The IMPERIAL WOODPECKER (*Campephilus imperialis*) is almost entirely black. A stripe on the shoulders, the tip of the hinder quill, and the lower wing-covers are white, the latter spotted with black on the exterior edge; the crest of the male is scarlet, and that of the female black. This species is above twenty-five inches long; the wing measures twelve and the tail nine inches.

THE IVORY-BILLED WOODPECKER.

The IVORY-BILLED WOODPECKER (*Campephilus principalis*) is also black; and the centre as well as the hinder quills are white; the lower wing-covers are striped with black; and the white lines on the shoulder extend to the sides of the head. The eye is bright yellow, the beak as white as ivory, and the foot greyish blue. This bird is twenty-one inches long, and thirty broad; the wing measures ten inches and a half, and the tail seven inches and a quarter.

The Imperial Woodpecker inhabits the mountain tracts of California, as far as the boundaries of Mexico, whilst the Ivory-beak frequents the forests that extend along the Mississippi to the Ohio. We are but little acquainted with the habits of the first-mentioned bird, but are indebted to Audubon for a most graphic description of the life and habits of the Ivory-beak.

“The Ivory-billed Woodpecker,” says that writer, “confines its rambles to a comparatively small portion of the United States. Descending to the Ohio, we met with this splendid bird for the first time near the confluence of that river and the Mississippi; after which, following the windings of the latter, either towards the sea or in the direction of the Missouri, we frequently observe it. On the Atlantic coast, North Carolina may be taken as the limit of its distribution, though individuals are occasionally seen in Maryland. To the west of the Mississippi it is found in all the dense forests bordering the streams which empty their waters into that majestic river, from the very declivities of the Rocky Mountains. The lower part of the Carolinas, Georgia, Alabama, Louisiana, and Mississippi are, however, the favourite resorts of this bird; and in these States it constantly resides, breeds, and passes a life of peaceful enjoyment, finding a profusion of food in all the deep, dark, and gloomy swamps dispersed over them. I wish, kind reader, that it were in my power to present to your mind’s eye the favourite resort of the Ivory-billed Woodpecker. Would that I could describe the extent of those deep morasses, overshadowed by millions of gigantic dark cypresses, spreading their sturdy moss-covered branches as if to admonish intruding man to pause and reflect on the many difficulties he must encounter should he persist in venturing farther into their almost inaccessible recesses, extending for miles before him, where he would be interrupted by huge projecting branches, here and there the massive trunk of a fallen and decayed tree, and thousands of creeping and twining plants of numberless species! Would that I could represent to you the dangerous nature of the ground, its oozing, spongy, miry condition, although covered with a beautiful, but treacherous carpeting, composed of the richest mosses, flags, and water-lilies, no sooner receiving the pressure of the foot than it yields, and endangers the very life of the adventurer; whilst here and there, as he approaches an opening that proves merely a lake of black, muddy water, his ear is assailed by the dismal croaking of innumerable frogs, the hissing of serpents, or the bellowing of alligators! Would that I could give you an idea of the sultry, pestiferous atmosphere, that nearly suffocates the intruder during the meridian heat, in those gloomy and horrible swamps!

“The flight of the far-famed Ivory-billed Woodpecker is graceful in the extreme, although seldom prolonged to more than a few hundred yards at a time, unless when it has to cross a large river, which it does in deep undulations, opening its wings at first to their full extent, and nearly closing them to renew the propelling impulse. The transit from one tree to another, even should the distance be as much as a hundred yards, is performed by a single sweep; the bird appears as if merely swinging itself from the top of the one tree to that of the other, forming an elegantly-curved line. At this moment all the beauty of the plumage is exhibited, and strikes the beholder with pleasure. It never utters any sound whilst on the wing, except during the love season; but at all other times no sooner has this bird alighted than its remarkable voice is heard at almost every leap that it makes whilst ascending against the upper parts of the trunk of a tree or its highest branches. Its notes are clear, loud, and rather plaintive; they are heard at a considerable distance, perhaps half a mile, and resemble the false, high note of a clarionet. They are repeated three times in succession, and may be represented by the syllables ‘Pait, pait, pait.’ These are heard so frequently that the bird spends few minutes of the day without uttering them; and this leads to its destruction, not because, as some suppose, this species is a destroyer of trees, but because it is a beautiful bird, and the rich scales attached to its upper mandible form an ornament for the war-dress of the Indians, or for the shot-pouch of the hunter or squatter.

“The food of this species consists principally of beetles, larvæ, and large grubs; no sooner, however, are the grapes of our forests ripe than they are eaten by the Ivory-billed Woodpecker with great avidity. This bird seldom comes near the ground, but prefers the tops of the tallest trees. Should it, however, discover the half-standing, broken shaft of a large, dead tree, it attacks it in such a manner as nearly to demolish it in the course of a few days. I have seen the remains of some of these ancient monarchs of our forest thus excavated, and that so singularly that the tottering fragments of the trunk appeared to be merely supported by the great pile of chips by which its base was surrounded. The strength of this Woodpecker is such that I have seen it detach pieces of bark seven or eight inches in length at a single blow of its powerful beak; and by beginning at the top branch of a dead tree tear off the bark to an extent of twenty or thirty feet in the course of a few hours, leaping downwards with its body in an upright position, tossing its head to the right and left, or leaning it against the bark to ascertain the precise spot where the grubs were concealed, and immediately after renewing its blows with great vigour, all the while sounding its loud notes, as if highly delighted. This species generally moves in pairs. The female is always the most clamorous and the least shy. Their mutual attachment is, I believe, continued through life. Except when digging a hole for the reception of their eggs, these birds seldom, if ever, attack living trees for any other purpose than that of procuring food, in doing which they destroy insects that would otherwise prove injurious to the trees. I have frequently observed the male and female retiring to rest for the night into the same hole in which, long before, they had reared their young.

“The Ivory-billed Woodpecker nestles earlier than any other species of its tribe. I have observed it boring for that purpose in the beginning of March. The hole, I believe, is always made in the trunk of a live tree, and at a great height. The birds pay great attention to the situation of the tree and the inclination of its trunk, because they prefer retirement, and because they are anxious to secure the aperture against the entrance of water during beating rains; to prevent such a calamity, the hole is generally dug immediately under the junction of a large branch with the trunk. It is first bored horizontally for a few inches, and then directly downwards. The average diameter of the different nests I have examined was about seven inches within, although the entrance, which is perfectly round, is only just large enough to admit the bird. Both birds work most assiduously at this excavation, one waiting outside to encourage the other whilst it is engaged in digging, and when the

latter is engaged, taking its place. For the first brood there are generally six eggs. They are deposited on a few chips at the bottom of the hole, and are of a pure white colour. The second brood makes its appearance about the tenth of August."

"The first place I observed the bird at," says Wilson, "when on my way to the South, was about twelve miles north of Wilmington, in North Carolina. Having wounded it slightly in the wing,



IVORY-BILLED WOODPECKER (*Campephilus principalis*).

on being caught it uttered a loudly-reiterated and most piteous note, exactly resembling the violent crying of a young child, which terrified my horse so much as nearly to have cost me my life. It was distressing to hear it. I carried it with me under cover to Wilmington. In passing through the street its cry surprised every one within hearing, particularly the females, who hurried to the doors and windows with looks of alarm. I drove on, and on arriving at the piazza of the hotel where I intended to put up, the landlord came forward and a number of other persons, all equally alarmed at what they heard. This alarm was greatly increased by my asking whether they could find accommodation for



Plate 22, Cassell's Book of Birds

PTILOGONYS ARMILLATUS

WHISKERED FANTAIL.

(Life size)



myself and my baby ; the man looked blank and foolish, while the others stared with still greater astonishment. After diverting myself for a minute or two at their expense, I drew my Woodpecker from under the cover, and a general laugh took place. I took him upstairs, and locked him in my room while I went to look after my horse. In less than an hour I returned, and on opening the door he set up the same distressing shout, which now appeared to proceed from grief that he had been discovered in his efforts at escape. He had mounted along the side of the window, nearly as high as the ceiling, a little below which he had begun to break through. The bed was covered with large pieces of plaster. The latter was exposed for at least fifteen inches square, and a hole opened large enough to admit the fist close to the weather-boards ; so that in less than another hour he would



THE RED-HEADED BLACK WOODPECKER (*Melanerpes erythrocephalus*).

certainly have made his way through. I now tied a string to his leg, fastened him to the table, and again left him. As I re-ascended the stairs I heard him again hard at work, and on entering had the mortification to find that he had almost ruined the mahogany table, on which he seemed to have wreaked his whole vengeance. While engaged in taking a drawing of him, he cut me severely in several places, and, on the whole, displayed such an unconquerable spirit that I was frequently tempted to restore him to his native woods. He lived with me nearly three days, but refused all sustenance, and I witnessed his death with regret."

The head and bill of this species are held in great esteem, as a sort of charm or amulet, by many tribes of the American Indians, who ornament their belts with them ; and Europeans eagerly purchase them as curiosities. When wounded, this Woodpecker generally ascends the nearest tree in a spiral direction, till it attains the topmost branches, where it hides ; but if intercepted and laid hold of, it defends itself desperately, both with its beak and claws, inflicting severe lacerations.

The BLACK WOODPECKERS (*Melanerpes*) are less remarkable for their size than for the beauty of their plumage. In these birds the body is powerful, the head large, and the neck short. The beak is straight, broader than it is high at the base, its upper mandible is arched, and its margins turned inwards; the distinguishing characteristics of the bill, however, are the four small parallel ridges that commence at the nostrils, and extend as far as the centre of the beak. The tarsus equals the reversible toe and its claw in length; the fourth and fifth wing-quills are of equal size, and longer than the rest; the tail is much rounded; and a small space around the eyes is quite bare. Black, red, and white predominate in the coloration of the plumage. All the various members of this group inhabit North and South America.

THE RED-HEADED BLACK WOODPECKER.

The RED-HEADED BLACK WOODPECKER (*Melanerpes erythrocephalus*) is of a bright red colour on the head and neck. The mantle, wings, and tail are of a jetty blackness; the hinder quills, rump, and under side pure white. The eye is brown, the beak and feet blueish black. The female is smaller and less brightly coloured than her mate. In the young the head, throat, mantle, and breast are of a greyish brown, marked with blackish brown, crescent-shaped spots. The exterior quills are blackish brown, the inner ones reddish white, striped with blackish brown towards the tip; the tail-feathers are deep brownish black. This species is nine inches long and seventeen broad; the wing measures four inches and five-sixths, and the tail two inches and three-quarters.

“The Red-heads,” says Audubon, “may be considered as residents of the Northern States, inasmuch as many of them remain in the southern districts during the whole winter, and breed there in summer; the greater number, however, pass to countries farther south. Their migration takes place at night, is commenced in the middle of September, and is continued for a month or six weeks. They then fly high above the trees, far apart, like a disbanded army, propelling themselves by reiterated flaps of the wing at the end of each successive curve which they describe in their flight. The note which they emit at this time is different from the usual one—sharp and easily heard from the ground, although the birds may be out of sight; this note is continued as if it were necessary for keeping the straggling party in good humour. At dawn of day the whole alight on the tops of the dead trees about the plantations, and remain in search of food until the approach of sunset, when they again, one after the other, mount the air and continue their journey.

“With the exception of the Mocking Bird, I know no species so gay and frolicsome; indeed, their whole life is one of pleasure. They find a superabundance of food everywhere, as well as the best facilities for raising their broods. They do not seem to be much afraid of man, although they have scarcely a more dangerous enemy. When alighted on a fence-stake by the road or in a field, and one approaches them, they gradually move sidewise out of sight, peeping now and then to discover your intention; and when you are just close and opposite, lie still until you are past, when they hop to the top of the stake and rattle upon it with their bill, as if to congratulate themselves upon the success of their cunning. Should you approach within arm's length, the Woodpecker flies to the next stake from you, bends to peep and rattle again, as if to provoke you to a continuance of what seems to him excellent sport. No sooner are the cherries ripe than these birds attack them; and I may safely say that a hundred have been shot on one tree during a single day. Pears, peaches, apples, figs, mulberries, even peas are also thus attacked. They have another bad habit—that of sucking the eggs of small birds, and are often successful in entering the pigeon-houses; the corn as it ripens is laid bare by their bill, when they feed on the top parts of the ear. All this while the Red-heads are full of gaiety. No sooner have they satisfied their hunger than small parties of them assemble in the tops and branches of decayed trees, from which they chase different insects, launching after them for eight or ten yards,

at times performing the most singular manœuvres ; and on securing their victim return to the tree, where immediately after a cry of exultation is heard. They chase each other in a very amicable manner, in long beautifully-curved sweeps, during which the remarkable variety of their plumage becomes conspicuous. When passing from one tree to another their flight resembles the motion of a swing. They move upwards, sidewise, or backwards without apparent effort, but seldom with the head downwards. Their manner of curving from one tree to another is frequently performed as if they intended to attack a bird of their own species, and it is amusing to see the activity with which the latter baffles his antagonist, as he scrambles sidewise down the tree with astonishing celerity ; in the same manner in which one of these birds, suspecting a man armed with a gun, will keep winding round the trunk of a tree, until a good opportunity presents itself for sailing off to another. In this manner a man may follow from one tree to another over a whole field without procuring a shot, unless he watches his opportunity, and fires while the bird is on the wing. On the ground this species is by no means awkward, and hops with perfect ease after the beetles it has espied while perching on a tree or fence.

“It is seldom that a nest newly perforated by these birds is found, as they generally resort to those of preceding years. These holes are found often to the number of ten or a dozen in a single decayed trunk. So few green or living trees are perforated for this purpose by this species that I have never myself seen a single instance. In Louisiana and Kentucky the Red-headed Woodpecker rears two broods every year, in the middle districts more generally only one. The female lays from two to six eggs, which are pure white and translucent, sometimes in holes not six feet from the ground, sometimes as high as possible. The young birds have the upper part of the head at first grey ; but towards autumn the red begins to appear. During the first winter the red is richly intermixed with grey, and at the approach of spring scarcely any difference is perceptible between the sexes. The flesh of the Red-head is tough, and smells so strongly of the ants and other insects on which it feeds as to be scarcely eatable. In Kentucky and the Southern States many of these birds are killed in the following manner :—As soon as they have begun to visit an apple or cherry tree a pole is placed along the trunk, passing up among the central branches, and extending six or seven feet beyond the highest twigs. The Red-head alights by preference on the pole, and while its body is close to it a man standing beneath gives the pole a smart blow with the head of an axe, on the opposite side to that on which the Woodpecker is, when, in consequence of the sudden violent vibration produced in the upper part, the bird is thrown off dead.”

“So common are these birds,” says Wilson, “that wherever there is a tree of the wild cherry covered with ripe fruit there you see them busy amongst the branches ; and in passing orchards you may readily know where to find the sweetest apples by observing those trees on or near which a Red-head is skulking ; for so excellent a connoisseur is he in fruit that wherever an apple or pear tree is found broached by him it is sure to be the ripest and best flavoured. When alarmed at his work he secures a fine one by striking his bill deep into it, and bears it off into the woods.

“Notwithstanding the care,” continues the same writer, “which this bird, in common with the rest of the genus, takes to place its young beyond the reach of enemies, within the hollows of trees, there is one deadly enemy against whose depredations neither the height of the tree nor the depth of the cavity is the least security ; this is the black snake (*Coluber constrictor*), who frequently glides up the trunk of the tree, and, like a skulking savage, creeps into the Woodpecker’s peaceful abode, devours the eggs and helpless young, in spite of the cries and flutterings of the parents, and, if the place be large enough, coils himself up in the spot they occupied, where he will often remain for several days. The eager school-boy, often hazarding his neck to reach the Woodpecker’s hole, at the triumphant moment when he thinks the nestlings his own, strips his arm, launching it down the cavity, and grasps what

he imagines to be the callow young, starts with horror at the sight of a hideous shape, and retreats down the tree with terrified precipitation. Several adventures of this kind have come to my knowledge, and one of them was attended with serious consequences—both snake and boy fell to the ground; and a broken thigh and long confinement cured the youngster of his ambition for robbing Woodpeckers' nests."

THE ANT-EATING BLACK WOODPECKER.

The ANT-EATING BLACK WOODPECKER (*Melanerpes formicivorus*) is an inhabitant of California and Mexico. Its body is black; the brow, a spot on the exterior quills, the anterior border of the hinder quills, and the rump are white; the top of the head as far as the nape is light red; the throat and a band upon the breast are black; the region of the throat is relieved by the sulphur-yellow feathers, by which the black portion is surrounded; the back and sides are streaked longitudinally with white; the eye is yellow, the beak and feet are black. This species is nine inches long; the wing measures five inches and a quarter, and the tail two and a quarter.

"The *Melanerpes formicivorus*," Hermann tells us, "is the noisiest and most numerous of all the Woodpeckers inhabiting California. During the summer these birds are constantly to be seen chasing their insect prey about the topmost branches of the trees, and in autumn are equally busy in laying up a store of acorns against the approach of winter. This is accomplished by boring a series of holes in the trunk of a tree, into each of which an acorn is so firmly introduced as to render its extrication a work of difficulty. An oak or pine tree thus pierced often presents the appearance of being studded with a multitude of bronze nails."

The VARIEGATED WOODPECKERS (*Picus*) constitute a group of small or moderate-sized and compactly-built birds. Their straight beak almost equals the head in length, and is as broad as it is high at the base; the toes are short, and in some species but three in number; in the wing the third quill is the longest; and the tail is conical. The plumage is black, marked with white, and enlivened in some parts by an intermixture of red or yellow. The various members of this group inhabit all those parts of the earth frequented by their congeners, with the exception of Central and Southern Africa.

THE GREAT SPOTTED WOODPECKER.

The GREAT SPOTTED WOODPECKER (*Picus major*) is black upon the upper portion of the body, of a dull yellowish grey beneath, and the brow indicated by a yellow line. The cheeks, a line on the sides of the throat, the large spots on the shoulders, and some irregular markings on the wings are all white; the back of the head and lower part of the belly are light red; and a black line passes from the base of the beak to the nape. The female is without the red upon the nape; and in the young the top of the head is bright red. The eye of all is brownish red, the beak light grey, and the foot greenish grey.

These well-known birds inhabit the whole of Europe and Siberia, as far as Kamschatka. Woods, forests, and plantations of all kinds are their principal resorts, and they especially delight in fir or pine trees. In these localities each bird appropriates a certain district as its own particular domain, and within this boundary no intruder is permitted to forage; for no sooner does the vigilant proprietor hear the bony tap that indicates a close inspection of his hunting-ground than he sallies forth and encounters the unwelcome visitor, chasing it from tree to tree, until it is glad to retire in search of more hospitable quarters. Nuts and the seeds from fir and pine cones are largely consumed by these birds, who exhibit the utmost adroitness in extricating the latter from their hard covering.

This species, which is found throughout the British Isles, though less common than the Green

Woodpecker, "is," says Gosse, "much more strictly an arboreal bird than that species. It climbs with great ease and dexterity, traversing the trunks and limbs of trees in all directions—perpendicularly or horizontally—and digging with great diligence and effect into the bark and wood for insects. In Kensington Gardens, London, where this bird is quite common, it usually keeps about the highest branches of lofty trees, and the loud tappings of its carpentry may frequently be heard; though a fair sight of its person is difficult to obtain, as it dodges from side to side of the trunk or branch on which it happens to be with much cunning and adroitness whenever an observer approaches. It does not, however, confine itself entirely to the tall trees, for it occasionally alights on pollards, as well as on the rails and posts of fences, where, in the accumulated moss and lichen, or in the various holes and crevices, it finds a harvest of spiders, ants, caterpillars, and other insects; while in the season it varies its bill of fare by stealing cherries, plums, and other fruit."

Colonel Montague gives the following instance of the devotion of the female of this species for her young:—"It was with difficulty that the bird was made to quit her eggs; for, notwithstanding a chisel and mallet were used to enlarge the hole, she did not attempt to fly out until the hand was introduced, when she quitted the tree at another opening." The eggs, from five to seven in number, are pure glossy white.

THE HARLEQUIN WOODPECKER.

The HARLEQUIN WOODPECKER (*Piculus minor*), as the least of all European Woodpeckers is called, differs from its congeners in the comparative shortness of its slightly conical beak, rounded tail, and the very peculiar coloration of its plumage. In the male the brow is yellowish grey, the crown of the head bright red, the upper part of the back entirely black, and the lower portion white, streaked with black; the whole of the wings are striped black and white, and relieved by a black line that passes along the sides of the neck, which it thus divides from the grey belly, which is longitudinally streaked with black at its sides. The centre tail-feathers are black, and those at the exterior of a whitish hue, striped with black. The female is without the red patch on the head; the young resemble the mother, but are somewhat duller in their hues. In all the eye is yellowish brown or fiery red, the beak lead-grey, with black tip and culmen, and the foot dark grey. This species is six inches long, and from eleven to eleven inches and a half broad; the wing measures two inches and three-quarters, and the tail two inches and a quarter.

The habitat of the Harlequin Woodpecker extends over the whole of Europe and Central Asia, and it is, we believe, occasionally seen in North-western Africa. Like its congeners, it does not migrate, but only quits its native woodlands to wander over the face of the country during the spring and autumn. At other seasons it keeps strictly within the limits of a certain spot selected as a home, and which invariably contains a large hollow tree suitable as a sleeping-place.

"In England," says Mr. Gould, "this small Woodpecker is far more abundant than is generally supposed. We have seldom sought for it in vain wherever large trees, particularly elms, grow in sufficient numbers to invite its abode. Near London it is very common, and may be seen by an attentive observer in many of the parks in the neighbourhood. The Lesser Spotted Woodpecker appears to perform a certain daily round, traversing a given extent of district, and returning to the same spot whence it began its route. In its actions it is very lively and alert. Unlike the Large Woodpecker, it frequents the smaller and more elevated branches, which it traverses with the utmost ease and celerity. Should it perceive itself noticed it becomes shy, and retires behind the branches; if, however, closely engaged in searching for food it sometimes is so absorbed as to allow itself to be closely approached without suspending its operations. When spring commences it becomes clamorous and noisy, its call being an oft-repeated note, so closely resembling that of the Wryneck as to be

scarcely distinguishable from it. At other times of the year it is mute, and its presence is only betrayed by the reiterated tap which it makes against the bark of the tree."

Naumann tells us that as this bird retires to rest later than many of the other feathered inhabitants of its favourite groves or orchards, many and fierce battles ensue before it can obtain possession of the particular hole it desires, as Titmice or Sparrows also prefer a warm, snug nook, and are by no means disposed to resign quietly in favour of the would-be intruder. In these encounters, however, might usually overcomes right, and a series of very pointed arguments, in the shape of repeated taps and pecks from the enemy's strong beak, eventually compel the weaker bird to seek a night's lodging elsewhere.

The movements of the Harlequin Woodpecker are brisk and active, and as regards its climbing powers it fully equals any member of its family already described. Towards men it exhibits the utmost confidence, but lives in a state of almost perpetual warfare with its feathered companions. During the breeding season, which commences in May, the male makes himself very conspicuous by the constant utterance of his shrill monotonous cry and his restless activity in contending with supposed rivals, or in his struggles to keep off the inroads of other males upon his chosen nesting-place. This latter spot is always at a considerable height from the ground, in an old oak or lofty fruit tree, whose decayed trunk can be readily penetrated by the beaks of the building pair. The recess bored for the reception of the young is six inches deep, and is entered by an aperture as perfectly circular in form as if it had been cut with a centre-bit. Many of these holes are frequently commenced and abandoned before the requirements of the fastidious parents are satisfied. The brood consists of from five to seven brilliantly white eggs, occasionally sparsely sprinkled with fine red spots. The young are hatched within a fortnight by the united exertions of both birds, and are nourished and tended for a considerable time after they have left the nest. The food of this species appears to consist exclusively of insects, as even during the winter months we have found nothing else in its stomach. Ants, spiders, beetles, and insects' eggs it consumes in enormous quantities, and renders inestimable service to the gardener by the countless hosts of destroying insects which it gleans from fruit-trees of every description.

Bechstein gives the following account of an attempt to tame the *Picus medius*, a closely-allied species. "I have," he says, "seen one of these Woodpeckers, which was reared by a lady and seemed much attached to her; it had learned to leave its cage and return, knocking hard at the window if shut out. It was very amusing to see it climbing nimbly over its mistress till it had reached her mouth. It then asked her, by light strokes of the wing, for the food she was accustomed to give it; this was generally a little meat. It disappeared one day, without any one knowing what had befallen it."

THE THREE-TOED WOODPECKER.

The THREE-TOED WOODPECKER (*Apternus tridactylus*), as the most striking of all the European members of this family is called, represents a group recognisable by their straight beak, which is broader than it is high, and equals the head in length. All the three toes are shorter than the tarsus; of these the outermost is the smallest, and the two others of equal length. In the wing the fourth quill is the longest. The centre feathers of the conical tail are furnished with very stiff shafts, and sharply pointed at their tip. The upper portions of the body are black, and the under side dirty white; the brow black, spotted white, and the crown of the head pale golden yellow. A white line, more or less marked with black, passes from the eyes to the middle of the back; the bridles and a second line that terminates at the throat are black; as are the markings on the sides of the belly. The quills and exterior tail-feathers are black, striped with white, and the centre tail-feathers entirely black. The eye is pearl-grey or silver-white, the beak light grey, tipped with black, and the foot dark

grey. The female has the crown of the head spotted with white, instead of being yellow as in the male. The length of this species is nine and its breadth fourteen inches; the wing measures four inches and three-quarters, and the tail three inches and three-quarters.

It is at present undecided whether all such of these birds as inhabit Europe are to be regarded as identical; but if it be so the habitat of this species extends over a large portion of both the European and Asiatic continents. In the northern parts of Europe it is met with in the course of its wanderings as far north as sixty degrees north latitude, and is by no means rare; in Scandinavia, Finland, and Russia it is especially numerous, and in the country about the mouth of the Amoor is one of the commonest of birds. North America also possesses a deceptively similar or identical species. Everywhere it frequents well-wooded mountain regions, and closely resembles the Common Variegated Woodpecker in all the various particulars of its habits, movements, and means of subsistence. It is active and restless in its habits, and generally occupies the topmost branches of the trees. Its cry is loud and shrill, somewhat resembling that of some small quadruped when in great pain. Towards noon it is silent, and retires to rest in a quiet spot. Its rapid, gliding, and undulating flight is always accompanied by a succession of loud notes. The nest is usually from twenty to twenty-four inches deep, and is bored in the trunk of a sound tree. One brood of four to six pure white eggs is laid in the season.

The GREEN WOODPECKERS (*Gecinus*) are readily known by the large size of their elongate body, their slightly conical and curved beak, and short powerful foot, furnished with four toes. The wing, in which the fourth and fifth quills are the longest, is rounded at its extremity, the tongue is of unusual length, and the plumage principally green, of a pale shade on the under side, and marked with undulating lines; the head is occasionally adorned with a brightly-coloured crest.

THE GREEN WOODPECKER.

The GREEN WOODPECKER (*Gecinus viridis*) is bright green on the upper portions of the body, and pale greyish green on the under side; the face is black, the top of the head and nape greyish blue, shaded with bright red; the wing is light yellow; a line on the cheeks of the male is red, in the female black. The quills are pale brownish black, spotted with yellowish or brownish white, and the tail-feathers pale greyish green, striped with black. The eye is blueish white, the beak dull grey tipped with black, and the foot greenish grey. The young are greyish green, spotted with white on the mantle, and whitish grey spotted with black on the under side; the eye is dark grey. The length of this bird is twelve and its breadth twenty inches; the wing measures seven and the tail four inches and a half.

The Green Woodpecker frequently seeks its insect food upon the ground. This species is met with over the whole of Europe; but though common in the wooded districts of England and Scotland, it is very rare in Ireland.

“Nature,” says Mudie, in speaking of this species, “has appointed the Woodpeckers conservators of the wood of old trees, furnished them admirably for their office, and so formed their habits that an ancient tree is an Eden for them, fraught with safety, and redolent of fatness and plenty. So exquisitely are they fitted for their office that the several species vary in tint with the general colour of the trees that they select; if they exhibit an alternation of green moss, yellow lichen, and ruby-tinted cups, with here and there a spot of black, then this, the Green Woodpecker, comes in charge; but if they are covered with the black and white lichens of the Alpine forest, we may look for the spotted race upon the bark. When the renovation of the spring begins to be felt through all nature, the Woodpecker creeps from his hole and tries the trunk till he comes to a hollow place, and

upon that he beats the drum in loud and rolling taps, but yet without in the least perforating the tree. The sound swells and sinks, hurries and lingers alternately, so that at a distance it resembles the sound of rustic glee heard through the woodland; if the Woodpecker's mate catches the sound she answers to it, the bargain is concluded, and the business of the season begins; if not, the male glides on to another tree, uttering his short cry, 'Plu-i, plu-i,' and again resumes his serenade. If there happen to be an odd bird in the forest, this call for a mate may occasionally be heard far into the summer. If the tree selected by a pair of Woodpeckers affords no natural hole for the purpose of



THE GREEN WOODPECKER (*Gecinus viridis*).

nidification, they at once set about excavating one with their bills, working so fast that the strokes cannot be counted either by the eye or ear. They know the tree by the sound, and though they will cut through a few layers of perfect wood, they never mine into a tree unless it has begun to decay in the interior. Nature guides them to those trees where their labour is light and they have plenty to eat. In working they proceed as a mason does when he perforates a block of granite with a pointed pick, they thump away with so much rapidity and force that the timber is ground to powder, and they work in a circle no larger than will admit themselves. They generally burrow so deep that no spoiler can reach the eggs in their absence, and further security is afforded by the opening being in some hidden part of the tree. Materials are seldom carried into the nest, the bed for the reception of the little family being formed of the soft powder from the wood. The eggs, from five to seven in number, have a glossy white shell. The young are fledged in June, and creep about their native tree-hole for some time before they are able to fly."

The CUCKOO WOODPECKERS (*Colaptes*) comprise several species at once recognisable by their decidedly curved beaks and variegated plumage.

THE GOLDEN-WINGED WOODPECKER.

The GOLDEN-WINGED WOODPECKER (*Colaptes auratus*) has a long, broad, curved beak, which is



THE GOLDEN-WINGED WOODPECKER (*Colaptes auratus*).

compressed at its tip; the tarsus is considerably longer than the exterior toe, and in the wing the fourth and fifth quills exceed the rest in length. All the shafts of the pinion and tail-feathers are bright yellow or red. Upon the back the plumage is of a dull reddish brown, striped with black; the head and nape are grey, the former adorned with a crescent-shaped scarlet patch; the rump is white; the upper tail-covers are yellowish white, the sides of the head and throat greyish red, and the bridles and a streak upon the lower throat black; the rest of the under side is white, spotted with black. The quills are sulphur-yellow, and the tail-feathers bright yellow, with dark tips. The female is without the black cheek-stripes. The body is twelve inches and a half long and sixteen broad; the wing measures six inches and the tail four inches and a half.

This species, which is common in all parts of the United States, where it is known by the name of the Flicker (that word being supposed to resemble its cry), has been described at great length by Audubon. "The flight of these birds," says that graphic writer, "is strong and prolonged; they propel themselves by numerous beats of the wings, with short intervals of sailing. Their migrations are carried on at night, as is known by their note and the whistling of their wings. When passing from one tree to another on wing, they fly in a straight line until when within a few yards of the spot where they intend to alight, when they suddenly raise themselves a few feet and fasten themselves to the bark by their claws and tail. If they intend to settle on a branch they do not previously rise; and in either case no sooner has the bird alighted than it nods its head and utters its well-known note, 'Flicker.' It usually moves sideways on a small branch, keeping itself erect; and with equal ease it climbs by leaps along the trunks of trees or their branches, descends and moves sideways or spirally, keeping at all times its head upward and its tail pressed against the bark as a support. On the ground it also hops with great ease. Insects, seeds, berries, and fruit of various kinds constitute the principal food of these Woodpeckers. No sooner has spring returned than their voice is heard from the tops of high, decayed trees. Their note at this period is merriment itself, as it simulates a prolonged and jovial laugh, heard at a considerable distance. Several males pursue a female, and, to show the force of their love, bow their heads, spread their tails, and move sidewise, backwards, forwards, performing such antics as might induce any one witnessing them to join his laugh to theirs. The female flies to another tree, where she is closely followed by half a dozen of these gay suitors, when again the same ceremony is gone through. No fighting occurs, no jealousy seems to exist among them until a marked preference is shown for one, when the rest proceed in search of another female. Each pair proceeds to excavate the trunk of a tree and make a hole large enough to contain themselves and their young; they both work with great industry and apparent pleasure. Should the male be employed the female keeps close to him, and seems to congratulate him on every chip he throws in the air. They caress each other on the branches, climb about and around the tree with delight, rattle with their bill against the top of the dead boughs, chase all their cousins, the Red-heads, defy the Purple Grakles to enter their nest, feed plentifully on insects, beetles, and larvæ, cackling at intervals, and ere a week be elapsed the female has laid four or five eggs, with a pure, white, transparent shell."

Their flesh is esteemed good by many sportsmen, and they are now and then exposed for sale in the markets of New York and Philadelphia.

THE RED-SHAFTED OR COPPER WOODPECKER.

The RED-SHAFTED OR COPPER WOODPECKER (*Colaptes Mexicanus*), a very similar species, inhabiting the Southern States of North America, Texas, and Mexico, is of a light reddish brown on the top of the head and brow; the upper part of the back is greyish brown, with undulating black markings, and the lower portion white; the tail-feathers are greyish brown with bright orange shafts; the chin and throat are light reddish grey; the breast and belly somewhat deeper in shade, and spotted with black; the throat is encircled by a red collar, and the upper breast decorated with a black line; the chin is also indicated by a reddish line.

The manners of this species much resemble those of the species last described; it is, however, shyer in its habits, and but rarely comes to the ground. In the breeding season the male birds display considerable animosity towards each other, and constantly utter a note resembling the word "Whitto, whitto, whitto." The nest is made in a tree-trunk, and it is not uncommon to hear the eager active couple hammering and bumping away like carpenters until a late hour in the evening. The eggs have a pure white shell.

THE FIELD WOODPECKER.

The FIELD WOODPECKER (*Geocolaptes campestris*) is an inhabitant of the South American prairies, and represents a group that, unlike those already described, seek their principal food, not upon the trunks of trees, but from the surface of the ground. The Field Woodpecker possesses a slightly-curved bill, of about the same length as the head; its wings are long, pointed, and powerful, their fourth quill longer than the rest; the strong tail is pointed, and the slender foot furnished with very delicate toes. The variegated plumage is not very brightly tinted; the crown of the head and neck are black; the cheeks, throat, and upper breast golden yellow; the back and wings pale yellow, striped with blackish brown; the lower portion of the back, the breast, and belly are whitish yellow, each feather having black markings; the quills are greyish brown, with gold-coloured shafts, the primaries striped with white on the inner web, and the secondaries on both webs. The tail-feathers are blackish brown, those at the exterior streaked with yellow on the outer, and those in the centre on the inner web. The female is somewhat paler in hue than her mate. The eye is bright red, the beak blackish grey, and the foot dull grey.

The SOFT-TAILED WOODPECKERS (*Picumnus*) constitute a group of very small birds, with long, straight, conical beaks, which are pointed at the tip. The shape of the leg and claw resembles that of the True Woodpecker. The short wings, in which the fourth and fifth quills are the longest, are very blunt and rounded; the tail is composed of twelve soft, rounded feathers, the outermost of which are very short; the plumage is soft, and its feathers few and of unusual size. Most of these birds inhabit South America; Africa possesses one and India three species. We are almost entirely without reliable particulars as to their habits.

THE DWARF WOODPECKER.

The DWARF WOODPECKER (*Picumnus minutus*) is greyish brown on the mantle; the under side is white, streaked with black; the crown of the head is black, delicately sprinkled with white; the brow of the male is red, that of the female is of the same colour as the rest of the head; and the blackish brown quills are edged with yellow. The tail-feathers are black; those at the exterior have a broad white stripe on the outer, and those in the centre on the inner web. The eye is greyish brown, the beak lead-colour at its base and blackish at the culmen and tip, the foot is lead-grey. This small bird is only three inches and seven lines long and six inches broad; the wing measures one inch and ten lines, and the tail one inch. The Dwarf Woodpecker is met with in all the wooded tracts of coast from Guiana to Paraguay, and is frequently seen in the immediate vicinity of the houses. In summer it lives in pairs, in winter in small parties, that fly to a considerable distance over the surrounding coast.

The WRY-NECKS (*Yunx*) inhabit the Eastern Hemisphere, and are recognisable by their slender body, long neck, small head, short blunt wing, in which the third quill is the longest, and a broad soft tail of moderate size. The short, straight, conical beak is pointed, and but slightly compressed at its sides; the foot is furnished with four toes placed in pairs; the plumage lax and soft, and the very protrusile tongue of thread-like tenuity.

THE WRY-NECK.

The WRY-NECK (*Yunx torquilla*) is of a light grey on the upper portion of its body, marked and spotted with a deeper shade; the under side is white, sparsely sprinkled with dark triangular spots;

the entire throat is yellow, with undulating markings ; a black line passes from the crown of the head to the lower part of the back, and the mantle is decorated with numerous black and brown spots of various shades ; the quills are striped with reddish and blackish brown ; the tail-feathers are sprinkled with black, and relieved by five narrow, curved stripes ; the eye is yellowish brown ; the beak and legs greenish yellow. In the young the coloration is paler and the markings less delicate than in the adults ; their eye is greyish brown. This species is seven inches long and eleven broad ; the wing measures three inches and one-third, and the tail two inches and a half. The actual habitat of the Wry-neck appears to be the central parts of Europe and Asia. In a northerly direction it is found as



THE WRY-NECK (*Yunx torquilla*).

far as Scandinavia, and during its migrations often wanders as far as Egypt and Eastern Soudan. Jerdon tells us that it is met with throughout all parts of India during the winter.

The Wry-neck, so called from its strange manner of turning its head, so as to give its neck a twisted appearance, is commonly met with in England, but is rare in Scotland, and, according to Yarrell, has not been met with in Ireland. This species usually resorts to woodland districts, fields, and gardens. "When found in its retreat in the hole of a tree," says the last-mentioned writer, "it makes a loud hissing noise, sets up an elongated crest, and writhing its body and head towards each shoulder alternately, with grotesque contortions, becomes an object of terror to a timid intruder ; and the bird, taking advantage of a moment of indecision, darts with the rapidity of lightning from a situation whence escape seemed impossible." Caterpillars and various insects, especially ants, constitute the principal food of these birds. Bechstein states that they will eat elder-berries. The young are easily tamed ; and in France are often taken from one tree to another, with a string fastened round the leg, to search the bark for insects.

Colonel Montague thus describes the manner in which a female of this species that he had tamed took its food :—" A quantity of mould with emmets and their eggs was given to it ; and it was curious to observe the tongue darted forth and retracted with such velocity and such unerring aim that it never returned without an ant or an egg adhering to it, not transfixed by the horny points, but retained by a peculiar tenacious moisture provided for that purpose. While feeding, the body is kept motionless, only the head being turned from side to side ; and the motion of the tongue is so rapid that an ant's egg, which is of a light colour, and therefore more conspicuous than the tongue, has the appearance of moving to the mouth by attraction, as the needle flies to the magnet. The bill is rarely used, except to remove the mould, in order to get more rapidly at the insects where the earth is hollow. The tongue is thrust into all the cavities to rouse the ants, and for this purpose the horny appendage is extremely serviceable as a guide to the tongue."

The following interesting account of an attempt to drive a pair of these birds from the nesting-place they had selected is given by Mr. Salmon, in the *Magazine of Natural History* :—" I wished to obtain the eggs of the Wry-neck to place in my cabinet, and accordingly watched a pair very closely that had resorted to a garden in the village for the purpose of incubation. I soon ascertained that they had selected a hole in a decayed apple-tree for that purpose, the entrance to which was so small as not to admit my hand. The tree being hollow and decayed near the ground, I reached the nest by putting my arm upwards, and I found on withdrawing the nest that the underneath part of it was composed of moss and hair, having every appearance of being the deserted home of a Redstart ; the upper part was made of dry roots. The nest did not contain any eggs, and I returned it by thrusting it up inside the tree. On passing the same way a week afterwards my attention was arrested by observing one of the birds leaving the hole ; upon which I gently withdrew the nest, and was gratified to find it contained five most beautifully glossy eggs, the shells of which were perfectly white, and so transparent that the yolks shone through, giving them a delicate pink hue. I replaced the nest and visited it during the ensuing weeks, when, to my astonishment, I found that the birds had not deserted the hole, but the female had six eggs more, which I obtained by thrusting the nest up the tree. Next week I again visited the spot, and found that they still pertinaciously adhered to their domicile, having further laid four eggs more. I repeated the experiment, but not having an opportunity of revisiting the spot until ten days after, I thought at the time that the nest was abandoned, and was not undeceived till I again withdrew the nest, having taken the precaution of endeavouring to frighten off the old bird should she be within, which I found was the case ; nevertheless she suffered me to pull the nest to the bottom of the tree before she attempted to escape. There were seven eggs slightly sat upon. It seems to me very extraordinary that the female should allow her nest to be disturbed five times, and the eggs (amounting to twenty-two) to be taken away at different periods within the month, before she finally abandoned the spot she had selected."

HUMMING BIRDS.

THE HUMMING BIRDS (*Stridor*), a family of most beautiful and fairy-like beings, inhabiting the Western Hemisphere, comprise some of the smallest members of the feathered creation. In these birds the beak is generally long, slender, straight, or curved, usually round, and sharp at the tip ; the nostrils are basal, and covered with a large scale ; the wings and tail are very variously formed, the latter being always composed of ten feathers ; the very short tarsi are most delicately constructed ; the long slender toes are covered with small scales, and either partially united or completely free from each other ; the sharp-pointed claws frequently exceed the toes in length. The glorious plumage

possessed by the members of this most attractive family has been enthusiastically described by many writers, but never more eloquently than by Buffon. "Of all animated beings," says that naturalist, "the Humming Bird is the most elegant in form and brilliant in colour. The stones and metals polished by art are not comparable to this gem of nature ; she has placed it in the order of birds, but amongst the tiniest of the race—*maxime miranda in minimis*—she has loaded it with all the gifts of which she has only imparted a share to other birds—agility, nimbleness, grace, and rich attire, all belong to this little favourite. The emerald, the ruby, and the topaz glitter in her garb, which is never soiled with the dirt of earth, for, leading an ærial life, it rarely touches the turf even for an instant. Always in the air, flying from flower to flower, it shares their freshness and their splendour, imbibes their nectar, and only inhabits those climes in which they are unceasingly renewed. The Humming Bird seems to follow the sun, to advance, to retire with him, and to fly on the wings of the wind in pursuit of an eternal spring."

"Along the whole line of the Andes, which form as it were the backbone of America," writes Gould, in the valuable introduction to his magnificent work on the "Trochilidæ," "at remarkably short intervals occur species of this family of birds of the greatest possible beauty, which are not only specifically but generically distinct from each other. Abundant as the species may be towards the northern and southern portions of the great chain of mountains, they vastly increase in number as we approach the equator. The equatorial regions teem with species and even genera that are not found elsewhere. Between the snow-line of the summit of the towering volcanoes and their bases many zones of temperature occur, each of which has its own especial animal and vegetable life. The Alpine region has its flora, accompanied by insects especially adapted to such situations ; and attendant on these are peculiar forms of Humming Birds, which never descend to the hot valleys, and scarcely even to the cooler and more temperate parâmos. Many of the higher zones of extinct and existing volcanoes have their own fauna and flora, even in the interior walls of ancient craters, wherever vegetation has gained a footing. Some species of Humming Birds have there, and there only, as yet been discovered. It is the exploration of such situations that has led to the acquisition of so many additional species of this family of birds, which now reach to more than 400. From Santa Fé de Bogota alone many thousands of skins are annually sent to London and Paris. The Indians readily learn the art of preserving them, and as a certain amount of emolument attends the collecting of these objects they often traverse great distances for the purpose of procuring them. Districts stretching more than 100 miles away from Bogota are strictly searched, and hence it is that from these places alone we receive no less than seventy species belonging to this family. In like manner the residents of many parts of Brazil employ their slaves in preparing their skins for the European markets, and many thousands are annually sent from Rio de Janeiro, Bahia, and Pernambuco ; the inmates of convents are also supplied with many of the more richly-coloured species for the manufacture of feather flowers. How numerous then must these birds be in their native wilds ; and how wonderfully must they keep in check the peculiar kind of insect life upon which they feed !"

In disposition the Humming Birds exhibit a fearlessness and courage quite out of proportion to the delicacy of their structure, and we might cite many instances of the fierce encounters in which they sometimes engage ; we must, however, confine ourselves to an extract from Gosse's interesting little book on the birds of Jamaica.

"The pugnacity of the Humming Bird has been often spoken of ; two of the same species can scarcely suck flowers from the same bush without a rencontre. I once witnessed a combat between two which was prosecuted with much pertinacity, and protracted to an unusual length. It was in the month of April at Phoenix Park, near Savannah-la-Mer. In the garden were two trees of the kind called Malay apple, one of which was but a yard or two from my window. The genial influence of

the spring rains had covered them with a profusion of beautiful blossoms, each consisting of a multitude of crimson stamens with very minute petals, like bunches of crimson tassels, but the last buds were only beginning to open. A Humming Bird had every day and all day long been paying his devoirs to these charming blossoms. On the morning to which I allude another appeared, and the manœuvres of these two tiny creatures became very interesting. They chased each other through the labyrinths of twigs and flowers till, an opportunity occurring, one would dart with seeming fury upon the other, and then, with a loud rustling of their wings, they would twirl together round and round until they nearly came to the earth. It was some time before I could see with any distinctness what took place in these tussles; their twistings were so rapid as to baffle all attempts at discrimination. At length an encounter took place pretty close to me, and I perceived that the beak of the one grasped the beak of the other, and, thus fastened, both whirled round in their perpendicular descent, the point of contact being the centre of the gyrations, till, when another second would have brought them to the ground, they separated, and the one chased the other for about a hundred yards and then returned in triumph to the tree, where, perched on a lofty twig, he chirped monotonously and pertinaciously for a time, I could not help thinking, in defiance. In a few minutes the banished one returned, and began chirping no less provokingly, which soon brought on another chase and another tussle. I am persuaded that these were both hostile encounters, for the one seemed evidently afraid of the other, fleeing when he pursued, though his indomitable spirit would prompt the chirp of defiance, and when resting after a battle I noticed that the vanquished one held his beak open as if panting. Sometimes they would suspend hostilities to suck a few blossoms, but mutual proximity was sure to bring them on again with the same result. In their tortuous and rapid evolutions the light from their ruby necks would flash in the sun with gem-like radiance, and as they now and then hovered motionless, the broadly-expanded tail—the outer feathers of which were crimson-purple, but in the sun's rays transmitted orange-coloured light—added much to their beauty. A little Banana Quit (*Certhiola flaveola*), that was peeping among the blossoms in his own quiet way, seemed now and then to look with surprise on the combatants; but when the one had driven the other to a longer distance than usual the victor set upon the unoffending Quit, who soon yielded the point, and retired humbly enough to a neighbouring tree. The war—for it was a thorough campaign, a regular succession of battles—lasted fully an hour, and then I was called away from my post of observation. Both of the Humming Birds appeared to be males.”

According to Gosse, the Vervain Humming Bird is the only species endowed with a song; this bird warbles very weakly but sweetly for ten minutes at a time during the spring months. The other members of this family at most indulge in a sharp shrill chirp, as they flit from one flower to another.

The GIANT GNOMES (*Eustephanus*), the largest members of the family, are not conspicuous for the gaiety of their plumage. The structure of their long beak varies considerably; the foot is of moderate size; the wings either long and slender or broad and short; the tail, which is of medium length, is forked at its extremity.

THE GIANT HUMMING BIRD.

The GIANT HUMMING BIRD (*Patagona gigas*) is pale brown shaded with green on the upper portions of the body; the wings are greyish yellow; the head, upper breast, and back are marked with dark undulating lines; the wings and tail-feathers are dark brown, the latter enlivened by a green gloss. This species is two inches long.

The Giant Humming Bird inhabits the southern parts of Western America, appearing also in the

extreme south. During the course of its migrations it has been met with at an altitude of from 12,000 to 14,000 feet above the level of the sea.

“Like others of its family,” says Darwin, “it moves from place to place with a rapidity which may be compared to that of the syrphus among dipterous insects, or sphinxes among moths; but whilst hovering over a flower it flaps its wings with a very slow and powerful movement, totally different from that vibrating one common to most of the species which produces the humming noise. I never saw any other bird whose force of wing appeared (as in a butterfly) so powerful in proportion



THE GIANT HUMMING BIRD (*Patagona gigas*).

to the weight of its body. When hovering by a flower its tail is constantly expanded and shut, like a fan, the body being kept in a nearly vertical position. This action seems to steady and support the bird between the slow movements of its wings.

“This largest of all Humming Birds,” observes Gould, “is said to be a bold and vigorous flier, to be quick in all its actions, and to pass from flower to flower with the greatest rapidity; notwithstanding the breadth and volume of its wings, which would seem to be far better adapted for lengthened and continuous progress than for poising in the air, which the bird is in the constant habit of doing while visiting, with little choice, the summer flowers of the forest. It is stated that, unlike the other members of the family, it may frequently be seen perched on some small tree or shrub.”

Mr. Cumming states that in Chili the *Patagona gigas* is strictly migratory; it arrives from the

north in August, and after spending three months in that country, during which time it breeds, returns to whence it came. The nest is a somewhat large, cup-shaped structure, composed of mosses, lichens, and similar materials, put together with cobwebs, and placed in the fork of the branch of some tree or shrub, generally on one overhanging a turbulent stream of water. It lays two eggs, which are white, and about three-quarters of an inch from end to end.



THE SWORD-BILL HUMMING BIRD (*Docimastes ensifer*).

THE SWORD-BILL HUMMING BIRD.

The SWORD-BILL HUMMING BIRD (*Docimastes ensifer*) cannot possibly be mistaken for any other species, owing to the extraordinary size of the slightly-curved beak, which fully equals the entire body in length; the wing is short and broad, and the very decidedly forked tail of medium size. The entire mantle is of a beautiful mineral green; the head copper-red; the throat, centre of breast, and under side of a greenish bronze, which shades into light green at the sides. A small

white spot is placed behind the eye ; the wings are purplish brown ; the tail-feathers dark brown, with a metallic green lustre ; the beak is blackish brown, and foot yellowish brown. The male is eight inches and a half long (of this measurement four inches belong to the beak) ; the wing is three inches, and the tail two inches and a half. The female is of paler hue on the beak, and spotted with white and brown on the under side, enlivened by a metallic shimmer on the sides ; her entire length is seven inches and a half, the beak measuring but three inches. This new and remarkable species, we are told by Gould, inhabits the magnificent region of Santa Fé de Bogota, and was also seen in the Caracas and Quito by Mr. Hartwig, the celebrated botanist and traveller, who states that he observed it engaged in procuring insects from the lengthened corollas of flower-bells, for exploring which its elongated beak is admirably fitted ; affording another instance of the wonderful adaptation of structure to a special purpose so frequently observable in every department of Nature's works.

The GNOMES (*Polytmus*) are moderately large and powerfully built birds, with strong, medium-sized, and more or less curved beaks ; the foot is furnished with short toes and long claws ; the wings are slightly curved ; the broad tail, which is scarcely longer than the closed pinion, has its two exterior feathers much shortened. The plumage is not remarkable for its brilliancy, being usually of a greenish or brownish shade above, and brown variously spotted beneath ; the outer tail-feathers have light tips ; the sexes are almost alike in colour.

THE SAW-BILL.

The SAW-BILL (*Grypus nœvius*) is at once recognisable by its straight, powerful beak, which rises high at its base, and is twice the length of the head, and by its broad tail, the two outer feathers of which are short. Upon the back the plumage is of a pale metallic green, glowing with a reddish lustre ; the brow and crown of head are dark brown ; all the feathers on the mantle, except those on the wing-covers, are edged with reddish yellow ; the sides of the neck are yellowish red ; a narrow line that passes along the throat, the breast, belly, and rump are yellowish white, each feather striped with black ; another pale reddish yellow line passes over the eyes ; the quills are black, those at the exterior enlivened by a violet gloss ; the centre tail-feathers are green and the outermost reddish yellow ; the eye is dark brown ; the upper mandible black, and the lower yellowish white ; the foot is flesh-pink. The body is five inches and three-quarters long ; the wing measures three inches, and the tail one inch and a half.

“The *Grypus nœvius*, says M. Deyrolle, “is common in all the provinces of Santa Caterina, in Brazil, but is more frequently met with in woody situations than elsewhere. Its flight is exceedingly noisy, very vigorous, and capable of being sustained for a great length of time, the bird rarely alighting. Its cry is so loud and piercing as to be heard above everything else, while it flutters round the flowers of various species of orchids, from which it obtains its principal nourishment.”

“In all probability,” says Gould, “the serrations with which the cutting edges of both mandibles of this bird are furnished are expressly provided to enable it to capture with facility some peculiar kinds of insect food ; perhaps spiders and small coleoptera. The nest sent to me by Mr. Reeves is precisely similar in size, form, and situation to those constructed by the members of the genus *Phaëtornis*, being of a lengthened, pointed form, composed of fine vegetable fibres and mosses, intermingled with which, especially on the lower part, are portions of dead leaves and pieces of lichen attached to the extremities of the leaves of apparently a species of palm.”

The velocity with which these Humming Birds glance through the air is extraordinary, and so rapid is the vibration of their wings, that their movement eludes the sight ; when hovering before a flower, they seem suspended as if by some magic power.

THE SICKLE-BILLED HUMMING BIRD.

The SICKLE-BILLED HUMMING BIRD (*Eutoxeres aquila*) principally differs from its congeners in the sickle-shaped formation of its powerful beak and its conical tail. In this species the back is of a glossy greyish green; the head and a small crest by which it is adorned are brownish black, these feathers and those upon the rump being edged with brown; the under side is brownish black, marked on the throat with greyish yellow and on the breast with white spots; the quills are purplish brown, the exterior secondaries tipped with white.

“It is evident,” says Gould, “that the bill of this very rare and singular Humming Bird is adapted for some especial purpose, and we may readily infer that it has been expressly formed to enable this species to obtain its food from the deep and remarkably-shaped blossoms of the various orchidaceous and other plants, with curved, tubular flowers, so abundant in the country the bird inhabits, and for exploring which a bill of any other form would be useless.” At present nothing is known of its habits.

The SUN BIRDS (*Phaëtornis*) have a large, long head and slightly-curved beak. Their foot is small and delicate, with partially feathered tarsus and formidable claws; the tail, in which the centre feathers far exceed the rest in length, is long and conical. The plumage is dull, and the sexes alike in colour, the only difference observable being the formation of the tail.

THE CAYENNE HERMIT.

The CAYENNE HERMIT (*Phaëtornis superciliosus*) is about seven inches long; the wing measures two inches and one-third, and the tail two inches and two-thirds. In this species the mantle is of a pure metallic green, and the under side reddish grey; the feathers on the back have reddish yellow borders; a pale reddish yellow line passes above and below the eye; the quills are brown, shaded with violet; the centre tail-feathers, which are twice the length of those at the sides, are of a dull metallic green, shading into black towards the white tip, and edged with reddish yellow; the upper mandible is black, and the lower half of the under one pale yellow; the feet are flesh-pink. The female has quieter plumage and a shorter tail; the latter is but slightly wedge-shaped, and fully two inches less than that of her mate.

“The *Phaëtornis superciliosus*,” says Gould, “is one of the commonest species of the genus, examples having been sent to Europe for at least the last hundred years. Its native countries are Guiana, Cayenne, and Surinam; its range is known to extend towards Brazil, as far as the confluence of the Amazon, but, as I believe, does not advance farther south than Bahia. Open trails covered with shrub or brushwood are the localities it most frequents.”

Wallace gives the following graphic description of the movements of the *Phaëtornis* and some nearly-allied species:—“I have distinctly observed them visit in rapid succession every leaf and flower on a branch, balancing themselves vertically in the air, passing their beak closely over the under surface of each leaf, and thus capturing any small insect that might be upon them. While doing this the two long feathers of their tail have a vibratory motion, serving apparently as a rudder to assist them in performing the delicate operation. I have seen others searching up and down stems and dead sticks in the same manner, every now and then picking off an insect, exactly as a Bush Shrike or Tree Creeper does—with this exception, that the Humming Bird is constantly on the wing. They also capture insects in the true Fissirostral manner, and may often be seen perched on the dead twig of a lofty tree, the same station that is chosen by the Tyrant Flycatchers and Jacamars, and from which, like those birds, they dart off a short distance, and, after a few whirls and balancings, return

to the identical twig they had left. In the evening, after sunset, when the Goatsuckers are beginning their search over the rivers, I have seen Humming Birds come out of the forest and remain a long time on the wing, now stationary, now darting about with the greatest rapidity, imitating in a limited space the varied evolutions of the Goatsuckers, and evidently for the same end and purpose.

The MOUNTAIN NYMPHS (*Oreotrochilus*) are at once recognisable by the very peculiar formation of the wings, in which the shafts of the exterior quills are remarkably broad. The strong,



THE SICKLE-BILLED HUMMING BIRD (*Eutoxeres aquila*).

high beak is of medium size, and the short tail almost straight at its extremity, only the outer feathers being slightly rounded. The magnificently-coloured and glossy plumage is blue or green upon the mantle, and of a lighter shade on the under side; the region of the throat is usually edged with the most glowing tints, and the exterior tail-feathers are often white. The sexes vary considerably in their coloration.

THE CHIMBORAZIAN HILL-STAR.

The CHIMBORAZIAN HILL-STAR (*Oreotrochilus Chimborazo*), one of the most magnificent members of this group, has a powerful body, long, thin, and slightly-curved beak, moderate-sized but strong wings, a broad rounded tail, formed of pointed feathers, and powerful feet, partially covered with down. The sexes differ considerably in appearance. The male is of a resplendent violet on the

head and region of the throat, with greyish olive-brown mantle and white belly, shading to yellowish brown at its sides ; the centre of the throat is decorated with a long triangular patch of glossy green, divided from the light under side by a line of velvety black ; the quills are purplish brown, and the centre tail-feathers dark green, the rest greenish black on the outer and white on the inner web ; the beak and feet are black. The female is olive-green on the back, and olive-brown on the under side, slightly marked with a lighter shade ; the breast is white, each feather spotted with brown at its tip ;



THE CHIMBORAZIAN HILL-STAR (*Oreotrochilus Chimborazo*).

the centre tail-feathers are brilliant dark green, the rest light greenish brown, and white towards the root ; the two exterior feathers have a white spot on the inner web. The body is four inches and three-quarters long ; the tail measures two inches and three-eighths.

“This beautiful species,” says M. Jules Bourcier, “is exclusively confined to the volcanic mountain, Chimborazo. Here, at an altitude where vegetation ceases, and near the eternal snows, it loves to dwell, the height of its range appearing to be governed by that of the chuquiraga, its favourite shrub, the flowers of which afford it an abundance of nectar and insect food. It is solitary in its habits, and so pugnacious that it immediately offers battle to intruders on its haunts. The male perches on the extremity of the most elevated branch, and is rarely found near the female, which, unlike her mate, invariably perches near the ground, a circumstance that, combined with her

sombre colouring, renders her very difficult of detection. Both sexes retain their greyish green garb during the first year of their existence ; the young males may, however, be at all times distinguished by a tolerably well-defined collar of olive-green and brown. The nest is formed of lichens, and is either suspended to or sheltered beneath a ledge of rock. The eggs, two in number, have a white shell.

The SABRE-WINGS (*Campylopterus*) are at once recognisable from the peculiar shape of the wing, which is broad, with the anterior quills strongly curved, their shafts, in adult birds, becoming suddenly dilated. The tail is large and blunt or broadly rounded at the end, and the powerful beak, which is half as long again as the head, but slightly curved, compressed at its sides, and broader than it is high. The legs are delicate, and the claws long.

DE LATTREI'S SABRE-WING.

DE LATTREI'S SABRE-WING (*Campylopterus hemileucurus* or *Campylopterus De Lattrei*) is of a deep blueish black on the head ; the wing-covers, back, and rump are green ; the quills dark purplish brown ; the tail-feathers blueish black, shaded with green ; a small white spot is placed above the dark eye ; the beak is black, the foot dark brown. The head of the female is bronze-colour, the rest of the mantle glossy green, with a golden shade ; the region of the throat and sides of the breast are greenish blue, and the under side grey, with a greenish gloss. This gaily-tinted bird inhabits Mexico and Central America.

"Of all the members of the genus," says Gould, "this species is by far the largest and the most beautifully coloured. It is said to be the boldest of its race, and to be so extremely pugnacious that every bird venturing into the neighbourhood of its territory is furiously attacked and driven away. This peculiar feature in the habits of the race explains the use of the broad and powerful shafts of the primaries, which form so conspicuous a character in the males of the *Campylopterus*. This bird is strictly a Mexican or Central American species. M. de Lattrei, to whom we are indebted for its discovery, states that it is found in the forests of Jalapa during two months of the year only, that it is known by the name of the 'Luce-fleur-royal,' and that it feeds during the entire day, instead of during any particular hours. He adds that it selects a flowering shrub, which it never quits, and from which it chases with anger all the species of the family that may seem desirous of approaching it. On taking flight it utters a cry."

"The large showy tail of this Humming Bird," says Mr. Salvin, "makes it one of the most conspicuous when on the wing. The females are especially abundant, their ratio to the males being as five to two."

"This beautiful bird," says M. Montes de Oca, "which is generally known in Mexico by the name of the Royal Blue Myrtle-sucker, arrives in the vicinity of Jalapa, Coatepec, and Orizaba in considerable numbers during the months of October and November, and is mostly found feeding from a plant called marapan between the hours of seven and one o'clock. During this time it is seldom seen to alight, and then only for a very short time, but is constantly on the wing, flitting from flower to flower, describing segments of a circle in its flight, and sometimes almost touching the ground. For the remainder of the day very few are to be seen, and I think it probable that they visit the woods for certain kinds of mosquitoes, with which I have often found their stomachs well filled. The pugnacity of this species is very remarkable ; it is very seldom that two males meet without an aërial battle. The contest commences with a sharp, choleric shriek, after which, with dilated throats, the feathers of the whole of their bodies erected on end, and their tails outspread, they begin to fight with their bills and wings ; the least powerful soon falls to the ground or flies away.

I have never known one of these battles last longer than about ten seconds, and in the specimens I have under my notice in cages, their fighting has mostly ended in the splitting of the tongue of one of the two, which then surely dies, from being unable to feed."

The TRUE SABRE-WINGS (*Platystylopterus*) are recognisable by their comparatively great size and strength, and the unusual development of the shafts of the exterior quills ; the tail is straight at its extremity ; the beak short and powerful, and almost straight.

THE FAWN-COLOURED SABRE-WING.

The FAWN-COLOURED SABRE-WING (*Platystylopterus rufus*) is about five inches and a half long, and seven broad. In this species the mantle and central tail-feathers are of a bronze-like green, the under side brownish yellow, and the exterior tail-feathers brownish yellow with a black spot near the tip. This bird is an inhabitant of Guatemala. We are entirely without particulars as to its life and habits.

The JEWEL HUMMING BIRDS (*Hypophania*) have a powerful and slightly-curved beak and small foot, in some instances covered with down ; the wing, which somewhat resembles that of the *Oreotrochilus*, is sometimes short, sometimes long ; in the otherwise short tail two of the feathers are generally much prolonged.

THE CRIMSON TOPAZ HUMMING BIRD.

The CRIMSON TOPAZ HUMMING BIRD (*Topaza pella*), one of the most splendid species of this highly bedizened group, has the crown of the head and a line about the throat of velvety blackness ; the rump is copper-colour, shading into rich deep red, and glistening with a golden light ; the wing-covers are green ; the throat is golden in some lights, emerald-green in others, glancing with the yellow radiance of the topaz ; the quills are reddish brown ; the centre tail-feathers, which project three inches beyond the rest, are chestnut-brown, and those at the exterior reddish brown. The female is principally of a greenish hue, with a red throat, and is far less resplendent than her mate. The length of this bird, including the long tail-feathers, exceeds eight inches.

We learn from Gould that Cayenne, Trinidad, Surinam, and the fluviatile regions of the Lower Amazon are the native habitat of this gorgeous species, which may be regarded, not only as one of the gems of ornithology, but as one of the most beautifully-adorned species of the *Trochilida*.

Mr. Waterton thus describes the Crimson Topaz in his "Wanderings :"—"One species alone never shows his beauty to the sun ; and were it not for his lovely shining colours you might almost be tempted to class him with the Goatsuckers, on account of his habits. He is the largest of all the Humming Birds, and is all red and changing gold-green, except the head, which is black. He has two long feathers in the tail, which cross each other, and these have gained him from the Indians the name 'Karabinite,' or 'Ara Humming Bird.' You never find him on the coast, or where the river is salt, or in the heart of the forest, unless fresh water be there. He keeps close by the side of woody fresh water rivers and dark lonely creeks ; he leaves his retreat before sunrise to feed on the insects near the water ; he returns to it as soon as the sun's rays cause a glare of light ; he is sedentary all day long, but comes out again for a short time after sunset." The nest, represented in our woodcut, is deeply cup-shaped, the walls exceedingly thin, and the whole structure composed apparently of fragments of a species of fungus, very much resembling German tinder, bound together by cobwebs or some similar material. The two white eggs are about five-eighths of an inch in length.

THE BLACK-CAPPED HUMMING BIRD.

The BLACK-CAPPED HUMMING BIRD (*Aithurus polytmus*) has a short, slightly-forked tail, the two outer feathers of which are prolonged six inches beyond the rest. The male has a long tuft over each ear, and is velvety black on the crown of the head ; the mantle is green ; the under side glossy emerald-green, shading into blueish black on the belly and tail-covers ; the quills are purplish black ; the tail-feathers deep black, with a greenish shade towards the roots ; the eye is deep brown, the beak bright red, tipped with black, and the foot brown ; the male is ten inches long, and six broad ; his

THE CRIMSON TOPAZ HUMMING BIRD (*Topaza pella*).

wing measures two inches and three-quarters, and his tail seven inches and a quarter. The female, whose length does not exceed four inches and a half, with wings two inches and a quarter, and the tail one inch and seven-eighths long, is of a copper-green on the mantle, and white beneath ; her sides are spotted with green.

“This Humming Bird,” says Mr. Gosse, “is the gem of Jamaican ornithology. Its slender form, velvet crest, emerald bosom, and lengthened tail-plumes render it one of the most elegant members of its truly brilliant family. It is a permanent resident in Jamaica, and is not uncommonly seen at all seasons and in all situations. It loves to frequent the margins of roadsides, where it sucks the blossoms of the trees, occasionally descending, however, to the lower shrubs ; and is abundant on the summits of the range of mountains known as the Bluefield Ridge. Behind these peaks, which

are visible from the sea, at an elevation of half a mile, there runs through the dense woods a narrow path, just passable for a horse, overrun with beautiful ferns of many graceful forms, and always damp and cool. No habitation occurs within several miles, and no cultivation, save the isolated provision grounds of the negroes, which teem with enormous arums, and are hidden from view in the thick woods. The refreshing coolness of the roads, the unbroken solitude, combined with the peculiarity and luxuriance of the vegetation, made it one of my favourite resorts. Not a tree, from the thickness of one's wrist to the gigantic magnitude of the hoary fig and cotton tree, but is clothed with gigantic parasites. Begonias with waxen leaves and ferns with hirsute stems climb up the trunks of enormous bromelias; various orchids, with matted roots and grotesque blossoms, spring from every bough; and long lianas, like the cordage of a ship, depend from the loftiest branches or stretch from tree to tree. Elegant tree-ferns and towering palms are numerous. Here and there the wild plantain waves its long flag-like leaves from amidst the humbler bushes; and in the most obscure corners, over some decaying log, nods the noble spike of a magnificent limed arum. Nothing is flaunting or showy; all is solemn and subdued, but all is exquisitely beautiful. The underwood consists largely of the plant called glass-eye berry, the blossoms of which, though presenting little beauty in form or hue, are eminently attractive to the Long-tailed Humming Bird. These bushes are at no part of the year out of blossom, their scarlet berries appearing at all seasons on the same stalk as the flowers; and here, at any time, one may with tolerable certainty calculate on finding these very lovely birds; but it is in March, April, and May that they abound. I suppose that I have sometimes seen not fewer than a hundred come successively to rifle the blossoms within the space of as many yards in one forenoon. They are, however, in no respects gregarious; though three or four may be seen at one moment hovering round the blossoms of the same shrub, there is no association—each is governed by its individual preference, and each attends to its own affairs. It is worthy of remark that males compose by far the greater portion of the individuals observed at this elevation, while very few females are seen there; whereas in the lowlands this sex outnumbered the other. In March a considerable number are seen to be clad in the livery of the adult male, but without the long tail-feathers, whilst others possess them in various stages of development. These are, I have no doubt, males of the preceding season. It is also common to find one of those lengthened feathers much shorter than the other; and in their aerial encounters with each other a tail-feather is sometimes displaced. The loud sound made by the strong vibration of the wings of the male is more shrill than that produced by those of the female, and indicates the proximity of the bird before the eye has detected it. The male utters an almost incessant chirp, both whilst resting on a twig or feeding from the flowers. They do not invariably probe the blossoms on the wing, but frequently when alighted and sitting with closed pinions; and they often partially sustain themselves whilst feeding by clinging with the feet to a leaf, with the wings expanded and vibrating. When perched, they usually sit in a nearly upright posture, with the head thrown backwards, the beak pointing at a small angle above the horizon, the feet almost hidden by the body being brought into contact with the perch, the tail thrust forward under the belly, and the long feathers crossing each other near their middle."

The nests, which are most numerous in June, are placed in a great variety of situations; that described by Mr. Gosse was "principally composed of silk-cotton, very closely pressed, mixed with the still more glossy cotton of an asclepias, particularly round the edge, the seeds remaining attached to some of the filaments. On the outside the whole structure is quite covered with spiders' webs, crossed and recrossed in every direction, and made to adhere by some viscous substance, evidently applied after the web was placed, probably saliva. Little bits of pale green lichen and fragments of thin laminated bark are stuck here and there on the outside, by means of the webs having been passed over them. The whole forms a very compact cup, one inch and three-quarters deep without, and

one inch deep within, the sides about a quarter of an inch thick, the inner margin a little overarched, so as to narrow the opening ; the total diameter at the top one inch and a half. The eggs are of a long oval form and pure white, save that when fresh the contents produce a reddish tinge, from the thinness of the shell. The above are the usual form, dimensions, and materials of the nest. Variations, however, often occur from local causes : thus, in one from a rocky situation only moss is used, and the base is prolonged to a point ; one now before me is wholly composed of pure silk-cotton, bound profusely with the finest web, undistinguishable except on the closest examination, not a fragment of lichen mars the beautiful uniformity of its appearance ; others are studded all over with lichens, and have a peculiar rustic prettiness. Insects constitute the principal food of this species, which obtains them from the flower-cups, and also catches them whilst on the wing."

The WOOD-NYMPHS (*Lampornis*) possess a straight or moderately-curved beak, which is broad at its base and incised at its extremity ; the long toes are armed with short, high, and very decidedly-hooked claws ; the wings are slender, and the tail broad, rounded or slightly incised at its extremity. The sexes vary considerably in their coloration.

THE MANGO HUMMING BIRD.

The MANGO HUMMING BIRD (*Lampornis mango*) represents a group recognisable by their long, flat, broad, and curved beak, and by their short, rounded tail. In this species, which is about four inches and three-quarters long and seven inches and a half broad, with wing measuring two inches and three-quarters and tail one inch and a half, the entire mantle is of metallic green, glistening with a bright copper shade ; the greyish black quills gleam with violet, and the centre tail-feathers, which are green shaded with red above, are blueish red beneath, and have a brilliant purplish black border ; the exterior tail-feathers are entirely blueish red, with a similar edge. The throat, neck, breast, and upper part of the belly are of rich velvety black, shading into steel-blue at the sides ; the lower portion of the belly is of copper-green. The beak of the adult is black, that of the young brown, and the foot black. The female is paler than her mate on the mantle, and white striped with black on the under side ; her body is four inches and three-quarters long and seven and a half broad ; the wing measures two inches and three-quarters and the tail one inch and a half.

The Mango, we learn from M. Boucier, though one of the most widely-spread members of its family, is only to be met with in hot localities ; and whenever it occurs in the interior of a country, it is invariably in the warmest valleys. In disposition it is wild and quarrelsome, for although it lives in societies, several always being together, it is continually engaged in fighting with its companions and in driving away all other birds that approach the trees in which it is breeding. It inhabits Bolivia, Guiana, and Brazil. The adult does not assume its perfect plumage until the end of the second year, and in the interval passes through so many changes that the variety of appearance it presents has given rise to the various names under which these birds have been described ; those obtained in Bolivia are a trifle the largest, and have the bands of green and blue at the sides of the neck a little less brilliant ; in fact, the hotter the climate in which they dwell the brighter is their general appearance—the black of the throat is more intense, the green on the back and rump finer, and the violet of the tail more lustrous. The flight of this species is very rapid. Mr. Reeves informs us that in Brazil the *Lampornis mango* is found in Rio Janeiro, Minas Gerves, St. Paul's, Santa Catherina, and Para. The Mango frequents gardens as well as the forests, and is very common in Rio in some seasons and equally scarce at others. The nest, according to Gould, is a round cup-shaped structure, placed near the extremity of a small horizontal branch, and is composed of any cottony or similar material that may be at hand, bound together with cobwebs, and ornamented with numerous

small pieces of lichens. The eggs are white, and two in number, half an inch long by three-eighths of an inch in breadth.

“Wishing to keep one of these birds alive,” says Mr. Gosse, “I stationed myself near a blossoming papau-tree, one evening, with a gauze ring-net in my hand, with which I darted at one, and though I missed my aim, the attempt so astonished it that it appeared to have lost its presence of mind, so to speak, flitting hurriedly hither and thither for several seconds before it flew away. The next morning I again took my station, and stood quite still; the net being held up close to an inviting branch of blossoms, the Humming Birds came near in their course round the tree, sipped the surrounding flowers, eyeing the net hanging in the air for a moment near the fatal cluster without touching it, and then, arrow-like, darting away. At length one, after surveying the net, passed again round the tree, and in approaching it the second time, and perceiving the strange object not to have moved, he took courage and began to suck. I quite trembled with hope; in one instant the net was struck, and before I could see anything the rustling of his wings within the gauze told me that the little beauty was a captive. I brought him in triumph to the house and caged him; but he was very restless, clinging to the sides and wires, and fluttering violently about. The next morning, having gone out on an excursion for a few hours, I found the poor bird on my return dying, having beaten himself to death. I never again took this species alive.”

THE RUBY AND TOPAZ WOOD-NYMPH.

The RUBY AND TOPAZ WOOD-NYMPH (*Chrysolampis moschita*), a most magnificently-adorned Brazilian Humming Bird, is brown on the crown of the head, with a glowing throat of ruby-red, and upper breast irradiated by a tint that can only be compared to the golden glow of sunrise. The wings gleam with a violet light, and the light brown tail has each feather relieved by a black border. The beak and feet are black. The female and young are metallic green above and grey on the under side. This species is four inches long and five broad, the wing measures two inches and the tail one inch and a half.

The central part of South America affords a home to this most exquisitely-ornamented little bird. “If any one species of this extensive family be better known than any other,” says Gould, “it is undoubtedly the Ruby and Topaz Humming Bird, for it is not only one of the earliest discovered, but its beauty is of such a character as to fix at once the attention of every observer. It is also one of the commonest of the entire group, and plays no inconsiderable part in commerce, as the capturing and preparing specimens, which are sent home by thousands, affords considerable employment to the Brazilian slaves and others in its native country; moreover, in Europe and elsewhere, this species always forms a conspicuous object in the groups of birds arranged under glass shades. But, alas! nothing is known as to its manner of life, for though it has been described for more than a hundred years, and its native country repeatedly visited by enterprising explorers, no one of them has placed on record any details as to its habits. It is said to perch occasionally, and spread its large, rounded tail to the fullest extent, like the Peacock. The cup-shaped nest is also known to be composed of cottony material, and decorated externally with leaves and small patches of lichens.”

The FLOWER-NYMPHS (*Florisugus*) are for the most part powerfully formed and large Humming Birds, with a short tail, scarcely exceeding the closed wing in length. The strong beak is not incised, and the sexes differ more or less in their coloration. Some of them appear to be migratory; at least, they would seem to approach the tropic during the colder parts of the year, and to retreat before the returning heat, thus maintaining an equable temperature.

THE BRAZILIAN FAIRY.

The BRAZILIAN FAIRY (*Heliothrix auriculata*), a species inhabiting Brazil, has an awl-shaped, delicate beak, small feet, furnished with short, curved claws, long, slender wings, and a long tail, formed of narrow feathers; the tail of the female is composed of broad feathers, and rounded at its extremity. In the adult male, the back and sides of the throat are bright copper-green, with a golden shimmer, and the greyish black quills glow with violet; the under side and three exterior tail-feathers are white, whilst those in the centre of the tail gleam with a steel-blue lustre; a line of velvety black commences beneath the eyes, and passes along the body, expanding as it goes, and gradually merging in a blueish border that surrounds it. The male is six inches and three-quarters long, with a tail of two inches and a half; the body of the female measures four inches and a half, and her tail one inch and seven-twelfths.

This beautiful bird is rare in Brazil, and in Guiana is replaced by a very similar species; it has also several representatives in the western parts of South America.

“Mr. Reeves,” says Gould, “informs me that this elegant bird inhabits Rio de Janeiro and Minas Gerves, but is nowhere very common; that it is not met with in the immediate vicinity of Rio, but that it arrives in Novo Fribourgo in July and remains till September. During its stay it evinces a decided preference for the flowers of the orange-tree, which doubtless afford it an abundant supply of some peculiar and congenial kind of insect food. Its flight is both powerful and rapid. The nest is of somewhat lengthened form, attached to the side of a small twig, and composed of fine, dry, dark brown vegetable fibres, coated externally with small flakes of pale olive and buff-coloured bark. Another example is of a still more elongated shape, attached on one side to a slender vertical twig, and composed of some cottony material, held together externally by cobwebs and patches of grey lichen.”

The FLOWER-SUCKERS (*Florisuga*) are distinguishable from the groups above described by the formation of their straight beak, which is flat only at its base, and towards its tip rises so considerably as to be higher than it is broad; the powerful feet are feathered on the tarsi, and armed with slightly-curved claws; the wings are long and slender, and the tail broad.

THE PIED JACOBIN.

The PIED JACOBIN (*Florisuga atra*) is almost entirely of a rich velvety black, with the exception of the vent and legs; the wing-covers are of a dull green, shaded with violet; the centre tail-feathers black with a blueish gloss, whilst those at the exterior are white tipped with black. The female is of duller hue, and has the cheeks and often the entire head rust-red; the feathers on her back are edged with yellowish red; the beak is deep black. This species is four inches and a half long; the wing measures two inches and two-thirds, and the tail one inch and a half.

“The true, if not the restricted habitat of the Pied Jacobin,” says Gould, “is the eastern portion of Brazil, over which it is distributed from Pernambuco on the north to Rio de Janeiro on the south, from which latter locality and Bahia great numbers are sent to Europe.” We are without particulars as to its life and habits.

The FAIRIES (*Trochilus*) have a moderate-sized, straight beak, slender, sickle-shaped wings, and very gorgeous plumage, which differs considerably in the two sexes. They are generally seen hovering fairy-like around the blossoms of trees and shrubs, apparently giving the preference to tubular flowers, probably on account of the insects which lurk within them.

THE RUBY-THROATED FAIRY HUMMING BIRD.

The RUBY-THROATED FAIRY HUMMING BIRD (*Trochilus colubris*) is easily recognisable by its awl-shaped beak, of medium size, and compressed at its base, its short, slender foot, long, narrow wing, and slightly-forked tail. The mantle and centre tail-feathers are green, enlivened with gold; the sides of the neck, throat, and breast are of a brilliant ruby-red, spotted with black; the rest of the under side is greyish white, intermixed with green; the quills and tail-feathers are purplish brown; the eye dark brown, and the beak and foot black. In the male the entire under side is white, and

THE BRAZILIAN FAIRY (*Heliethrix auriculata*).

the three exterior tail-feathers relieved by a white spot. The length of the body is three inches and a half, and the breadth four inches and a quarter. This species is found in all the eastern portions of the United States.

This beautiful little bird is pre-eminently migratory in its habits, a great portion of its life being spent in passing from north to south, and *vice versâ*. "The Ruby-throated Humming Bird," says Wilson, "makes its first appearance in Georgia, from the south, about the 23rd of March. As it passes on to the northward, as far as the interior of Canada, where it is seen in great numbers, the wonder is excited how so feebly-constructed and delicate a little creature can make its way over such extensive regions of lakes and forests among so many enemies, all its superiors in strength and size; but its very minuteness, the rapidity of its flight, which almost eludes the eye, and its admirable instinct or reason are its guides and protectors. About the 25th of April it usually arrives in Pennsylvania, and about the 11th of May begins to build its nest. This is generally fixed on the upper side of some

horizontal branch, not among the twigs, but where it is attached by the side to an old moss-grown trunk ; others may be found fastened on a strong, rank stalk or weed in the gardens, but these cases are rare. The nest, which is usually placed on a branch some ten feet from the ground, is about one inch in diameter, and as much in depth, and the outer coat of one now lying before me is formed of a small species of blueish grey lichen, thickly glued on with the saliva of the bird, giving firmness and consistency to the whole, as well as keeping out moisture. Within this are thickly-matted layers of the fine wings of certain flying seeds, closely laid together, and lastly the downy substance from the great mullein and from the stalks of the common fern lining the whole. The two eggs are pure white, and of equal thickness at both ends. On a person approaching their nest, the little proprietors dart around with a humming sound, passing within a few inches of his head, and should the young be nearly hatched the female will resume her place on the nest, even while the spectator stands within a yard or two of the spot. The precise period of incubation I am unable to give, but the young are accustomed, within a short time of leaving the nest, to thrust their bills into the mouths of their parents and suck out what they have brought them. As I have found their nests as late as the 12th of July, I do not doubt but that they frequently and perhaps usually raise two broods in the season.

“This Humming Bird is extremely fond of tubular flowers, and I have often stopped to observe his manœuvres among the blossoms of the trumpet flower. When arrived before a thicket of these in full bloom, he poises or suspends himself on wing for the space of two or three seconds so steadily that his wings become invisible or only like a mist, and you can plainly distinguish the pupil of his eye looking round with great quickness and circumspection ; the glossy golden green of his tail and the fire of his throat dazzling in the sun form altogether a most beautiful appearance. When he alights, which he frequently does, he always prefers the dry twigs of a tree or bush, where he dresses and arranges his plumage with great dexterity. His only note is a single chirp, not louder than that of a small cricket or grasshopper, generally uttered while passing from flower to flower, or when engaged in fight with his fellows ; for when two males meet at the same bush or flower a battle instantly takes place, and the combatants ascend in the air, chirping, darting, and circling round each other till the eye is no longer able to follow them—the conqueror, however, generally returns to the place to reap the fruit of his victory. I have seen him attack and, for a few moments, tease the King Bird, and have also seen him in his turn assaulted by a humble bee, which he soon put to flight.

“This beautiful and delicate species is extremely susceptible of cold, and if long deprived of the animating influence of the sunbeams droops and soon dies. A very fine male which was brought to me I put into a wire cage, and placed it in a retired, shaded part of the room. After fluttering about for some time, the weather being uncommonly cool, it clung to the wires and seemed in a torpid state for the whole forenoon. No movement of breathing could be perceived on the closest inspection, though at other times this is remarkably observable, the eyes were shut, and when touched with the finger it gave no signs of life or motion. I carried it out into the open air, and placed it directly in the rays of the sun ; in a few seconds respiration became very apparent, the bird breathed faster and faster, opened its eyes, and began to look about with as much seeming vivacity as ever. After it had completely recovered it flew off to the top of a pine-tree, where it sat for some time dressing its disordered plumage, and then shot off like a meteor.

The flight of this Humming Bird from flower to flower greatly resembles that of a bee, but is so much more rapid that the latter appears a mere loiterer in comparison with him. He poises himself on wing, while he thrusts his long, slender, tubular tongue into the flowers in search of food. He sometimes enters a room by the window, examines the bouquets of flowers, and has been known to

return regularly every evening for several days together. From the blossoms of the towering tulip-tree, through a thousand intermediate flowers, to those of the humble larkspur, he ranges at will and almost incessantly. About the 20th of September these birds generally retire south, and about November pass the southern boundary of the United States into Florida."

"No sooner," says Audubon, "does the returning sun again introduce the vernal season, and cause millions of plants to expand their leaves and blossoms to his genial beams, than this Humming Bird is seen advancing on fairy wings, carefully visiting every flower-cup, and, like a curious florist, removing from each the injurious insects that would otherwise, ere long, cause their beauteous petals to droop and decay. Poised in the air, it is observed peeping cautiously and with sparkling eye into their innermost recesses, whilst the ethereal motion of the pinions, so rapid and so light, appears to fan and cool the flowers without injury to their fragile texture, and produces a delightful murmuring sound. Its long delicate beak enters the cup of the flower, and the protruded double tongue, delicate, sensitive, and imbued with a glutinous saliva, touches each insect in succession and draws it from its lurking-place to be instantly swallowed. All this is done in a moment, and the bird as it leaves the flower sips so small a portion of its liquid honey that the theft we may suppose is but a benefit to the flower, which is thus relieved from the attacks of its destroyers. The prairie, the fields, the orchards, and the gardens, nay, the deepest shades of the forest, are all visited in their turn, and everywhere the little bird meets with pleasure and with food. Its gorgeous throat in beauty and brilliancy baffles all description. Now it glows with a fiery hue, and again it changes to the deepest velvet-black. The upper parts of its body are of resplendent changing green, and it throws itself through the air with a swiftness and vivacity hardly conceivable; it moves from flower to flower like a gleam of light, upwards and downwards, to the right and to the left. During their migrations they pass through the air in long undulations, raising themselves for some distance at an angle of about 40° , and then falling in a curve; but the smallness of their size precludes the possibility of following them farther than fifty or sixty yards without great difficulty, even with a good glass. They do not alight on the ground, but settle on twigs and branches, where they move sideways in prettily-measured steps, frequently opening and closing their wing, pluming, shaking, and arranging the whole of their apparel with the utmost neatness and activity; they are particularly fond of spreading one wing at a time, and passing each of the quill-feathers through their bill in its full length, when, if the sun be shining, the wing thus plumed is rendered extremely transparent and light. They quit the twig without the slightest difficulty in an instant, and appear to be possessed of superior powers of vision, making directly towards a Marten or Blue Bird when fifty or sixty yards before them, before it seems aware of their approach. Their food consists principally of insects, generally of the coleopterous order, these, together with some equally diminutive flies, being commonly found in their stomachs. The first are procured within the flowers, but many of the latter on the wing. Where is the person," says Audubon, "who, on seeing this lovely little creature moving on humming winglets through the air, suspended as if by magic, flitting from one flower to another with motions as graceful as they are light and airy, pursuing its course and yielding new delight wherever it is seen—where is the person who, on observing this glittering fragment of a rainbow, would not pause, admire, and turn his mind with reverence towards the Almighty Creator, the wonders of whose hand we at every step discover, and of whose sublime conceptions we everywhere observe the manifestation in His admirable system of Creation?"

"When morning dawns, and the blest sun again
Lifts his red glories o'er the eastern main,
Then through our woodbines, wet with glittering dews,
The flower-fed Humming Bird his way pursues,

Sips with inserted tube the honied blooms,
 And chirps his gratitude as round he roams ;
 While richest roses, though in crimson drest,
 Shrink from the splendour of his gorgeous breast.
 What heavenly tints in mingling radiance fly !
 Each rapid movement gives a different dye—
 Like scales of burnished gold, they dazzling show ;
 Now sink to shade, now like a furnace glow.”

The following very interesting account of the demeanour of this delicate and interesting bird in captivity is given by Gould :—“ A *Trochilus colubris* captured for me by some friends pumped the fluid from a little bottle whenever offered it, and in this manner it lived with me a constant companion for several days, travelling in a little, thin gauze bag, distended with whalebone, and suspended to a button of my coat. It was only necessary for me to take the bottle in my hand to induce it to thrust its spiny bill through the gauze, protrude its lengthened tongue down the neck of the bottle, and pump up the fluid till it was satiated ; it would then fly to the bottom of its little home, preen its tail and wing feathers, and seem quite content.

“ The specimens I brought alive to this country were as docile and fearless as a great moth under similar treatment. The little cage in which they lived was twelve inches long, seven wide, and eight high. In this was placed a diminutive twig, and suspended to the side a glass phial, which I daily supplied with saccharine matter, in the form of sugar or honey and water, with the addition of the yolk of an unboiled egg. Upon this food they appeared to thrive and be happy during the voyage along the seaboard of America and across the Atlantic, until they arrived within the influence of the climate of Europe. The vessel in which I made the passage took a northern course, which carried us over the banks of Newfoundland, and although the cold was rather severe during part of the time, the only effect it appeared to have upon my little pets was to induce a kind of torpidity, from which they were rapidly aroused by placing them in the sunshine, in the bosom, or near a fire. I do assure my readers that I have seen these little creatures cold, stiff, and to all appearance dead, and that from this state they were readily restored by a little attention and removal into light and heat, when they would ‘ peck up,’ flutter their tiny wings, and feast away as if in the best state of health.”

The AMETHYST HUMMING BIRDS (*Calliphlox*) have a delicate, pointed beak, exceeding the head in length ; the legs are slender and the toes and claws short, the latter much hooked and sharply pointed. The wings are short ; the tail of the male, composed of narrow feathers, is forked at its extremity, whilst that of the female is quite straight.

THE AMETHYST HUMMING BIRD.

The AMETHYST HUMMING BIRD (*Calliphlox amethystina*) is numerous met with in the interior of Brazil. This resplendent little bird is of a dark metallic green, shaded with pale gold on the back ; the neck, cheeks, and throat glow with the brilliant hue of the amethyst, and are divided from the under side by a line of pure white ; the breast and belly are blackish grey, shaded with copper-red, the lower tail-covers are light grey, bordered with white, and the quills greyish brown, tinted with violet. The centre tail-feathers are of a metallic green, and those at the exterior greyish brown. The female has a white throat, and her tail edged with reddish yellow ; the young resemble their mother. This species is three inches and one-third long and about the same in breadth ; the wing measures one inch and a half, the tail of the male one inch and a quarter, while that of the female does not exceed two-thirds of an inch.

According to Mr. Reeves, “ the Amethyst inhabits the interior provinces of Bahia, Rio de



Plate 25, Cassell's Book of Birds

TOPAZA PELLA

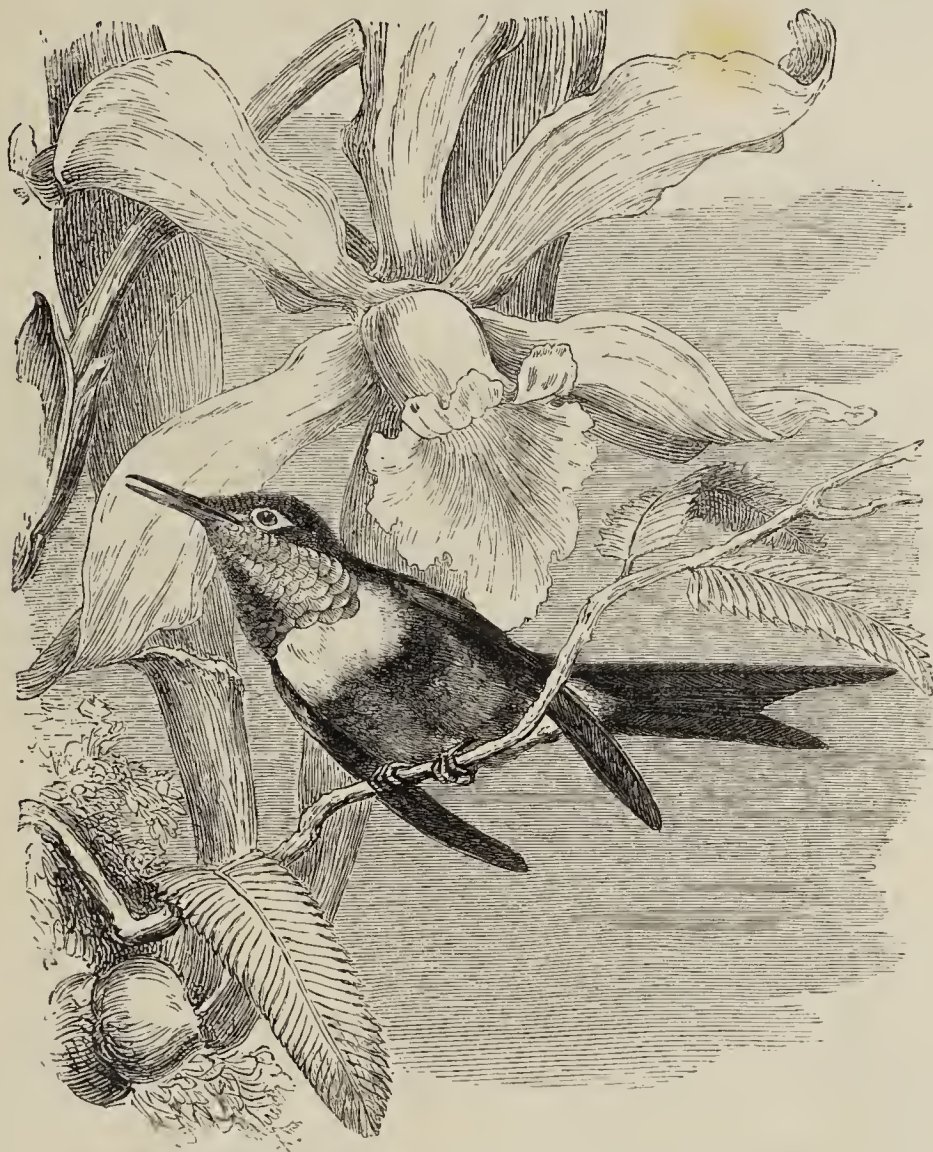
CRIMSON TOPAZ

(Life size)

(Gould)



Janeiro, Novo Fribourgo, and Minos Gerves, but is nowhere very common; it frequents gardens when the orange-trees are in flower, the valleys when the marrioneira is blooming, and the forests when the blossoms elsewhere are no longer inviting. It arrives in Rio in July, is most numerous in September and October, and departs again on the approach of the hot season. Its nest is invariably placed in the highest and driest trees."



THE AMETHYST HUMMING BIRD (*Calliphlox amethystina*).

The WOOD-STARS (*Calothorax*, or *Lucifer*) are principally distinguishable by the peculiar formation of the male bird's tail, which is much forked, and composed of short, stiff, narrow feathers; in some species the exterior tail-feathers are very short and almost without web. The tail of the female is straight, and her wings of moderate size; the beak is long, thin, and slightly curved.

MULSANT'S WOOD-STAR.

MULSANT'S WOOD-STAR (*Calothorax Mulsanti*) is a very beautiful species of Humming Bird, inhabiting Columbia and Bolivia; the male is dark green on the back and sides, with a brilliant gloss; the chin, cheek-stripes, lower part of throat, a streak on the centre of the breast and the belly are white, the chin relieved by a violet sheen. The back of the female is lighter than that of her mate, her under side is white, and the lower tail-covers of brownish red; a line on the sides of the

throat is deep olive-green, and the tail light brown, tipped with black. The habitat of this species, according to Gould, is confined to the temperate regions of Columbia.

The ELVES (*Lophornithes*), a most magnificent group of Humming Birds, are recognisable by the remarkable tufts of feathers that adorn, sometimes the head, sometimes the tail of the males of different species. The awl-shaped beak is somewhat flattened at its base; the feet are usually small, the toes short, and the claws long. The plumage of the male is rich and much variegated, while that of the female is very plain.

The PLOVER-CRESTS (*Cephalolepis*) possess a delicate awl-shaped beak, scarcely equalling the head in length; the toes are short, and armed with long thin claws; the wings are short, the tail comparatively long, and composed of broad feathers. The feathers on the head of the male are prolonged into a crest.

DE LALAND'S PLOVER-CREST.

DE LALAND'S PLOVER-CREST (*Cephalolepis Delalandii*), a very beautiful species, inhabiting Brazil, is of a pale but very pure metallic green on the back and centre tail-feathers. The crest that adorns the head is bright, light green, becoming darker towards its apex; in old age this plume changes to a steel-blue; the under side is dark grey; a patch that commences at the throat, and covers the breast and centre of the belly, is bright blue; the quills are greyish brown, shaded with violet; the exterior tail-feathers are black, edged with white; the beak is black, and the foot blackish brown. The female and young are without the crest and the blue patch on the breast. The body of this species is three inches and a half long; the wing measures two inches, and the tail one inch. The crest of the male is one inch and two-thirds long.

This graceful species of Humming Bird was first discovered by M. Delaland, in the southern portion of Brazil. Mr. Reeves states that it inhabits Rio de Janeiro, Minas Gerves, and Santa Catherina, but he was unaware whether it remains in those provinces all the year or not. "Of the two nests that I possess," says Mr. Gould, "one is of much more lengthened form than the other, but both are composed of the same materials, namely, fine fibrous roots, moss, lichens, and involucre of a composite plant, the whole matted together with spiders' webs of so fine a kind that they are almost imperceptible. Both had been suspended among the slender twigs of a species of banana."

The COQUETTES (*Lophornis*) are remarkable for the magnificent collar that adorns their neck, formed of long, narrow, and most delicately-marked feathers; this collar can be raised or laid back at pleasure. The head is usually embellished by a crest; the awl-shaped beak equals the head in length; the wings are small and slender; the tail is composed of broad, long feathers.

THE SPLENDID COQUETTE.

The SPLENDID COQUETTE (*Lophornis ornata*), a very richly-tinted species, inhabiting Guiana, is of a bronze-green on the rump; the crest is brownish red, and a white line passes over the lower part of the back; the region of the face is green, with a most brilliant lustre; the graduated feathers that form the collar are light reddish brown, spotted with glowing green; the quills are deep purplish brown, and the beak flesh-pink, tipped with brown. The female is much paler, and entirely without the crest, collar, and green about the beak—features that so materially enhance the beauty of the male.

"This glorious little bird," says Gould, "which is strictly an inhabitant of the lowland districts

of tropical America, enjoys a somewhat extensive range over the eastern part of that continent, being found from the Caraccas on the north to Brazil on the south, and is particularly numerous in all the intermediate countries of Demerara, Surinam, and Cayenne ; it is also equally abundant in the island of Trinidad. Prince Max of Wied states that in Brazil he found it on dry and arid plains, clothed with a scanty and bushy vegetation ; and such would seem to be the habit of the bird in Trinidad, since it there flies around the low, flowering shrubs of the open part of the country, rather than in the



THE SPLENDID COQUETTE (*Lophornis ornata*).

more wooded or forest districts. The nest is a cup-shaped structure, composed of some cottony material, bound together with cobwebs, and decorated externally with small pieces of lichen and mosses."

Mr. Tucker states that "this species frequents the pastures and open places, and visits the flowers of all the small shrubs, but is particularly fond of those of the ipecacuanha plant ; and that it is very pugnacious, erecting its crest, throwing out its whiskers, and attacking every Humming Bird that passes within the range of its vision."

The AMAZONS (*Bellatrix*) have a smaller collar and larger crest than the above group.

THE ROYAL AMAZON.

The ROYAL AMAZON (*Bellatrix regina*), a beautiful species inhabiting Columbia, closely resembles the bird last described, but with these differences: the rump is a copper-colour and the lower part of the back striped with white; the tail is brown, the quills purplish brown, and the collar emerald green; each of its feathers spotted with red. The crest is formed of long, narrow, bright red feathers, some of which have a deep metallic green spot at the tip.

THE HORNED SUN-GEM (*Heliactinus cornutus*).

The SUN-GEMS (*Heliactinus*) are distinguishable from the above group by the superior length of the tail and crest; the wing is long and slender, the tail much graduated, and formed of narrow, pointed feathers. The beak is longer than the head, and increases slightly in thickness towards its delicate tip. The feet are small, and the claws short and powerful.

THE HORNED SUN-GEM.

The HORNED SUN-GEM (*Heliactinus cornutus*) is of a steel-blue on the crown of the head; the collar beautifully shaded, from violet, green, yellow, and orange to red; the throat, neck, and

cheeks are deep rich black; the upper breast, centre of the belly, rump, and exterior tail-feathers white, and the quills grey. The female is without the collar and crest, her throat is reddish yellow, and the outer feathers of the tail striped with black at their centre. The beak is black. This species is four inches and a half long, the wing measures two inches, and the tail from two to two and a half inches.

“The Horned Sun-gem,” says Gould, “is an inhabitant of the mountain ranges of Brazil,



THE WHITE FOOTED RACKET-TAIL (*Steganurus Underwoodii*).

particularly those of Minos Gerves, and well does this elegant little bird represent in the air the brilliant that is hidden in the deep primitive rocks over which it flies, fairy-like in form and colour; we might easily imagine that one of the jewels had become vivified, and had taken wing.”

We are told by M. Bourcier that “during the dry season it principally frequents the open country in the neighbourhood of marshes, and obtains its food from the small plants which there abound; during the rainy season it re-enters the woods, where it seeks its food among the various orchids.”

The SYLPHS (*Lesbiæ*) are principally distinguished by their long, forked tails.

The RACKET-TAILED SYLPHS (*Steganurus*) have the outer tail-feathers much prolonged, and almost naked except at their extremities, where the barbs are broadly dilated.

THE WHITE-FOOTED RACKET-TAIL.

The WHITE-FOOTED RACKET-TAIL (*Steganurus*, or *Spathura Underwoodii*) is remarkable for the unusual prolongation of the exterior tail-feathers; these are partially denuded of the web, and at the end of the shaft are enlarged into a broad disc; the beak is short and almost straight, and the small tarsus thickly covered with down. The entire mantle, belly, sides, and lower tail-covers are copper-green, the breast and throat brilliant green; the quills are purplish brown, the tail brown, and the disc at the extremity of the exterior feathers black, with a green shade. The length of the male is five inches and a half, the wing measures one inch and three-quarters, and the tail one inch and three-eighths. The female is copper-green on the back, and white, spotted with green, on the under side; the lower tail-covers are brown, and the tail-feathers, which are of almost equal length, are tipped with white.

"This species," says Gould, "enjoys a range of habitat over the Columbian Andes from the 3rd to the 10th degree of north latitude, but appears to be confined to the region ranging between 5,000 and 9,000 feet above the level of the ocean; it is abundant in the neighbourhood of Santa Fé de Bogota, and numerous in Galipan, between La Guayra and the Caraccas. Mr. Dyson informs me that when hovering before a flower the action of its wings is exceedingly rapid, that it produces a loud humming sound, and the large spatules at the end of the outer tail-feathers show very conspicuously, being kept in continual motion by the rapid movements of the bird, and the repeated closing and expanding of its tail; its white-booted legs are equally noticeable. It is strictly an inhabitant of the hills, and loves to examine the flowers growing in the open passes and glades of the forest for its insect food, which it procures from the highest trees, as well as from branches near the ground. During its flight, it passes through the air with arrow-like swiftness, the tail being carried in a horizontal position."

Mr. Gosse gives the following interesting account of one of the many attempts he made to rear two young males of this beautiful species. The subjects of this experiment were not confined in a cage, but kept in a room with doors and windows close shut. "They were lively, but not wild; playful towards each other, and tame with respect to myself, sitting unrestrained for several seconds at a time on my finger. I collected a few flowers, and placed them in a vase on a high shelf, and to these they resorted immediately; but I soon found that they paid attention to none but *Asclepias corrassavica*. On this, I again went out and gathered a large bunch of asclepias, and was pleased to observe that on the moment of my entering the room one flew to the nosegay and sucked while I held it in my hand. The other soon followed; and then both these lovely creatures were buzzing together within an inch of my face, probing the flowers so eagerly as to allow their bodies to be touched without alarm. These flowers being placed in another glass, they visited each bouquet in turn, now and then flying after each other playfully through the room, or alighting on various objects. Although they occasionally flew against the window, they did not flutter and beat themselves at it; but seemed well content with their lot. As they flew I repeatedly heard them snap their beaks, at which time they doubtless caught minute flies. After some time, one of them suddenly sank down into one corner, and on being taken up seemed dying; it lingered awhile and died. The other continued his vivacity. Perceiving that he exhausted the flowers, I prepared a tube, made of the barrel of a goose-quill, which I inserted into the cork of a bottle, to secure its steadiness and upright position, and filled it with juice of sugar-cane. I then took a large *Ipomea*, and having cut off the bottom, slipped the flower over the tube so that the quill took the place of the nectary of the flower. The bird flew to it in

a moment, clung to the bottle's rim, and bringing his beak perpendicular, thrust it into the tube. It was at once evident that the repast was agreeable, for he continued pumping for several moments; and on his flying off I found the quill emptied. As he had torn off the flower in his eagerness for more, and even followed the fragments as they lay on the table to search them, I re-filled the quill, and put a blossom of the marvel of Peru into it, so that the flower expanded over the top; the little toper found it again, and after drinking freely, withdrew his beak, but the blossom was adhering to it as a sheath. This incumbrance it got rid of, and then returned immediately, and, inserting his beak into the bare quill, finished the contents. It was amusing to see the odd position of his body as he clung to the bottle, with his beak inserted perpendicularly into the cork. Several times in the evening he had recourse to his new fountain, and at length betook himself to a line stretched across the room for repose. He slept, as they all do, with the head not behind the wing, but slightly drawn back on the shoulders. In the morning I found him active before sunrise, having already emptied his quill of syrup. After some hours, he flew through a door I incautiously left open, and, to my great chagrin, escaped.

“Another male that I kept became so familiar, even before I had had him for a day, as to fly to my face, and, perching on my lip or chin, thrust his beak into my mouth and suck up the moisture. He grew so bold and so frequent in his visits as at length to become almost annoying, and so pertinacious as to thrust his protruded tongue into all parts of my mouth, searching between the gum and cheek or beneath the tongue. Occasionally I gratified him by taking into my mouth a little of the syrup, and inviting him by a slight sound which he had learnt to understand. This bird and his companions in captivity early selected his own place for perching, without invading his neighbours'. So strong was this predilection, that on my driving one away from his spot he would flutter round the room, but try to alight there again, and if still prevented would hover near the place as if much distressed. The boldest of these birds was rather pugnacious, occasionally attacking one of his gentler and more confiding companions, who always yielded and fled. After a day or two, however, the persecuted one plucked up courage, and actually played the tyrant in his turn, interdicting his playfellow from sipping at the sweetened cup. Twenty times in succession would the thirsty bird drop down upon the wing to the glass, which stood at the edge of a table immediately beneath that part of a line where both were wont to perch; but no sooner was he poised in front, and about to insert his tongue, than the other would dart down with inconceivable swiftness, and wheeling so as to come up beneath him, would drive him from his repast. He might fly to any part of the room unmolested, but an approach to the cup was the signal for an instant assault. The ill-natured fellow himself took long and frequent draughts.

“When these birds were accustomed to the room, their vivacity was extreme; as manifested in their upright position and quick turns and glances when sitting, which caused their brilliant breasts to flash out from the darkness into sudden lustrous light, like rich gems; and no less by their startings hither and thither, and their most graceful wheelings and evolutions in the air, so rapid that the eye was frequently baffled in attempting to follow their motions.”

The COMETS (*Sparganura*) possess a very remarkably graduated tail, the outer feathers of which are five times as long as those in the centre.

THE SAPPHO COMET.

The SAPPHO COMET (*Sparganura Sappho*) is bright scarlet on the back, and of a metallic green on the head and under side; the throat, of a lighter shade, is lustrous, and the lower part of the belly light brown; the quills are purplish brown, the tail-feathers brown, very glossy at the base,

and bright fiery orange towards the deep brown tip. The female is green on the mantle, and spotted grey on the under side; her tail is short, and its feathers of an uniform light red.

“No combination of gorgeous colouring,” says Dr. Tschudi, “can exceed that which is presented in the plumage of this Humming Bird, as it appears and disappears like a dazzling flash of coloured light. It haunts the warm, primeval forests, but is still more frequently found in the pure atmosphere of the ceja-girded montañas.”



THE SAPPHO COMET (*Sparganura Sappho*).

“One of the principal summer haunts of this bird,” writes M. Bourcier, “is Chuquesaca, in the interior of Bolivia, where it appears when the fruit-trees of the country are in flower, and is met with in the greatest numbers among the flowers of the capulo, a kind of cherry-tree; it also visits the orchards and gardens of the city during the blossoming of the apple-trees. It is by no means shy, and the males are constantly at war, chasing each other with the utmost fury, uttering at the same time a sharp cry, whenever one bird invades another’s territory.”

“Soon after the arrival of these birds in Chuquerca,” says Bonelli, “the task of incubation commences, and when the summer is over, both the old and young, actuated, as it were, by the same impulse, wend their way southward, to return again when the sun has once more gladdened



HUMMING BIRDS.

the earth. The nest is a somewhat loose structure, outwardly composed of interlaced fibres, slight twigs, and moss, and frequently lined with soft hair, like that of the Viscacha (*Lagostomus tridactylus*), with the lower portion prolonged considerably below the bottom of the cup-shaped interior, which is about an inch and a half in diameter and an inch in depth; the total length of the nest averaging from two inches and a half to three inches. The little structure is placed in situations similar to those selected by the Spotted Flycatcher, namely, against the sides of the gully, supported or entirely sustained by any hanging root or twig that may be best adapted to afford it security; the part of the nest next the wall is much thicker, but of a coarser texture than the circular portions of the structure. The two eggs are oblong in form, of a pure white, and about half an inch in length. The difficulty of shooting these birds is inconceivably great, from the extraordinary turns they make when on the wing: at one instant darting headlong into a flower, at the next describing a circle in the air with such rapidity that the eye, unable to follow the movement, loses sight of it until it again returns to the flowers."

The MASKED HUMMING BIRDS (*Microrhamphi*) have a short, straight beak, moderately long and broad wings, and long, forked tail, which occasionally varies in its formation. The head and neck are adorned with peculiar tufts of feathers.

THE SHARP-BEARDED MASKED HUMMING BIRD.

The SHARP-BEARDED MASKED HUMMING BIRD (*Microrhamphus oxygogon*).—"I met with this fine species," says M. Linden, "for the first time in August, 1842, while ascending the Sierra Nevada de Merida, the crests of which are the most elevated of the eastern branch of the Columbian Cordilleras. It inhabits the region immediately beneath the line of perpetual congelation, at an elevation of from 12,000 to 13,000 feet above the level of the sea; it appears to be confined to the region between the 8th and 7th degree of north latitude. It occasionally perches on the scattered shrubs of this icy region, but most frequently on the projecting ledges of the rocks near to the snow. Its flight is swift, but very short. When it leaves the spot upon which it has been perched, it launches itself obliquely downwards, uttering, at the same time, a plaintive whistling sound, which is also occasionally uttered when perched; as far as I can recollect, I never heard it produce the humming sound made by several other members of the group, nor does it partake of their joyous spirit and perpetual activity. Its food appears to consist of minute insects, all the specimens we procured having their stomachs filled with small flies."

"This bird," says Gould, "is never met with at a less elevation than 9,000 feet. It might be thought that such bleak and inclement situations were ill-adapted for so delicate a structure as that of the Humming Bird; but there and there only does it dwell, while the equally lofty paramas of Bogota are the native locality of the nearly-allied species, *Oxygogon Guerini*. The minute insects which frequent the Alpine flowers of these districts afford abundance of food to these birds, and their bills are beautifully constructed for searching amongst the flowers in which these are found."

THE COLUMBIAN THORNBILL.

The COLUMBIAN THORNBILL (*Ramphomicron heteropogon*) has only the feathers on the neck prolonged; the beak is sharp and pointed; the wings narrow, and of medium length; the broad tail is deeply forked. The entire mantle is of copper-green, the brow deep, rich green; and the long feathers on the throat of a somewhat metallic green in the centre, and orange-red at the roots and edges; the lower belly is greyish white, quills purplish brown, and tail greenish brown.

"The high lands of Columbia," says Gould, "from Venezuela to some distance north of Santa

Fé de Bogota, are the natural habitat of this fine species. It is there very generally spread over the temperate regions of the country, never ascending to the snow-capped hills, nor descending to the hot plains below, but frequenting the warm valleys, where a luxuriant vegetation, teeming with insect life, affords it a never-ceasing supply of nourishment. The comparatively short and feeble bill points out that minute insects constitute its principal food, and as its structure is so similar to the other species of the genus, we may infer that, like them, it tranquilly flits about among the low shrubs in secluded valleys, and does not ascend to the loftier trees."

The HELMET CRESTS (*Oxyptogon*) have a helmet-shaped crest, broad wings, a straight tail, and lustreless plumage.

LINDEN'S HELMET CREST.

LINDEN'S HELMET CREST (*Oxyptogon Lindeni*) is of an uniform pale copper-colour on the mantle and under side; a spot on the brow and sides of the head are black; the sides of the throat and the longest crest and neck-feathers are white; the feathers of the tail are brown, with white shafts. The length of this species is five inches and a half: the wing measures three inches, and tail two and a half. Linden first discovered this very striking bird in the Sierra de Morida, in Columbia, where it was living at an elevation of from 12,000 to 13,000 feet above the level of the sea.

THE LIGHT-BEAKS (*Levirostris*).

THE birds belonging to this order possess in common a moderate-sized or long and sharp beak, which is either quite straight or slightly curved. The legs are extremely small and feeble, rather adapted to a sedentary life than formed for locomotion. The plumage is thick, compact, and usually brilliantly tinted.

The BEE-EATERS (*Meropes*) comprise some of the most beautiful birds inhabiting the Eastern Hemisphere, and present so many peculiarities as to render their identification easy. Their body is very slender; the beak longer than the head, with both mandibles slightly curved, the upper one a trifle longer than the lower; the culmen, margins, and tip are sharp; the short, small foot has three toes, the exterior of which is connected with that in the centre as far as the second joint, whilst the inner toe is not joined to the latter beyond the first joint; the claws are long, hooked, sharp, and furnished with a prominent ridge on the inner side; the wing, in which the second quill exceeds the rest in length, is long and pointed; the tail is long, either straight, forked, or slightly rounded at its extremity; in some species the centre tail-feathers are twice as long as those at the exterior. The brilliantly variegated plumage is short and thick; the sexes are almost alike in colour, and the young acquire the same hues as their parents within the second year.

One species of Bee-eater is found in Australia; but with this exception all the members of this group inhabit the Eastern Hemisphere. As regards their general habits, the Bee-eaters nearly resemble the Swallows, and, like them, are to be seen darting through the air when the sun is shining, in active pursuit of the insect hosts. Insects afford these pretty birds their principal means of subsistence, and, as their name implies, they eagerly devour large quantities of bees and wasps. The nests of the Bee-eaters are usually placed near together in holes in the ground or sand, and contain from four to seven pure white eggs.

THE COMMON BEE-EATER.

The COMMON BEE-EATER (*Merops apiaster*) (Coloured Plate XXIV.), one of the largest members of this family, is ten inches long and seventeen broad; the wing measures five inches and one-third, and the tail from four inches to four and a quarter. In this species the brow is white, and top of the head green; the nape, sides of the neck, and centre of the wings are chestnut-brown; the back is yellow, with a greenish gloss; the cheek-stripes, which terminate at the back of the neck, and a line around the pale yellow throat are black; the under side and rump are blue or blueish green; the quills grass-green, blue on their outer web, and tipped with black; the tail-feathers are blueish green, shaded with yellow, the long centre pair are also tipped with black; the eye is bright red, the beak black, and the foot of a reddish hue.

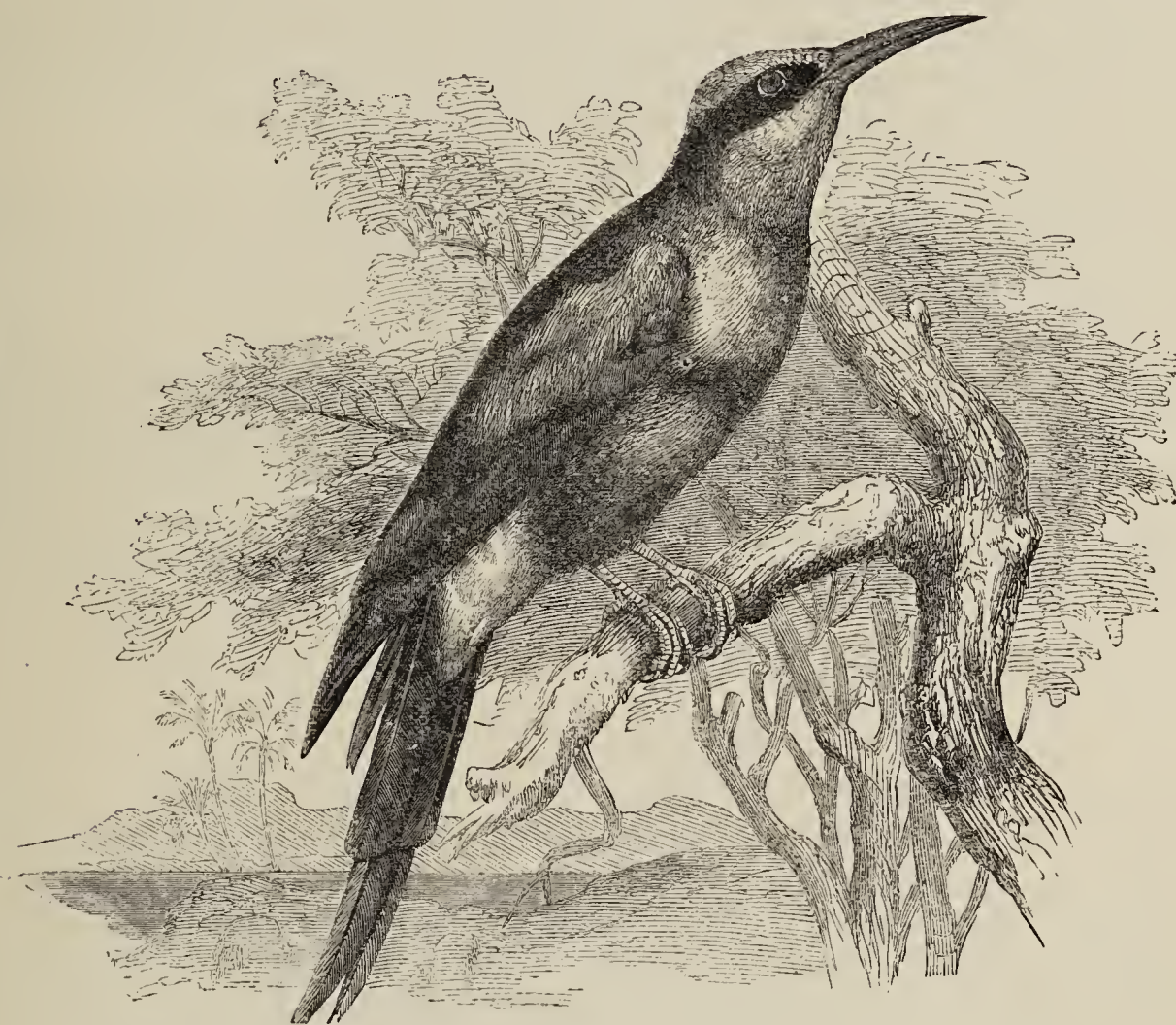
The *Merops apiaster* is an occasional visitor to this country, and somewhat resembles the Swallows in its habits. Like them, it captures prey on the wing. It devours bees and wasps in large quantities, and that without experiencing the least inconvenience from their sting, which it probably gets rid of by frequently pressing the body between its mandibles, until the sting is either extracted or rendered harmless. In the island of Crete these birds are caught by boys, by means of a cicada attached to a pin or fish-hook fastened to a long thread. In many parts of Europe the flesh is esteemed as an article of food. The voice of this species is rich and pleasing.

“I have had the gratification,” says Mr. Thompson, “of seeing the Bee-eater in scenes with which its brilliant plumage was more in harmony than with any in the British Isles. It first excited my admiration when visiting the celebrated grotto of Egeria, near Rome. On approaching the classic spot, several of these birds, in rapid Swift-like flight, swept closely past, uttering their peculiar call, and, with their brilliant colours and graceful form, proved irresistibly attractive. My companions, who, as well as myself, beheld them for the first time, were so greatly struck with the beauty of their plumage, and their bold, sweeping flight, as to term them the presiding deities of the Egerian grotto. Rich as was the spot in historical and poetical associations, it was not less so in pictorial charms. All was in admirable keeping; the picturesque grotto, with its ivy-mantled entrance and gushing spring; the gracefully-reclining, though headless, white marble statue of the nymph; the sides of the grotto covered with the exquisitely-beautiful maiden-hair fern in the richest luxuriance; the wilderness of wild flowers around the exterior attracting the bees on which the Meropses were feeding; and over all the deep blue sky of Rome completing the picture.”

The sting-bearing hymenoptera undoubtedly constitute the favourite food of these resplendent birds, and to obtain them, not only are the hives of the honey-bee put under requisition, but the nests of wasps, hornets, and humble-bees are ruthlessly robbed of their inhabitants; indeed, it has been frequently observed that when the Bee-eaters have been fortunate enough to find a wasp's nest, they establish their head-quarters in its immediate neighbourhood, and, during a few hours' sojourn, generally contrive to snap up its numerous occupants one after another until none are left. Nor do these insects alone suffer from their voracity; grasshoppers, crickets, dragon-flies, gadflies, beetles, flies, and even gnats are by no means unacceptable prey, in spite of the dense, indigestible armour in which some of them are encased.

The nest of the Bee-eater is constructed towards the end of May, the locality selected being generally the sandy or clayey bank of some river, in which it excavates a round hole, from two inches to two inches and a half in diameter, apparently by means of its beak and claws, or perhaps with its claws only; from this external opening the hole extends into the bank in a slightly-inclined direction to a distance of from four to six feet, and terminates in a capacious chamber eight or ten inches long, by four to six inches broad, and three or four inches in height. It is

upon the floor of this chamber that about the month of June the female lays her eggs, which are four or six in number. It is asserted by some writers that in this chamber a nest is constructed with stems of heather and lined with moss; upon this subject we can only say that in none of the holes examined by us was there the slightest trace of any nest-building materials, but in lieu thereof we always found large quantities of the elytra of beetles and of the wings of bees and other insects heaped together as if to form a kind of cushion, so that the young were not quite upon the bare ground. Whether the male assists the female in the process of incubation is as yet undetermined;



THE BEE-WOLF (*Melittotheres nubicus*).

but we can vouch for it that both parents most assiduously wait upon and provide food for their callow progeny.

THE BEE-WOLF.

The BEE-WOLF (*Melittotheres nubicus*) is recognisable from its congeners by its comparatively powerful frame, strong beak, and the great length of its centre tail-feathers. The magnificently-tinted plumage of this beautiful bird is deep red on the back, and rose-pink on the under side; the head, throat, rump, and centre tail-covers are blueish green; the cheek-stripe from the corner of the beak, around the eye to the ear, the tips of the exterior and anterior quills, and the extremities of the centre tail-feathers are black. The eye, like that of all Bee-eaters, is light red, the beak black, and the foot brown. This gorgeous species is thirteen inches and a quarter long, the wing measures five inches and three-quarters, and the outer tail-feathers four inches and one-third; the long centre feathers are seven inches long.

The "Bee-wolves" inhabit the eastern coast of Africa, and are very numerous in some parts. Heuglin tells us that in Cordofania he constantly saw them perching on the backs of cattle, and from thence darting down to seize the grasshoppers disturbed by these involuntary assistants as they wander over the plain.

THE BRIDLED BEE-EATER.

The BRIDLED BEE-EATER (*Coccolarynx frenatus*), a species inhabiting the forests near the Blue River, possesses a delicate, thin beak, a moderate-sized, straight tail, and most glowing and variegated plumage. The upper portions of the body are green, the under side is reddish brown; the brow green and blue intermixed; the throat scarlet; the belly, rump, and under tail-covers are bright blue; the black cheek-stripe, which passes across the eye, is bordered with blue; the eye is bright red, and the beak and foot black. The length of the body is eight inches; the wing measures three inches and one-third, and the tail three inches and a half.

This elegant little bird is very numerous in Central Africa, where it is usually met with in large parties, which rarely fly to any distance above the tree-tops in pursuit of their insect fare, and seize their prey more after the manner of the Flycatchers than of the Swallows. According to our own observations, these birds appear to remain for months together in the vicinity of their settlements of nests. During the Christmas of 1850, whilst anchored in the Blue River, we found at least sixty of the holes employed as nests by this species excavated in a clay bank on the shore; the whole number occupying a space not exceeding thirty-six square feet, and so close together that the entrances were not more than five or six inches apart. The passages to the nest-holes were about an inch and a half in diameter, and from three to four feet deep, terminating in a chamber from six to eight inches long, by four or six broad, and two and a half to three inches high. We found neither building materials nor eggs in these holes, although the birds were constantly creeping in and out of them.

THE SWALLOW BEE-EATER.

The SWALLOW BEE-EATER (*Melittophagus hirundinaceus*), another species inhabiting Africa, differs from the birds above described in the formation of its very deeply forked tail. The mantle is glossy yellowish green, the lower part of the back and tail being of a somewhat deeper shade; the under side is light green; the throat saffron yellow, and divided from the breast by a line of rich ultramarine blue; the vent and a line that passes from the nostrils over the eyes are deep blue; the cheek-stripes are black. The body of this species is eight inches and a quarter long; the wing measures three inches and a half, and the tail four inches and one-sixth. Le Vaillant, who discovered this beautiful bird in Southern Africa, tells us that it lives in pairs till after the period of incubation, when old and young associate in small parties, previous to the season of migration; they then assemble in very large flocks. The nest resembles those of other Bee-eaters. The eggs, six or seven in number, have a blueish-white shell. We also learn from Vaillant that this brilliant creature exhales a very agreeable odour, resembling the perfume of a fragrant flower.

THE AUSTRALIAN BEE-EATER.

The AUSTRALIAN BEE-EATER (*Cosmæerops ornatus*) has the back, a line over the eye, and the wing-coverts brownish green; the crown of the head and the nape orange; the wings orange-brown, shading into green at the extremity of the primaries, and tipped with black; the lower part of the back, the rump, and upper tail-covers are cerulean blue, and the tail black, most of its feathers edged with blue; the bridle and a line beneath and behind the eye and ear-coverts are velvety black, beneath this is a line of light blue; the throat is rich yellow, shading into orange at its sides; below

the yellow is a broad band of deep black, passing into green on the lower part of the belly ; the under tail-coverts are light blue ; the eye is brownish red, the beak black, and the leg and foot mealy greenish grey.

The Australian Bee-eater, according to Gould, arrives in New South Wales in August, and departs north in March, during which interval it breeds and rears its young. "Its favourite resorts," says Gould, "are the open, arid, and thinly-timbered forests during the day, and in the evening the banks and sides of rivers, where numbers may be frequently seen in company. It almost invariably selects a dead or leafless branch whereon to perch, and from which it darts forth to capture passing insects, after the manner of the Kingfishers, to which it also assimilates in the upright position it assumes while perched. Its flight somewhat resembles that of the Artami ; and though it is capable of being sustained for a lengthened time, the bird more frequently prefers short excursions, and returns to the branch it left. The entrance to the breeding-hole, which is made in the sandy banks of a river, is about the size of a mouse's hole, and continued for a yard in depth. At the end is an excavation of sufficient size for the reception of the parent and the deposition on the sand of four or five beautiful white eggs. The food of this species consists of various insects, principally coleoptera and neuroptera."

The NOCTURNAL BEE-EATERS (*Nyctiornis*), a group of Indian Bee-eaters, are recognisable by their strong, curved, and moderately-long beak, almost straight and medium-sized wing, in which the fourth quill exceeds the rest in length. The rich, soft plumage takes the form of very peculiar stiff feathers in the region of the throat and breast.

THE SANGROK.

The SANGROK (*Nyctiornis Athertonii*) is bright green on the mantle, and of a creamy yellow on the under side ; the feathers on the crown of the head and chin, and the edges of the dark blueish green neck-feathers are light blueish green ; the eye is deep yellow ; the beak lead grey, tipped with black ; and the feet deep green. This bird is fourteen inches long, and eighteen broad ; the wing measures five inches and a half, and the tail six inches.

We learn from Hodgson and Jerdon that the Sangrok occupies the extensive forests of India to an altitude of three or four thousand feet above the sea, and that it leads a solitary life among the trees, from and around the branches of which it obtains the bees, wasps, beetles, and grasshoppers that constitute its principal food. The cry of this species is loud and harsh. According to the natives its eggs are deposited in holes of trees.

The ROLLERS (*Coraci*) are a race of tolerably large birds, for the most part remarkable on account of the variety of their colours, and the splendour of their plumage. All of them belong to the Eastern Hemisphere. As the leading features whereby this group is distinguished, we may enumerate their moderate-sized, or moderately long beak, which is strong and nearly straight, somewhat broad at its base, but compressed towards the tip, sharp-cutting at the edges, and bent down at the point ; the legs are short and feeble, and the toes short. The wings are of moderate length, or long and tolerably broad. The tail is of medium length, sometimes truncate at its extremity, sometimes slightly rounded, and sometimes forked ; occasionally, moreover, the two outer feathers are much longer than the rest. The plumage is somewhat harsh and rough, and the shafts of the feathers stiff. The predominant colours are green, blue, cinnamon-brown, and claret-red. The sexes differ but little, and the young very much resemble their parents.

These birds generally inhabit dry, flat country, and are met with extensively throughout Europe, Asia, and Africa, but are scarce in Australia. Their usual residence is some solitary tree or high rock from which they can command an extensive field of vision, and in the holes and clefts of which they can build their nests. In such places they may generally be seen on the look-out for insects, which they catch and devour much in the same way as the Bee-eaters; at times they will dart down upon some poor mouse that happens to approach them too nearly, and occasionally they will snap up a lizard or other small game of that description, and will plunder a bird's nest in order to devour



THE AUSTRALIAN BEE-EATER (*Cosmæerops ornatus*).

the young; but although they thus generally live on animal food, at certain seasons they have no objection to a vegetable diet, and will eat fruit. The flesh of some species is palatable, and they are consequently much sought after in some countries, either as food or on account of the beauty of their feathers.

THE BLUE ROLLER.

The BLUE ROLLER (*Coracias garrulus*), a species exhibiting the principal characteristics of the above family, has a strong, straight beak of moderate size, broad at its base, slightly curved at the culmen, and hooked at its tip; the tarsus is shorter than the middle toe, the second wing-quill is longer than the rest, and the tail straight at its extremity. A brilliant metallic green predominates in the magnificently-coloured plumage; the back is bright cinnamon-brown, the brow and chin are whitish, the quills are indigo blue above and ultramarine blue beneath, the feathers on the small

wing-covers and wings are deep bright blue, the exterior tail-feathers light blue, the rest blueish black, with a light blue outer web. The centre feathers are blueish or greyish green. The eye is brown, the beak black, and the foot dirty yellow. The young are greyish green on the top of the head, nape, and under side, and dull cinnamon-brown on the back; their tail is light blueish green. This species is from twelve to thirteen inches long, and from twenty-seven to twenty-eight broad; the wing measures seven inches and three-quarters, and the tail five inches.

The Blue Roller inhabits the whole of Europe as far north as Scandinavia, and visits the northern half of the continent of Africa, as also many parts of India during its migrations. In our



THE BLUE ROLLER (*Coracias garrulus*).

own country it seems studiously to avoid the vicinity of man; but in more southern regions it is less shy, and consequently more easily made the subject of observation. In its disposition it is exceedingly restless and flighty, and when not restricted, as it is during the brooding season, to a particular locality, it may be seen flying all over the district, sweeping all day long from one tree to another, or perching upon the extremity of some withered bough, or peering out from the very top of a dead tree watching for the approach of prey. In cloudy weather it seems morose and inactive; but during the sunshine it may be seen disporting itself in the air as though in play, ranging round and round, and performing a variety of strange evolutions. Sometimes, for example, it will rise to a considerable height, and then suddenly tumble head over heels down towards the ground, whence it again mounts with toilsome efforts, or, with pigeon-like flight, urges itself forward by rapidly-repeated strokes of its wings, and as it thus moves about with apparently aimless haste,

presents a peculiarity of manner that there is no possibility of mistaking. When in a tree, it does not hop about among the branches, but conducts itself in the same way as many other tenuirostral species, always assisting its movements from one bough to another by the help of its wings. It can scarcely be said ever to come upon the ground, but sometimes flies so close to the earth that it might easily be supposed to be running over its surface. Unlike the Bee-eaters, these birds are very quarrelsome and unsociable, biting at any intruder, even of their own species, and quite incapable of living peaceably with any other kind. Their voice corresponds well with their German name of *Rake*, consisting of a loud, rattling repetition of "raker, raker, raker"—a cry occasionally exchanged for "rak, rak, jack."

These birds live principally upon insects, all sorts of which they greedily devour; sometimes they will have no objection to a mouse, or a bird, a lizard, a frog, or any other small animal. It is a very common opinion that the Blue Roller can dispense with water altogether, that it neither drinks it nor uses it for a bath; and truly any one who has seen it, as we have done, in the midst of the arid plains in which it seems to be most at home, will scarcely feel inclined to doubt the possibility of the statement being well founded.

The usual nesting-place of this Roller is in some hollow tree, and its nest is usually constructed of roots and straw, lined with hair and feathers; in the south of Europe it not unfrequently builds in rifts and chinks in old walls, or even excavates for itself a hole in the ground, much in the same way as the Bee-eaters. The brood consists of from four to six white and polished eggs. Both sexes co-operate in the work of incubation, and so assiduously do they maintain their post when sitting, that they may be sometimes caught with the hand while upon the nest. The young are fed upon insects and grubs. They soon learn to fly, but remain with their parents, and accompany them in their winter migrations.

The DOLLAR BIRDS (*Eurystomus*) are recognisable by their short, flat beak, which is broad at its sides, rounded at the culmen, and very decidedly hooked; the second wing-quill is the longest; the tail is either short and straight or slightly rounded; the structure of the foot and coloration of the plumage resemble that of the group above described.

THE AUSTRALIAN DOLLAR BIRD.

The AUSTRALIAN DOLLAR BIRD (*Eurystomus Australis*, or *Pacificus*) is of a deep brown on the head and neck, the rest of the mantle being sea-green; the region of the cheek is black; the feathers on the throat a bright green; the secondary quills, roots of the outer web of the primaries, and the outer web of the roots of the tail-feathers, are bright blue; and there is a blueish-white spot on the centre of the wing. The eye is dark brown; the eyelids, beak, and legs are red. The length of this species is ten inches; the wing measures six inches and three-quarters, and the tail three inches and a half.

According to Gould, the Dollar Bird appears in New South Wales in the spring, and again retires north as soon as the young are fully grown. On dull days, or at early morning, and in the evening, it is to be seen most actively employed in pursuit of the beetles and other insects on which it subsists.

"When engaged in the capture of insects," says Gould, "it usually perches upon the dead, upright branch of a tree growing beside and overhanging water, where it sits very erect, staring all around until a passing insect attracts its notice, when it suddenly darts off, secures its victim, and returns to the same branch; at other times it may constantly be seen on the wing, mostly in

pairs, flying just above the tops of the trees, diving and rising again with rapid turns in the most beautiful manner. During flight, which, when performed at a considerable elevation, is laboured and heavy, the white spot in the centre of each wing, then widely expanded, shows very distinctly; and hence the name of Dollar Bird bestowed on it by the colonists. It is very noisy, particularly in dull weather, when it often emits its peculiar chattering note during flight. The breeding season continues from September to December; the three or four pearl-white eggs are deposited in a tree."

THE ORIENTAL DOLLAR BIRD.

The ORIENTAL DOLLAR BIRD (*Eurystomus Orientalis*), a nearly-allied Indian species, we are told, passes a great portion of its time in flying from place to place, and hangs, Woodpecker-like, from the trunks of trees whilst in search of the grubs and insects on which it subsists.

The SAW-BILL ROLLERS (*Prionites*), though in many respects resembling the Blue Rollers, differ from that bird in their superior length of tail and height of tarsus, as well as in the saw-like edges with which the margin of the beak is furnished; the latter is slightly curved, compressed at its sides, and without a hook at its tip; the base of the beak is overgrown with stiff, bristle-like feathers. The wings, in which the fourth or fifth quills are the longest, are short and rounded; the strong, wedge-shaped tail is composed sometimes of ten, sometimes of twelve feathers, placed in pairs of equal length, of which the centre pair are the longest. The plumage is full, soft, and consists of large feathers, thickly covered with down at the roots.

The Saw-bill Rollers occupy the woods and forests of South America, and lead a retired life, either alone or in pairs, and far from the abode of man; their cry, which resembles a note from a flute, is most frequently heard in the morning and evening. Insects afford their principal means of subsistence, and these they obtain in a great measure from the surface of the ground.

THE MOT-MOT.

The MOT-MOT (*Prionites momota*) is of an olive-green on the back, wing-covers, and legs; the neck, throat, breast, and belly are reddish yellow; the top of the head, cheeks, and bridles black; and the brow and a narrow collar at the back of the head of a brilliant blueish green; the quills are blackish, the secondaries sky-blue on the outer web. The tail, which is composed of twelve feathers, is green above and black beneath; the eye is reddish brown, the beak black, and the foot horn-grey. This species is nineteen inches long; the wing measures six and a half inches, and the tail eleven inches.

According to Burmeister, the Mot-mot inhabits the wooded districts in Northern Brazil; and Schomburghk, who found them very numerous in Guiana, had there an opportunity of observing their habits and mode of life. "Shortly before sunrise," says the last-named writer, "the plaintive and melancholy 'hutu, hutu' of the Saw-billed Roller may be heard among the foliage on the outskirts of the forest, announcing the approach of morning. This remarkable bird seems to avoid all well-lighted places; and, although by no means shy, never appears beyond the outskirts of the forest. It will even allow an intruder to come quite close to its perching-place before it flies off to another twig, where, immediately that it has perched itself, it again begins its well-known notes 'hutu, hutu,' accompanying each syllable with a stroke of its tail somewhat after the manner of our own Wagtail."

When about to construct its nest, the Mot-mot selects a round or oval depression in the side of some hillock, or other elevated spot; and although the male and female regularly relieve each other at short intervals, the monotonous duty of incubation seems by no means agreeable to either;

so that after sitting for three or four minutes quietly upon the eggs they begin to turn themselves round, and it is supposed to be by the constant repetition of this movement in a circle that the feathers of their tail become in time quite spoiled and worn away. As to their eggs, Schomburghk gives us no information whatever, nor do we find anything recorded concerning them in the works of other naturalists.



THE MOT-MOT (*Prionites momota*)

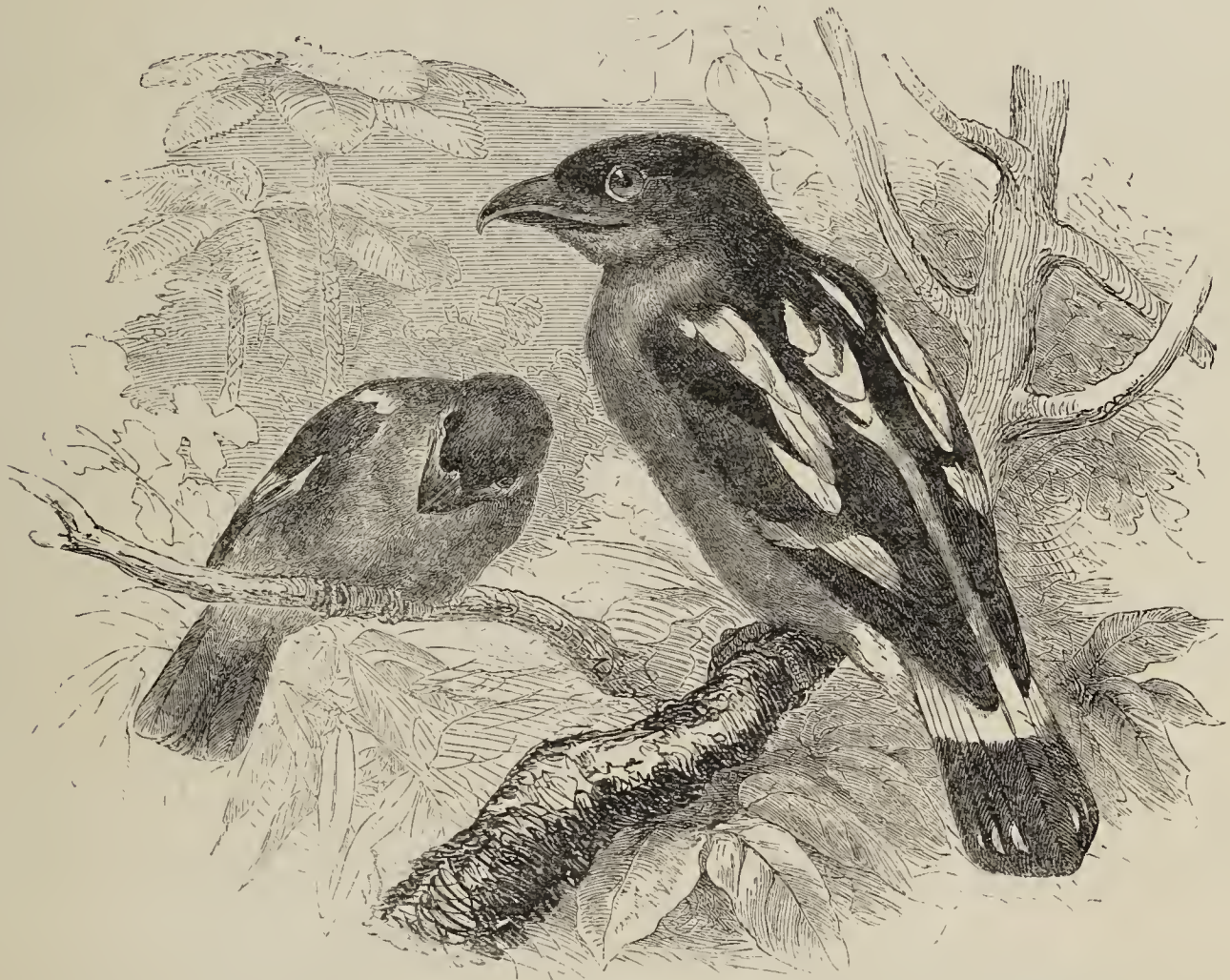
The BROAD-THROATS (*Eurylaimus*) are small, compact birds, with short, broad beaks, powerful feet, moderate-sized wings, and short or rather long tail. The beak, which is shorter than the head, is broad at its base, slender at the tip, and hooked at its extremity; the gape extends as far as the eyes; the moderate-sized foot has the tarsus a trifle longer than the centre toe, which latter is united with the inner as far as the first joint; the wing, in which the third or fourth quill is the longest, is short and rounded; the tail is usually either rounded or graduated; in some species, however, it is slightly incised; the plumage is of brilliant hues, and the sexes almost alike in colour and markings. These birds inhabit India and the Malay Islands, where they haunt the innermost recesses of deep, dark forests, and carefully avoid the habitations of man.

THE SUMATRAN TROWEL-BEAK.

The SUMATRAN TROWEL-BEAK (*Corydon Sumatranus*), a species of the above family inhabiting Sumatra and Borneo, represents a group recognisable by their compact and falcon-like body; short, broad beak, the upper mandible of which almost entirely encloses the lower one; and also by their bare, short, strong feet, armed with long toes; short rounded wings, in which the third or fourth quill exceeds the rest in length; and moderate-sized tail, formed of twelve rounded feathers. The dusky plumage, which is soft and thick, is replaced in

the region of the beak by a few short bristles; its colour is principally of a pale black; the entire

throat pale brownish yellow ; the centre of the back bright red ; the wings are black, with a few white spots ; the tail-feathers pale black, the centre pair of uniform hue, the rest marked with white towards the tip. The eye is brown, the beak and a bare place round the eye are bright red ; the foot is blackish brown. This species is nine inches and a half long ; the wing measures four, and the tail three inches and a half ; the beak is one inch long, and one inch and a quarter broad at its base. We are entirely without particulars as to the life and habits of this bird, except that it frequents moist and shady woods in the vicinity of water, and associates in small parties.



THE JAVA BROAD-THROAT (*Eurylaimus Javanicus*).

The TRUE BROAD-THROATS (*Eurylaimus*) are recognisable from the above group by the formation of their beak, which is longer and flatter than that of the last-mentioned species.

THE JAVA BROAD-THROAT.

The JAVA BROAD-THROAT (*Eurylaimus Javanicus*) is blackish brown on the upper back, lemon-yellow on its lower portion, and greyish crimson on the under side ; a stripe between the shoulders, another on the shoulder-covers, and several patches on the outer webs of the quills are lemon-yellow ; the tip of the tail is enlivened by a white line ; the beak is glossy black, except at the culmen and margins, which are greyish white ; the first is yellowish brown. This bird is eight inches and a half long ; the wing measures three inches and five-sixths, and the tail two inches and one-third.

According to Raffles, the Java Broad-throat frequents the banks of rivers and the vicinity of water, in search of worms and insects. It makes its nest on a branch overhanging the surface of the water. Helfer informs us that a very similar species occupies the tree-tops in flocks of from thirty to

forty birds ; and that they are either so fearless or so stupid as to remain on their perch regardless of the shots that are laying their companions dead.

THE RAYA.

The RAYA (*Psarisomus Dalhousiæ*), a representative of the above birds, is recognisable by its moderate-sized, broad beak, which is decidedly curved at its culmen and hooked at its tip. The short wing is slightly rounded, the tail long and graduated, and the plumage brightly tinted ; the mantle is bright blue ; the top of the head, except a small blue spot, quite black ; the brow, cheek-stripes, a small tuft near the ear, the throat, and a narrow band at the nape are saffron-yellow ; the entire under side is of a parrot green ; the blackish-brown quills have a blue outer web ; the tail-feathers are blue above and glossy blackish brown beneath ; the eyes brown, and beak green, with a black culmen ; the foot is dusky greenish yellow. The length of this species is fourteen inches ; the wing measures four inches, and the tail five inches and a half.

This beautiful bird inhabits India, and, as Jerdon tells us, is met with in the forests of the Himalayas to a height of 6,000 feet above the sea ; those he found were engaged in seeking their insect prey upon the trees, either alone or in pairs. The nest, according to the same author, is a large structure, loosely framed of grass and moss. The eggs, two in number, have a white shell.

The TODIES (*Todi*), a group of American birds, apparently representing the Broadthroats, are remarkable for the very peculiar formation of their beak ; and on this account much diversity of opinion has arisen as to the place that should properly be assigned them. All the species with which we are acquainted are small, delicately-built birds, possessing moderate-sized and straight beaks, with both mandibles so flatly compressed that they may literally be described as two thin plates ; the margins of the bill are finely incised, and the gape extends as far back as the eyes ; the tarsus is slender, and scarcely longer than the middle toe ; the toes are unusually long and thin, armed with short, delicate, but very sharp hooked claws ; the fourth, fifth, and sixth quills in the short, rounded wings exceed the rest in length ; the tail, of moderate length, is broad, and slightly incised. The plumage, which consists of soft, compact feathers, is replaced by bristles in the region of the beak ; the tongue, except at its fleshy root, resembles a horny plate, and is as transparent as the barrel of a quill.

THE TODY, OR GREEN FLATBILL.

The TODY, or GREEN FLATBILL (*Todus viridis*), is of a blueish green on the back, and greyish white on the under side. The throat and upper breast are bright rose red, and the belly pale yellow ; the quills are greyish green ; the centre tail-feathers green, and those at the exterior grey ; the eye is pale grey, the beak reddish horn-grey above, and bright scarlet beneath ; the foot flesh-pink or brownish red. This species is four inches and a quarter long, and six and a half broad ; the wing measures one inch and four-fifths, and the tail one inch and a half. The sexes closely resemble each other in the coloration of their plumage.

“In all parts of Jamaica,” says Gosse, “that I have visited, the Tody is a very common bird. On the summit of Bluefields Mountain, about 3,000 feet above the level of the sea, and particularly where the deserted provision-grounds are overgrown with an almost impenetrable thicket of joint-wood, it is especially abundant. Always conspicuous, from its bright, grass-green coat, and crimson velvet gorget, it is still a very tame bird ; yet this seems rather the tameness of indifference than of confidence : it will allow a person to approach very near, and, if disturbed, alight on another twig a few yards distant. We have often captured specimens with an insect-net, and struck them down with a switch ; it is not uncommon for the little boys to creep up behind one, and actually to clap

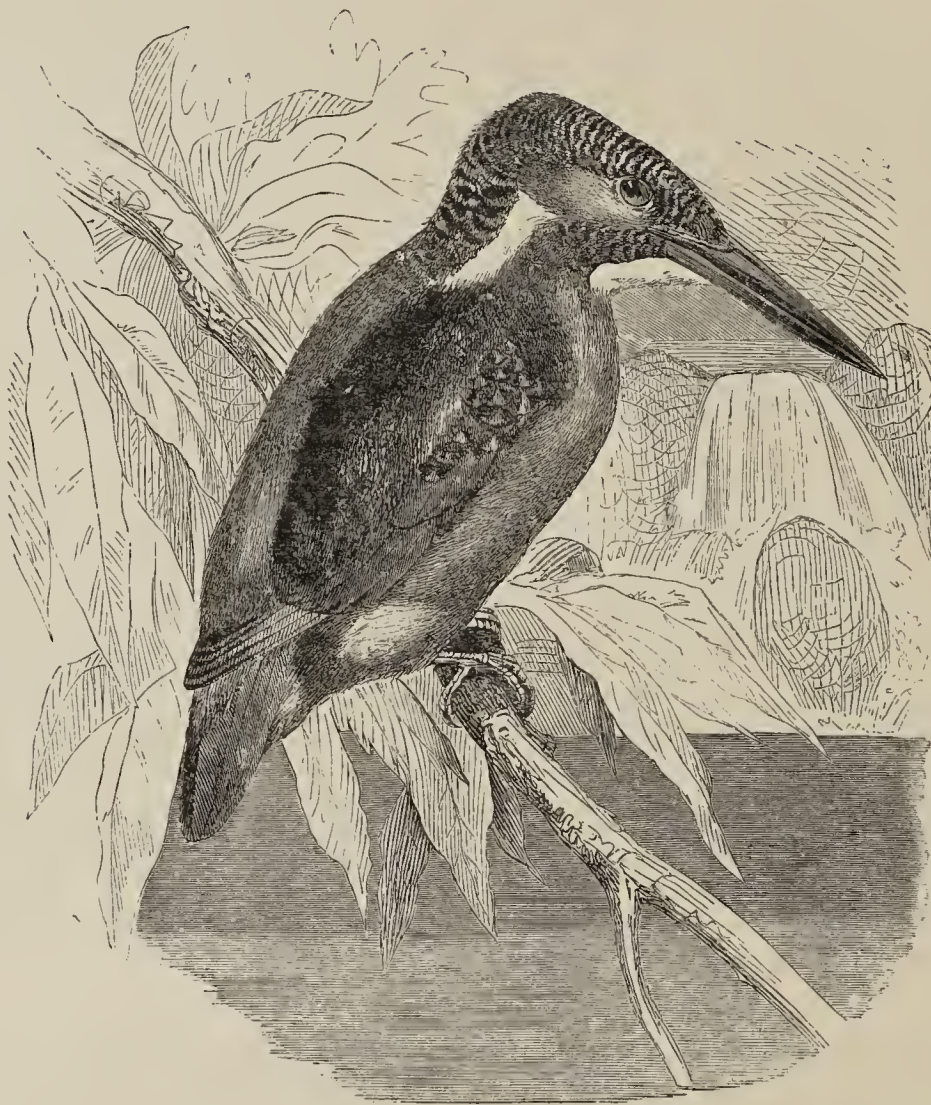
the hand over it as it sits, and thus secure it. It is a general favourite, and has received a familiar name—that of Robin Redbreast. There is little resemblance, however, between the European Robin and its West Indian namesake. I have never seen the Tody on the ground; but it hops about the twigs of low trees, searching for minute insects, occasionally uttering a querulous, sibilant note. But more commonly it is seen sitting patiently on a twig, with the head drawn in, the beak pointing upwards, and the lower plumage puffed out, when it appears much larger than it really is. It certainly has an air of stupidity when thus seen; but this abstraction is more apparent than real. If we watch it we shall see that the odd-looking grey eyes are glancing hither and thither, and that ever and anon the bird sallies out upon a short, feeble flight, snaps at something in the air, and returns to his twig to swallow it. I have never seen the Tody eat vegetable food; but I have occasionally found in its stomach, among minute coleopterous and hymenopterous insects, a few small seeds. One of these birds, which I kept in a cage, would snatch worms from me with impudent audacity, and then beat them violently against the perch or sides of the cage, to divide before he swallowed them. One captured in April, on being turned into a room, began immediately to catch flies and other minute insects that flitted about. At this employment he continued incessantly and most successfully all that evening and all the next day, from earliest dawn till dark. He would sit on the edge of the table, on shelves, or on the floor, ever glancing about, now and then flitting up into the air, when the snap of his beak announced a capture, and he returned to his station to eat it; he would peep into the lowest and darkest corners, even under the tables, for the little globose, long-legged spiders, which he would drag from their webs and swallow. He sought these also about the ceilings and walls. I have said that he continued at this employment all day without intermission, and I judge that on the average he made a capture per minute. We may thus form some idea of the immense number of insects destroyed by these and similar birds. Water in a basin was in the room, but I did not see him drink. Though so actively engaged in his own occupation, he cared nothing for the presence of man; he sometimes alighted voluntarily on our heads, shoulders, or fingers, and when sitting would permit me at any time to put my hand over him and take him up, though when in the hand he would struggle to get out. He seemed likely to thrive; but incautiously settling in front of a dove-cage, a surly bald-pate poked his head through the wires, and aimed a blow at the head of the unoffending Tody. She did not appear to mind it at first, but an hour afterwards shivered and died."

"The Green Tody," says Mr. Hill, "is a bird of peculiar structure and habits; he is exclusively an insect-feeder, and burrows in the earth to breed. The subterranean nest is made wherever there is mould easy of excavation; ravines and gullies, whose banks are earthy, and where the water passes rapidly from the surface-soil, are generally selected. The excavation is made by the beak and claws. It is a winding gallery, rounded at the bottom, and terminating in a sufficiently wide lodging, lined with pliant fibres, dry moss, and cotton, placed with much attention to arrangement. Four or five grey, brown-spotted eggs are laid, and the young are fed within the cave till they are full-fledged."

The KINGFISHERS (*Alcedines*) principally frequent the warmer latitudes. The members of this group possess a powerful body, large head, and short or moderate-sized wings and tail, with a very long, straight, and powerful beak, pointed at its extremity; the small foot is furnished with either three or four toes. The plumage is of most brilliant hues, and varies but little in the sexes, or with the age of the bird.

All the various species of Kingfishers prefer the vicinity of water; and, where fish is to be found, venture to a very considerable altitude when following mountain-streams. Like all such members

of the feathered creation as subsist by fishing, they are quiet, indolent, and wary in their habits, seeking their prey either alone or, at most, in pairs. As regards their powers of locomotion, they have little to distinguish them; it is true, they possess a certain skill in diving and swimming, but on the ground or in the air their department is extremely clumsy. Of their senses, sight and hearing appear to be highly developed; but, with these exceptions, we must pronounce these birds to hold a very low place in the scale of intelligence, and to exhibit but one attractive quality—that of warm attachment to their eggs and young. Fish, insects, and crabs constitute their principal



THE EUROPEAN KINGFISHER (*Alcedo ispida*).

means of subsistence, and these are principally obtained by diving. The numerous eggs laid by the members of this group are deposited in a hole excavated in the ground, the extreme end of which forms the actual nest.

THE EUROPEAN KINGFISHER.

The EUROPEAN KINGFISHER (*Alcedo ispida*) is recognisable by its long, thin, straight, and powerful beak, which is much compressed at its tip. The foot is small; the centre of the three front toes is connected with the external toe as far as the second, and with the short inner toe to the first joint; the hind toe is very small; the third quill in the short, blunt wing exceeds the rest in length; the tail is formed of twelve small feathers. The thick, compact plumage is very brilliant, with a metallic gloss above, and a silky gloss on the under side. The feathers on the head are prolonged into a crest. As it would be impossible to mistake the European Kingfisher for any other bird, it will

suffice to say that the upper portions of the body are greenish blue, and the lower yellowish brown ; the eye is deep brown, the beak bright red, and the foot cinnabar-red. The length of this bird is six inches and a half, the breadth ten inches and a half ; the wing measures two inches and two-thirds ; the length of tail one inch and a half.

This Kingfisher, the only European representative of the above group, is one of the most beautiful of our British birds, and its appearance as it dashes along in the sunshine strikingly brilliant. It is an inhabitant of all parts of Europe, except the extreme north, and is also widely spread over Asia and Africa. This species is always found in the vicinity of water, over which it may be seen shooting along like a little meteor. Its food consists not only of small fishes, but also of aquatic insects and leeches. The appetite of the Kingfisher is voracious, and his manners shy and retiring. Dwelling near sequestered brooks and rivers, he sits for hours together motionless and solitary on some bough overhanging the stream, patiently watching the movements of the smaller fishes which constitute his food, waiting for a favourable moment to dart with the velocity of an arrow upon the first that comes near enough to the surface, and seldom failing in his aim. He returns with it to his former station, on some large stone or branch, where he kills his captive by shifting its position in his bill, so as to grasp it firmly near the tail, and striking its head smartly against the object on which he rests ; he then reverses its position and swallows it head foremost ; the indigestible parts are afterwards ejected in a manner analogous to that of Owls and other birds of prey. The Kingfisher, however, does not confine himself to this mode of watching in motionless solitude, but should the stream be broad, or no favourable station for espionage present itself, he may be seen poising himself over it at an altitude of ten or fifteen feet, scrutinising the element below for his food, and then plunging upon it with a velocity which often carries him considerably below the surface. For these habits his muscular, wedge-shaped body, increasing gradually from a long, pointed bill, and his sleek plumage, which, whilst it passes freely through the water, is impervious to wet, seem especially to adapt him. His wings are short, but powerful ; hence his flight is smooth, even, and exceedingly rapid. Silent, except during the pairing and breeding season, when he occasionally utters a sharp, piercing cry, indicative, perhaps, of attachment, and equally solitary and unsocial in his habits, the Kingfisher dwells alone ; seldom consorting with others, or even with his mate, except during the rearing of the young, when both sexes discharge with assiduity the duty of procuring requisite supplies of food. The places selected for incubation are steep and secluded banks, overhanging ponds or rivers, generally at a considerable distance above the surface of the water, and extending two or three feet into the bank. The female, without making a nest, lays five or six eggs, of a beautiful pinky white. As soon as the young are hatched, the parent birds may be seen incessantly passing to and from the hole with food, the ejected remains of which in a short time accumulate around the callow brood. The young do not leave the hole until fully fledged, when, seated on some neighbouring branch, they may be known by their clamorous twitterings as they greet their parents, from whom they impatiently expect supplies of food. They assume at an early age a plumage nearly resembling the adult. The Kingfishers appear to possess habits of partial migration ; or, at least in our island, they wander from the interior of the country along the rivers to the coast, and in the autumnal and wintry months frequent the mouths of small rivulets and dykes near the sea.

The PURPLE KINGFISHERS (*Ceyx*), a group inhabiting India, the Malay and Philippine Islands, and New Guinea, are without the inner toe possessed by the European Kingfisher above described. These birds have hitherto been grouped with the Halcyones on account of the broad base of their beak ; but the shortness of their wings and tail, and their general habits, fully justify their introduction in this place.

THE PURPLE KINGFISHER.

The PURPLE KINGFISHER (*Ceyx tridactyla*), one of the most remarkable members of this family, is of a bright orange, gleaming with peach-colour on the back, and shading from rust-red into chestnut-brown on the neck and sides of breast; the rest of the under side is saffron-yellow. The large wing-covers are deep black, the shoulders and exterior borders of the wings chestnut-brown, the quills blackish brown, with a rust-red edge to the inner web; the tail-feathers are rust-red. This species is five inches long and eight broad; the wing measures two inches and a quarter, and the tail three-quarters of an inch. This beautiful bird is met with over the whole extent of India and Ceylon, but is nowhere numerous. Fish and some of the smaller inhabitants of the water constitute its usual food.

The GREY KINGFISHERS (*Ceryle*) exhibit, in an eminent degree, the admirable skill with which their bodies have been adapted to the situation they are destined to occupy in the great scheme of creation. Although resembling the True Kingfishers in many particulars, their wings are considerably longer and more pointed than in those birds, and far more available as instruments of locomotion; the long, straight beak is compressed at its sides, and pointed at its tip; the almost lustreless plumage is of comparatively sombre hue, and differs more or less in the sexes. Most of the numerous members of this group inhabit America; some few are met with in Asia and Africa, while Europeans may lay claim to one species that may now be regarded as naturalised, on account of the frequency of its visits to our continent.

THE GREY KINGFISHER.

The GREY KINGFISHER (*Ceryle rudis*) is chequered blue and white on the mantle, with a white under side, relieved by two black lines upon the breast, and dark spots upon the sides; the top of the head and the cheek-stripes are black, the eyebrows black and white, the white tail-feathers are crossed by a black line near the extremity, the eye and foot are brown, the beak is black. This species is ten inches long and eighteen broad; the wing measures five and the tail three inches. The female has but one black line upon her breast.

The Grey Kingfisher is met with in almost every part of Africa, in Syria, Egypt, Palestine, Persia, and, we believe, in India; in Europe, as far as we can ascertain, it has only been seen in Greece and Dalmatia. Unlike the true Kingfisher, this bird exhibits a most social disposition, and prosecutes its search for food in spots constantly frequented not only by cattle, but by man. The chase after fish is sometimes carried on from the top of a post or projecting branch, sometimes while the bird is hovering over water, into which it plunges headlong at the first appearance of a suitable victim, which is borne off to some favourite perch, and there devoured, after (as is frequently the case) it has been struck repeatedly against the branch or post. When in pursuit of food, the Grey Kingfisher flies over the surface of the water with a Falcon-like motion, rising and sinking rapidly through the air, and varying its movements with equal adroitness and grace. During the daytime it is comparatively quiet, but towards evening begins to disport itself in this manner, accompanying its movements by a loud, shrill, monotonous cry. According to our own experience, the breeding season commences in Egypt about March or April. Tristram informs us that the nests made by this bird in Palestine are placed in settlements formed in the steep banks of rivers. Some which he examined had their entrances not more than four inches above the level of the water; each of these entrance-passages was about three inches and a half deep, and led into the actual nest; a few fish-bones and a little grass had been placed to form a bed, on which the eggs

were deposited. The latter vary both in form and colour; those we saw were oval in shape, and pure white.

The ALCYONS (*Halcyones*) are at once recognisable from the Kingfishers by the superior development of their wings, their greater breadth of beak, and more powerful feet. The plumage is lax and of brilliant hue, and, in some species, rivals that of any member of the feathered creation in gorgeous beauty. Africa, Southern Asia, Australia, and the islands in their vicinity, afford a home to the numerous and varied members of this group; in America and Europe they are unrepresented. All are more or less inhabitants of woodland districts, and but few exhibit a decided preference for the vicinity of water. Unlike the Kingfisher, the Alcyons are active in their habits, and, when winging their way through the air, equal the Bee-eater in agility and grace. But few move with ease upon the ground, or are capable of obtaining their prey by plunging beneath the water; they usually procure the insects, beetles, and grasshoppers on which they mainly subsist by darting down upon them from a chosen lurking-place among the branches of their favourite trees. Some, we are told, will even attack snakes, while others destroy large numbers of other birds' eggs and young. Such as possess sufficient zeal to obtain a few fish or crabs, exhibit but little skill either in swimming or diving after them. The voice of all is loud and peculiar, and, as far as our own observation goes, their intelligence and senses are not highly developed. Their neatly-constructed nest is usually placed in a tree, or hollow in a stone or in the ground. The eggs are pure white and very glossy.

The TREE ALCYONS (*Halcyones*) are recognisable by their long, straight, broad beak, which in some species turns slightly upwards, their short feet, moderate-sized and rounded wing, with its third quill only a trifle longer than the fourth and fifth, and a comparatively short and rounded tail.

THE RED-BREASTED TREE ALCYON.

The RED-BREASTED TREE ALCYON (*Halcyon rufiventris*) is black on the mantle, and reddish brown on the under side; the head, back, and sides of the throat are ash-grey; the lower part of the back, the tail, and a large spot on the wings are of a metallic green; the front of the throat is pure white, the breast dirty white, and the cheek-stripes black. When seen from beneath, the wing is of reddish brown, marked with white, and tipped with black; the under side of the tail is similarly coloured; the eye is brown, the beak and feet red. This species is eight inches and a half long; the wing measures three inches and a half, and the tail two inches and a half.

The *Halcyon rufiventris* is an inhabitant of Western and Central Africa, where, according to our own observations in Eastern Soudan, it principally frequents well-watered and woodland districts, in preference to the scanty growth of brushwood to be found in the vast and arid steppes. The nest usually contains three round, glossy white eggs; these are laid in October or November, and are hatched by the united care of both parents; on the male alone, however, devolves the task of rearing the nestlings.

The WOOD ALCYONS (*Todiramphus*) have the beak still shorter, broader, and more decidedly turned upwards than in the birds last mentioned; the wing is also somewhat larger, and its second quill almost equals the third in length. The various members of this group principally inhabit Australia and the most extensive of the neighbouring islands; whilst in India, although they are occasionally met with, the species are few and comparatively rare.

GREY KINGFISHERS (*Ceryle rudis*).

THE YELLOW-HEADED WOOD ALCYON.

The YELLOW-HEADED WOOD ALCYON (*Todiramphus chlorocephalus*), a species inhabiting Java, is of a metallic green on the back, and white on the under side; the cheek-stripes, which pass behind the neck and unite on the back, are black; a spot on the sides of the brow, and a line on the nape, are both dirty white; the eye is yellowish, the upper mandible entirely black, the lower one yellowish.

THE LAUGHING JACKASS (*Paralcyon gigas*, or *Dacelo gigantea*).

white at its base, with black tip. This species is nine inches long; the wing measures four inches and a half, and the tail two inches and three-quarters.

According to Bernstein, this species is one of the commonest of the birds inhabiting Java; and is to be seen on the banks of every river or streamlet that is not at any great distance from trees, and from a projecting stone or branch patiently spying out the approach of any insect or tiny fish. Its flight is usually accompanied by the repeated utterance of its clear loud cry. The nest consists of a bed of dry leaves and moss placed in a hollow in the ground, protected by an overhanging stone. The three or four eggs have a dull white shell.

THE BLUE ALCYON.

The BLUE ALCYON (*Cyanalcyon Macleayi*), one of the most beautiful birds of Australia, is blackish blue on the head, as far as the nape; the mantle is bright blue; the wings and tail are black, shaded with blue; the entire under side of the roots of the primary and secondary quills, a broad band round the throat, and an oval spot behind the nostrils, are white; the iris is dark brown, the beak black, and the tarsus blackish grey. The female is less brightly coloured than her mate, and has an irregular, broken line of white around her throat. This species is seven inches long; the wing measures six inches and one-sixth, and the tail two and a half inches.

"This beautiful bird," says Gould, "far surpasses any other Australian Kingfisher in the brilliancy of its plumage. Like the other members of the genus to which it belongs, it is rarely if ever seen near water, and evinces so decided a preference for the open forests of the interior of the country that it has obtained the name of the Bush Kingfisher. It is generally dispersed about in pairs, and feeds on small reptiles, insects, and their larvæ. Its usual note is a loud "pee-pee," uttered with considerable rapidity. It incubates in November and December, sometimes forming its nest in the hollow trunks of trees, and at others excavating for itself a hole in the nest of the tree-ants, which present so singular and prominent a feature in the scenery of the country. The nest of these birds is easily discovered, for on the approach of an intruder they at once commence flying about in a very wild manner, uttering a loud, piercing cry of alarm. The eggs, three or four in number, have a pearly white shell, and are round in form."

The GIANT ALCYONS (*Paralcyon*, or *Dacelo*) are readily distinguishable, not only from their size, but by their long flat beak, which is broad and flat at its base, straight at the culmen, compressed at its sides, and slightly hooked at the tip of the projecting upper mandible; the tarsi are short, but powerful, and the toes very long and thick; the wings, in which the second and third quills are of almost equal length, are of moderate size, and blunt; the broad tail is also of medium length. The rich, lax plumage is of comparatively quiet hue.

THE LAUGHING JACKASS, OR SETTLER'S CLOCK.

The LAUGHING JACKASS, OR SETTLER'S CLOCK (*Paralcyon gigas*, or *Dacelo gigantea*), an interesting and very familiar species, inhabiting Australia, is dark brown on the back, and dull yellowish white on the under side; the lower part of the back and wing-covers are of a blueish shade; the tail-covers rust-red, striped with black; the long, pointed feathers on the head have the shafts streaked with brown; the bristle-like ear-feathers are black; the exterior quills are blackish brown, and white at the root; and the tail-feathers rust-red, striped with black, and marked with white at the tips and sides of the inner web. The female is paler in hue, and less decidedly marked upon the head. This bird is from seventeen to eighteen inches long, and more than two feet across the span of the wings; the wing measures eight inches. The tail is seven inches long.

"The *Dacelo gigantea*," says Gould, "is a bird with which every traveller in New South Wales is acquainted, for, independently of its large size, its voice is so extraordinary as to be unlike that of any other living creature. In its disposition it is by no means shy, and when any new objects are presented to its notice—such as a party traversing the bush, or pitching their tent—it becomes very prying and inquisitive, often perching on the dead branch of some neighbouring tree, and watching with the greatest curiosity the kindling of the fire and the preparation of the meal. Its presence, however, owing to the quietude with which it passes through the forest, and the almost noiseless manner in which it settles, is seldom detected, until it emits its extraordinary gurgling;

laughing note, which has obtained for it the name of the 'Laughing Jackass.'" Captain Sturt describes this strange cry as "resembling a chorus of wild spirits." Gould states that this species seldom or never drinks, and is therefore as much at home on arid plains as near the coast or river-banks. "Its food, which is of a mixed character," continues the same writer, "consists of animal substances. Reptiles, insects, and crabs, however, appear to be its favourite diet; it devours lizards with avidity, and it is not uncommon to see it bearing off a snake in its bill, to be eaten at leisure. Unlike most other species, the *Dacelo gigantea* frequents every variety of situation; the luxuriant brushes extending along the coast, the more thinly-timbered forest, the belts of trees studding the parched plains, and the brushwood of the higher ranges being alike favoured by its presence. Over all these localities it is dispersed, but is nowhere numerous. It breeds during the months of August and September, and generally selects a hole in a large gum-tree for the purpose; making no nest, but depositing its beautiful pearl-white eggs on the decomposed wood at the bottom of the hole. The parent bird defends its young with the greatest courage and daring, darting down upon any intruder who may attempt to ascend the tree, and inflicting severe and even dangerous wounds with its pointed bill. It bears confinement remarkably well, and is one of the most amusing birds for an aviary with which I am acquainted."

The PARADISE ALCYONS (*Tanysiptera*) are recognisable from the above groups by the unusual length of the centre tail-feathers; the beak, somewhat longer than the head, is conical in form, its upper mandible almost straight, while the lower one curves slightly upwards. In the wing, the fourth quill exceeds the rest in length; the long and graduated tail varies considerably in its formation.

THE TRUE PARADISE ALCYON.

The TRUE PARADISE ALCYON (*Tanysiptera sylvia*), one of the most refulgent members of this group, is bright blue on the crown of the head, wings, and two outer tail-feathers; the cheek, back of the throat, and mantle are black; and a triangular patch between the shoulders, the rump, and the two centre flowing tail-feathers pure white. The entire under side is brownish red; the beak and foot are bright red. The body measures ten inches; the wing two inches and two-thirds, and the tail two inches and three-quarters.

Gould tells us that this beautiful bird, which has at present only been met with at Cape York, on the northern coast of Australia, never alights upon the ground, but is usually seen perched upon a bare twig or parasitical plant, from whence it darts upon its insect prey, always returning at once to its perch. Its flight is remarkably rapid. The cry of this species, which resembles the syllables "wee-wee-wee," is usually uttered when the bird is stationary. Owing to its extreme timidity, the *Tanysiptera sylvia* is extremely difficult to obtain; indeed, the sportsman may follow it for an hour at a time without the chance of a fair shot. According to the natives, the three white eggs laid by the female are deposited in ant-hills.

Two other nearly allied species, the *Tanysiptera dea* and the *Tanysiptera nymphe*, inhabit New Guinea, the Moluccas, and Philippine Islands.

The SAW-BEAKED ALCYONS (*Syma*) have a long, thin beak, broad at its base, and compressed at its sides, furnished down two-thirds of its length with numerous strong teeth-like appendages; the upper mandible projects beyond the lower portion of the bill, and terminates in a sharp, slender tip; in the short wing the third and fourth quills are of equal length, and longer than the rest; the tail is of medium size, and very decidedly rounded.

THE PODITTI.

The PODITTI (*Syma flavirostris*), one of the two species of Saw-beaked Alcyons with which we are acquainted, as inhabiting Australia and New Guinea, is of a brownish red on the top of the head, nape, ear-covers, and sides of throat; the back and wings are dull green, the rump and tail greenish blue, the front of the throat and lower belly yellowish white, and the remainder of the under side yellowish brown; the head is almost encircled by a narrow black line; the pale red bill is blackish brown at its culmen. This species is seven inches and one-sixth long; the wing measures two inches and two-thirds, and the tail two inches and one-sixth.

The SLUGGARDS (*Agornithes*) are remarkable for the bristle-like feathers that form a kind of beard; an unusually delicate skin, in which the broad, soft, downy feathers grow but loosely; and still more for their indolent and dreamy disposition.

The JACAMARS (*Galbulæ*) possess a slender body, a long, straight, awl-shaped beak, small delicate feet, with the toes divided into pairs, short wings, and a long tail, composed of strong feathers. The soft, lax plumage, which has a magnificent golden gloss, is replaced by bristles in the region of the beak. The few species of these birds that we are acquainted with occupy the primitive forests of South America, and alike exhibit the same dull and indolent disposition in their manner of life.

The TRUE JACAMARS are recognisable by their long, thin, high beak, which is slightly curved, and furnished with sharp edges; the wings, with their fourth and fifth quills longer than the rest, are comparatively long; the tail, composed of twelve feathers, is long and much graduated; the two outer toes of the foot are united almost to the tip; the hinder toe is very small. The plumage is soft and lax.

THE GREEN JACAMAR.

The GREEN JACAMAR (*Galbula viridis*) is of a magnificent golden-green on the breast and mantle, the remainder of the under side is rust-red; the throat of the male is white, that of the female yellowish red; the exterior tail-feathers are rust-red, tipped with green; the eye is brown; the long, thin beak, the cheek-stripe, and a bare circle round the eye, are black; the feet a brownish flesh-colour.

The Jacamar is numerous met with in the forests along the entire coast of Brazil, where, like its congeners, it leads an indolent and monotonous existence among the branches of the most retired parts of the woods, or perches on a shady bush overhanging a piece of water. Should an insect approach, it is instantly seized, and the bird at once returns to its resting-place, and relapses into its usual condition of quiet indifference to everything around, often remaining almost motionless for whole hours at a time. The loud, clear voice of the Jacamar consists of but one note, which is frequently repeated. The eggs are deposited, like those of the Kingfisher, in holes in an overhanging bank.

The BUCCOS (*Buccones*) constitute a group of equally indolent birds, inhabiting South America, and are recognisable by their slightly-curved beak, slender legs (with two of the toes turned backwards), moderate-sized wings, and a short tail composed of twelve feathers. The remarkably lax, soft plumage is of a sombre hue, and replaced by bristles about the region of the beak.

All the members of this group occupy forests, where they live either alone or in pairs; but rarely

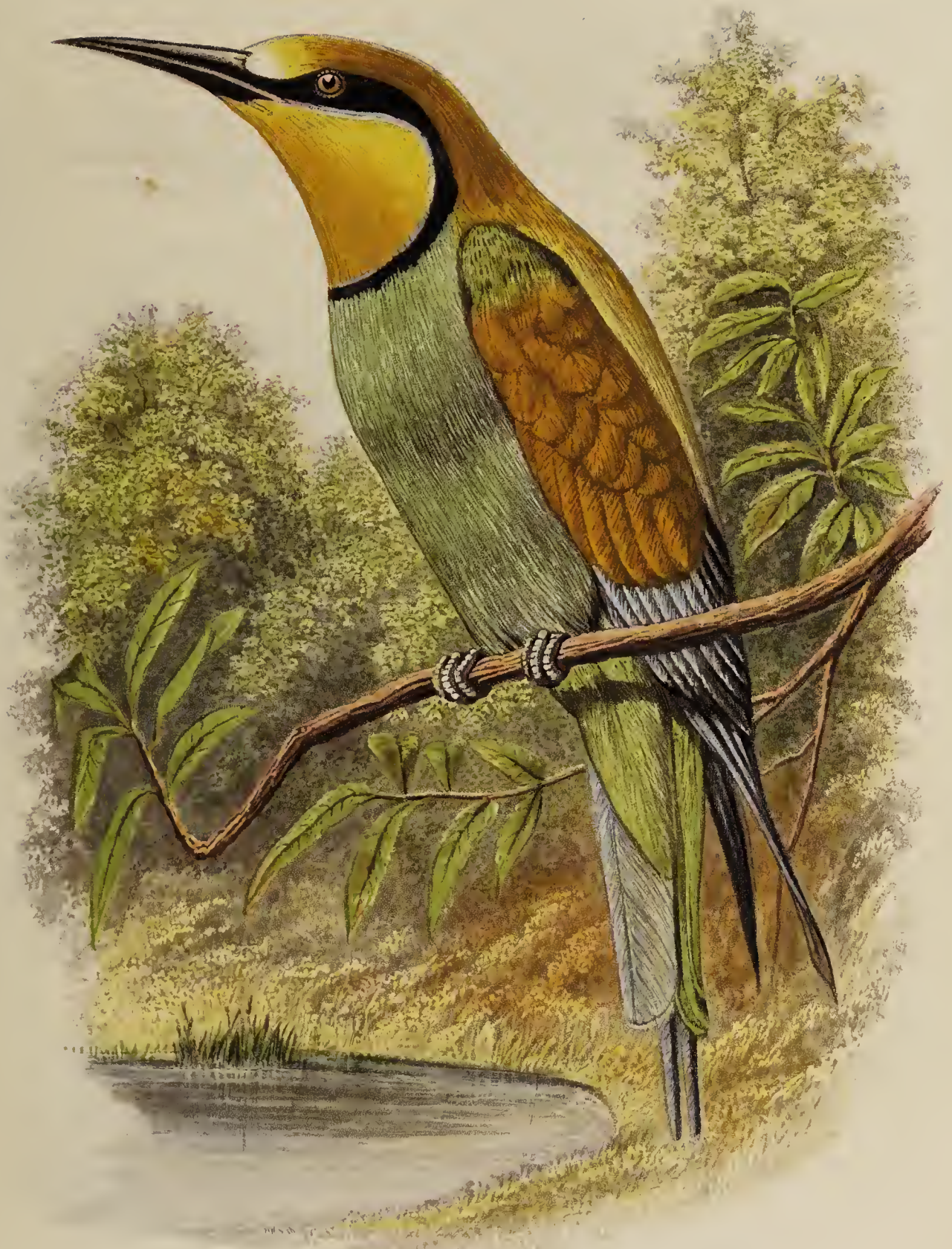
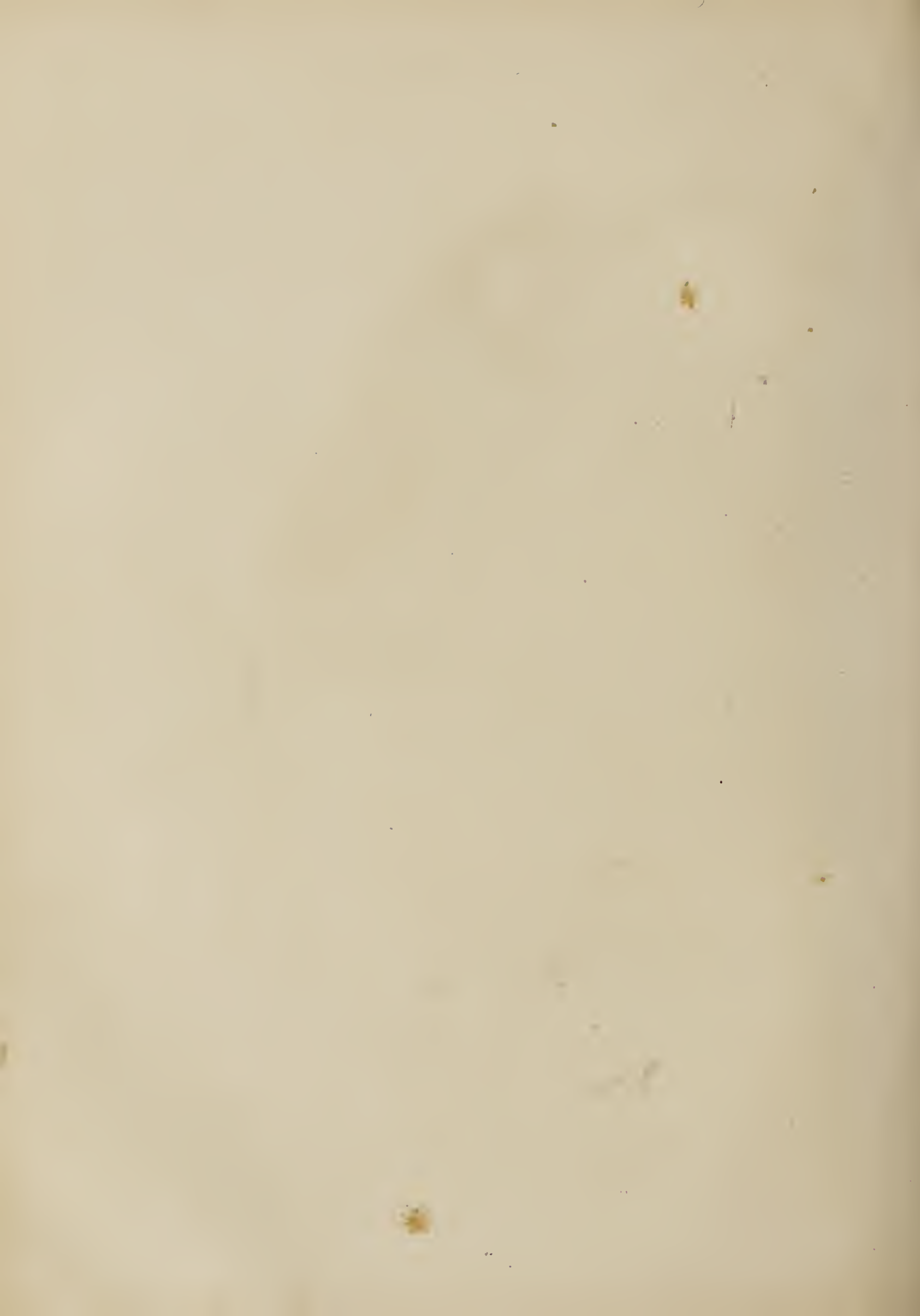


Plate 24, Cassin's Book of Birds

MEROPS APIASTER

EUROPEAN BEE-EATER

(over this, under Nature)



associating even in small parties, and still more rarely venturing near the dwelling-place of man. Like the Jacamars, these birds are remarkable for their indolence, and the quietude of their manner of life, as they obtain their insect-prey without even leaving the branch on which they are perched. The eggs of some species are deposited in holes excavated by the parents; but, beyond this fact, we are without particulars as to their mode of incubation.

The SLEEPERS (*Nystalus*) possess a powerful, straight beak—almost as long as the large, thick head—compressed at its sides, and slightly hooked at the projecting upper mandible. The short,



THE GREEN JACAMAR (*Galbula viridis*).

thick foot and backs of the toes (the latter not placed in pairs) are covered with large, smooth scales; the wings are short and slender, the tail of medium length, and composed of narrow feathers of almost equal size, if we except the short exterior pair.

THE TSCHAKURU.

The TSCHAKURU (*Nystalus Chacuru*) is of a reddish brown on the top of the head, back, and wings, striped with a blackish shade, the under side is white, a band around the head and the broad cheek-stripes are pure white, the region of the cheek is black, the quills greyish brown, those at the exterior edged and spotted with rust-red; the blackish brown tail-feathers are marked with small, yellowish red spots at the edge. The eye is chestnut-brown, the beak dull cinnabar-red, with deep yellowish base, and greyish black culmen and tip; the foot is greyish brown. This species is eight (according to Ratterer nine) inches and a half long, and eleven inches and three-quarters broad; the wing measures three inches, and the tail two inches and three-quarters.

The Tschakuru frequents tracts covered with a slight growth of trees or bushes; on these it may be seen perching for hours together, perfectly undisturbed by the close observation of the traveller, and is frequently only roused from its state of apparent lethargy by violently shaking the surrounding branches. Insects constitute its means of subsistence, and these are obtained either whilst perching or at a few paces from its favourite seat. Azara informs us that the name of Tschakuru is supposed by the natives to represent its cry; but neither the Prince von Wied nor Burmeister ever heard it utter a sound. According to the latter, the numerous white eggs that form a brood are deposited in the hole of a tree.

The TRAPPISTS (*Monasta*) are distinguishable from the above groups by their small, slightly-curved beak, with thin, delicate tip, slender legs, long, pointed wings, and moderate-sized tail, formed of narrow feathers. The plumage is soft, and somewhat woolly in texture; the eye is surrounded by a bare circle.

THE DUSKY TRAPPIST, OR BEARDED CUCKOO.

The DUSKY TRAPPIST, or BEARDED CUCKOO (*Monasta fusca*), is dark brown on the head and back, and yellowish grey on the under side; the lower throat is embellished by a long, pure white crescent, a broad, black band beneath; the quills and tail-feathers are dark greyish brown, the former edged with rust-red on the outer web. The eye is reddish, the beak and foot black. The young are of a paler hue, and the crescent on the breast is shaded with yellow. The length of the body is seven inches and two-thirds, and its breadth twelve inches; the wing measures three inches and one-third, and the tail three inches and one-sixth.

This bird, we learn from the Prince von Wied, is one of the commonest inhabitants of the Brazilian forests. In the neighbourhood of Rio de Janeiro it is also very frequently seen quietly perching beneath a shady bush close to dwelling-houses, or hopping over the ground in pursuit of insects. The "Joao Doido," or Stupid Jack, as this bird is called by the natives, presents a most striking appearance as he sits perfectly motionless, with his white head thrown into strong relief by the dark foliage, his wide-open eyes alone indicating that he is not in a profound sleep. We are without particulars respecting the incubation of this species. Insects of various kinds compose its food; we found the remains of a butterfly in the stomach of a specimen we examined.

The DREAMERS (*Chelidoptera*) are distinguished from the Bearded Cuckoos by their short tail and compact plumage.

THE DARK DREAMER.

The DARK DREAMER (*Chelidoptera tenebrosa*) is of a slaty-black, shaded with blue. The belly is reddish yellow, and the rump white; the eye is dark brown, the beak black, and the foot grey. The length of this bird is eight. and the breadth fourteen inches; the wing measures four inches and a half, and the tail two inches.

The Prince von Wied met with this bird in the bushes about Lagoa Santa, and describes it as quiet and solitary in its habits, passing the greatest part of the day in perching almost motionless upon the topmost twigs, and scarcely rousing from its state of drowsy apathy even when approached within a few paces of its resting-place. Occasionally it descends to the ground, but usually obtains its food by capturing such of the winged inhabitants of the air as venture close to its perch, seizing them after the manner of a Flycatcher, and at once returning to its perch. This species is called the "Wood Swallow" by the Brazilians, on account of its somewhat resembling a Swallow both in form and colour, and this resemblance is also noticeable in its peculiar gait. As regards its nidification,

the Prince von Wied informs us that in the forests of Botokuden, near the Rio Grande del Belmont, he observed one of these birds enter a hole in a perpendicular sandbank, and, on digging to the depth of a couple of feet, obtained two white eggs, which were laid on a thin stratum of feathers.

The TOURACOS, or TROGONS (*Trogones*), constitute a numerous group of equally dreamy, but gloriously plumaged birds, inhabiting the tropical zones of both hemispheres. All have a slender, but very thickly-feathered body, short, broad, triangular, and much-curved beak, with a hook



THE DUSKY TRAPPIST, OR BEARDED CUCKOO (*Monasta fusca*).

at its tip, and occasionally incised at its margins. The small, slender legs are almost entirely covered with feathers; the toes, the innermost of which turns backwards, thus pairing with the hinder toe, are short; the small, much-rounded wings are composed of narrow, stiff-shafted, sickle-shaped quills, pointed at their extremity; the long tail contains twelve feathers; of these, the three outermost are much shorter than the rest. The lax, downy plumage is resplendent with metallic lustre; and the base of the beak covered with a bristle-like growth. The various members of this group are alike remarkable for their dull, indolent disposition, and spend their lives in lazily droning upon the branches of their favourite trees, only rousing themselves to take a short flight in pursuit of a passing insect. Their food principally consists of various kinds of insects, fruit, seeds, or portions of plants; while some appear to be entirely restricted to vegetable diet. Holes in trees are used as receptacles for the eggs, which are from two to four in number, round in shape, with a very light or white shell.

The FIRE TOURACOS (*Harpactes*), a group of these birds inhabiting Southern Asia, are recognisable by their powerful, much-curved, and smooth-margined beak, their partially-feathered feet, short wings, and long, graduated tail.

THE KARNA, OR MALABAR TROGON.

The KARNA, OR MALABAR TROGON (*Harpactes fasciatus*), a well-known species, is of a chestnut-brown on the upper portion of the body, and black on the head and throat; the feathers of the wing-covers are striped black and white, while the breast and entire under side are of a vivid scarlet; the black throat is divided from the breast by a narrow white band; a line from the back of the eyes to the head is bright red, and a bare patch round the eye of a blueish shade; the centre tail-feathers are reddish brown, and those at the exterior black and white; the eye is dark brown, the beak deep blue, and the foot of a purplish hue. The female is without the black upon the head; her upper secondary quills and the feathers on the wing-covers are black and brown, and her entire under side ochre-yellow. The length of this species is twelve and its breadth sixteen inches; the wing measures five and the tail six inches.

The Malabar Trogon, as we learn from Jerdon, "is found in the forests of Malabar, from the extreme south to about seventeen degrees north latitude, reaching up the Ghâts and hill ranges at least 3,000 feet. It is also found in some of the forests of Central India and in Ceylon. It, however, usually prefers the more elevated situations, at about 2,000 feet or so, and keeps generally to the thickest parts of the wood. It is often to be seen seated motionless on a tree, occasionally flying off to capture an insect on the wing, sometimes returning to the same perch, but oftener taking up a fresh position, and in this way wandering about a good deal. It is usually solitary, sometimes in pairs, and I have seen four or five together. Its food consists of insects, chiefly coleopterous. I am not aware of having heard its note, and certainly have found it generally a silent bird. Trikell, however, says it has a wild, querulous note, like the mewling of a cat. Its Hindustani name is given from its sitting with the head sunk into its shoulders, as if it had no head, or as if dressed in a faquir's *kufui*."

The FLOWER TOURACOS (*Hapaloderma*) are distinguished from the above birds by the incised margins of their beaks, and the slenderness of the short, exterior tail-feathers.

THE NARINA.

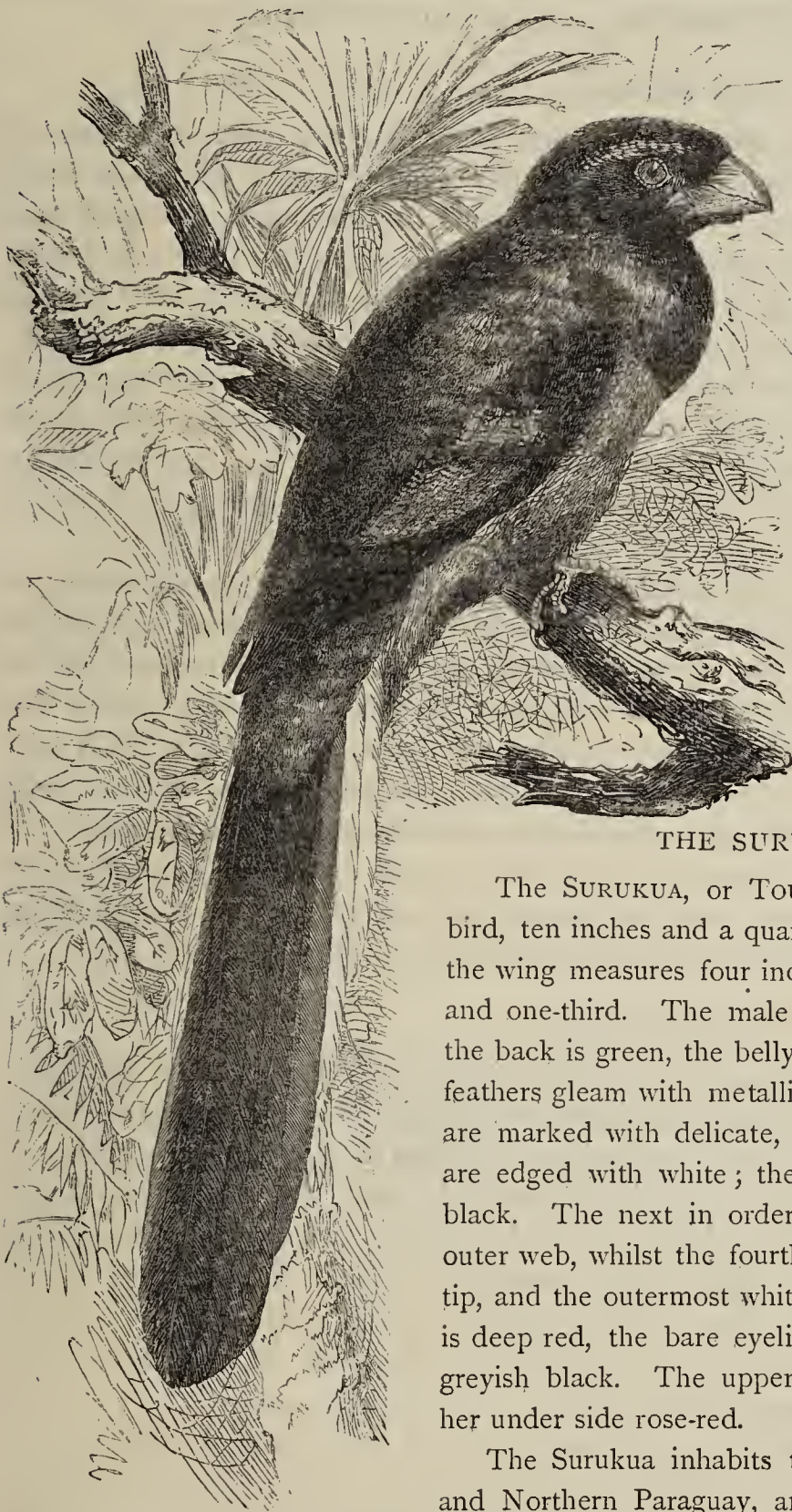
The NARINA (*Hapaloderma narina*), the only species of this group with which we are at present acquainted, is of a magnificent golden green on the entire mantle, centre tail-feathers, and throat; the lower breast and belly are deep rose-red, the large wing-covers grey, striped with black, the quills black, with white shafts, and the small wing-covers beautiful golden green; the exterior tail-feathers are white on the outer and blackish on the inner web. In the plumage of the female all these shades are duller than in that of her mate; her brow and throat are brownish red, and her tail-feathers brownish black.

Le Vaillant first discovered the Narina in the extensive forests of Caffraria, Rüppell met with it near the Abyssinian coast, Heuglin at Fossokel and on the White River, and Du Chaillu on the shores of the Zambesi; we, ourselves, were only once lucky enough to see this beautiful bird, and that was a few miles from the coast of the Red Sea. We learn from Jules Verreaux that in Southern Africa the Narina principally frequents the mighty forests east of the Cape of Good Hope. In these retreats it leads a solitary and very sedentary life, only rousing itself to activity morning and evening, in order to procure food. So peculiar is the deportment of this bird as to render its identity quite

unmistakable, as it sits bolt upright, with tail hanging negligently down, and head drawn closely in. Its flight is hovering and almost noiseless. During the period of incubation it utters a wailing, resonant cry, which frequently deceives the traveller as to its whereabouts, for the bird possesses the

power of ventriloquism to a remarkable degree. Its food consists principally of beetles and flies. According to Le Vaillant, the Narina deposits four round, white eggs in a hollow tree; while Verreaux states that the young are hatched in twenty days, and remain for a considerable time under parental care after they are fully fledged.

The TROGONS PROPER (*Trogon*) constitute an American group, recognisable by their broad, high beak, the upper mandible of which is much vaulted, slightly hooked at its extremity, and incised at the margins. The wings are short and blunt, the graduated tail of moderate length, and the plumage lax, soft, and composed of broad feathers.



THE NARINA (*Hapaloderma narina*).

THE SURUKUA, OR TOURACO.

The SURUKUA, or TOURACO (*Trogon Suracua*), is a magnificent bird, ten inches and a quarter long, and fourteen and a half broad; the wing measures four inches and a half, and the tail three inches and one-third. The male is blueish black on the head and throat, the back is green, the belly blood-red. The back, throat, and head-feathers gleam with metallic lustre, the feathers on the wing-covers are marked with delicate, undulating lines of black and white, and are edged with white; the centre tail-feathers are blue tipped with black. The next in order are black with a blueish green on the outer web, whilst the fourth and fifth on each side are white at the tip, and the outermost white on the entire exterior web. The eye is deep red, the bare eyelid orange, the beak whitish, and the foot greyish black. The upper part of the female's body is grey, and her under side rose-red.

The Surukua inhabits the primitive forests of Southern Brazil and Northern Paraguay, and passes its life in a state of the utmost inaction, remaining motionless for hours together, upon a branch, and scarcely rousing sufficiently to turn its head at the sight of a passing insect; so complete is this condition of dreamy indolence, that Azara assures us one of these birds may be struck down from its perch with a stick. The flight of this species is soft and owl-like. The eggs are deposited in holes excavated in such nests of the termite as are situated upon trees.

Azara mentions having seen a Surukua hanging like a Woodpecker from the moss, as it hollowed out a cavity with its beak, his mate meanwhile remaining quietly perched upon a neighbouring branch, and apparently stimulating her mate to renewed exertions by her gestures and glances; at this period, the constantly-repeated cry of the male resembles the syllables "pio, pio." The eggs, two to four in number, and of a white colour, are laid in September. The flesh of the Surukua is excellent.

THE POMPEO.

The POMPEO (*Trogon viridis*) is of a splendid steel-blue, shimmering with green on the crown of the head, nape, sides of the throat, and upper breast; the back, shoulders, and upper wing-covers are of a metallic green, shading into blue on the rump; the belly and vent are bright, deep yellow. The exterior feathers of the wing-covers and the quills are black, the latter edged with white; the centre tail-feathers are green, bordered with black towards the extremity. The next in order are black with a green edge; the three outermost are white at the tip and on the exterior web. In the female the back is deep grey, the belly pale yellow, and the feathers of the wing-covers delicately striped with white. The eyes of both sexes are brown, the beak pale greenish white, and foot blackish grey. This species is twelve inches and three-quarters long, and eighteen inches and a half broad; the wing measures five inches and three-quarters, and the tail five inches and one-third.

The Pompeo is commonly met with in the forests of North Brazil and Guiana; and, according to the Prince von Wied, is most numerous in the plantations near the coast, where its short, monotonous cry is to be heard in all directions. The habits of this species closely resemble those of the Surukua. We are told, on the authority of Schomburghk, that the Pompeo consumes seeds and fruit, as well as insects, and that the nest, which is supported upon thin branches or twigs, is very similar to that of the Wild Pigeon; but for the accuracy of this latter statement we cannot vouch. The capture of these birds, which are usually met with in pairs or small parties, is attended with but little difficulty, as they are quite fearless of men; the Brazilians, we are told, are constantly in the habit of obtaining a meal at their expense by an imitation of their call-note, which at once brings down the unsuspecting victim, and thus affords the hunter or traveller an appetising repast.

THE TOCOLORO.

The TOCOLORO (*Prionotelus temnurus*), a species inhabiting Cuba, differs from all its congeners in the remarkable formation of its graduated tail, the feathers of which become gradually broader towards the tip, where the web takes the form of a crescent. The top of the head, nape, back, and upper breast are pale grey, and the belly a rich cinnabar-red; the quills are brown, striped with white, the feathers of the large wing-covers steel-blue, shaded with white. The centre tail-feathers are of a deep metallic green, the next in order blueish green, and the three outermost tipped with white. The eye is of a brilliant reddish yellow, the foot blackish brown, and the beak deep brown, with bright red lower mandible. The length of the body is ten inches, and the span of the wings fifteen inches, the wings and tail each measure five inches.

The Tocoloro is common in some parts of Cuba, and in its habits closely resembles the members of the group already mentioned. D'Orbigny describes its cry as resembling the syllables "to-corr," long drawn out, the first note being shrill and powerful, while the second is deep and low. Flowers, fruit, and seeds appear to constitute its principal means of subsistence. The period of incubation takes place in April, May, and June; the nest is usually made in holes in trees, those excavated by the Woodpecker being preferred. The eggs are round, pure white, and from three to four in number.

The BEAUTIFUL-TAILED TROGONS (*Calurus*), as the largest members of this family are called, are at once recognisable by their comparatively broad, flat head and shallow beak, which is compressed and very decidedly-hooked at its tip. The plumage of the wings and tail is remarkably developed, and of great beauty.

THE PEACOCK TROGON.

The PEACOCK TROGON (*Trogon calurus*) has the central tail-feathers of great length. The feathers of the head, throat, upper breast, and wing-covers are of a bright, metallic green, and gleam with a copper-red and violet lustre; the lower breast, belly, rump, and thighs are purplish red; the inner side of the wings, the quills, and tail are black. The eye is a dull, carmine-red, and the bare patch that surrounds it dark grey; the beak is deep red, tipped and edged with yellow, and the foot brown and yellow. The female resembles her mate, but is somewhat less bright in hue. The length of this bird is fourteen inches and a quarter, and its breadth twenty-two inches and a half. The wing measures seven inches and a quarter, and the tail seven inches; the centre tail-feathers exceed the rest by six inches and a half. Spix first discovered this bird at Rio Negro.

THE BEAUTIFUL TROGON.

The BEAUTIFUL TROGON (*Calurus Pharomacrus* or *C. antisianus*)—(See Coloured Plate XXV.)—is recognisable from the Peacock Trogon by a bunch of hair-like feathers on the region of the beak, and by the inferior length of the long feathers on the wing and tail. The coloration of the plumage is almost identical, except that the tail-feathers are quite white underneath, and the beak of a yellowish shade. The body is fourteen inches long; the wing measures seven inches and a half, and the tail six inches and a half. D'Orbigny discovered this bird in Bolivia, where it frequents the vicinity of the rivers.

THE QUESAL, OR RESPLENDENT TROGON.

The QUESAL, or RESPLENDENT TROGON (*Calurus paradiseus*, or *C. resplendens*), the most magnificent of all these beautiful birds, is adorned with a helmet-like crest, and possesses a most extraordinary development of the feathers on the shoulders, which droop over the wings and tail. The mantle and upper breast are of a brilliant, golden green. The under side is bright carmine-red. The eye is deep nut-brown, the eyelid black, the beak yellow, with a brownish base; the foot brownish yellow. The female has a smaller crest, and the long feathers in her tail scarcely exceed the other tail-feathers in length. In both sexes the head, throat, and upper breast are dark green; the back, shoulders, and upper tail-covers light green; and the lower breast and belly greyish brown. The rump is bright red, the centre tail-feathers are black, those at the exterior white, marked with black. The length of the body is sixteen inches; the wing measures eight inches and one-third, and the tail eight inches and a half. The longest feathers in the male bird's tail exceed the rest by twenty-five inches.

The Quesal inhabits Mexico and Central America; and, according to Salvia, is met with in all such woods and forests as are at a height of about 6,000 feet above the level of the sea. In these situations it leads a quiet and dreamy existence, perching lazily in the trees, and scarcely exerting itself to do more than slowly turn its head from side to side, or raise and waft its graceful, drooping plumes. Only in the air, however, is the beauty of the Quesal seen in its full perfection; and as it floats rapidly but gently along, with feathery train outspread, those who have witnessed its elegant movements will admit that amongst all the inhabitants of the Western Hemisphere it is without a rival. The voice of this bird is capable of producing a great variety of sounds; the principal note, however, is a piping tone, which commences softly, and gradually swells into a loud



QUESAIS, OR RESPLENDENT TROGONS (*Calurus paradiseus*, or *C. resplendens*).

but not displeasing cry. Fruit and insects appear to form its principal means of subsistence. We learn from Owen that he found a Quesal's eggs deposited in a hollow tree, about six feet from the ground. Salvia is of opinion that the male does not assist in the work of incubation.

THE CUCKOOS.

THE CUCKOOS (*Cuculidæ*) constitute a very numerous family, characterised by a slender body, wings of moderate length, a long, graduated tail, composed of from eight to twelve feathers, a slightly-curved, short, or medium-sized beak, with sharp margins, and comparatively long, powerful feet furnished with short toes. The coloration of the plumage is too various to admit of any general description.

The HONEY GUIDES (*Indicator*) are a group of the above birds recognisable by their comparative compactness of build, long wings, short tail, and strong beak. The beak, which does not equal the head in length, is almost straight, and compressed at its hooked tip; the small powerful legs have the tarsi shorter than the outermost of the strong toes; the long and pointed wing, in which the third quill exceeds the rest in length, is usually of considerable breadth; the tail, composed of twelve feathers, is rounded at its sides, and slightly incised at its centre. The plumage is thick and smooth.

The members of this family are for the most part of African origin, only two species being met with elsewhere, namely, in Southern Asia. Everywhere the Honey Guides occupy woodland districts, and live either in pairs or small flocks, which fill the air with their loud and pleasing cries, as they flutter from tree to tree. According to Heuglin, the most peculiar characteristic of these birds is their strange habit of endeavouring to attract the attention either of man, or of some of their formidable four-footed neighbours, whenever they have the luck to discover an attractive object, such as a piece of carrion, teeming with a rich supply of insects, or a swarm of bees busy at their work. They are particularly fond of honey, though they frequently pay dearly for their venturesome attempts to rob the combs, being often stung to death by the angry swarm. When this fate attends a marauder, the bees cover the body with a vault of wax, and thus prevent any annoyance from its presence. The flight of the Honey Guides is heavy, and only capable of being sustained for a short distance, but they run upon the trunks and branches of trees with the utmost facility. Like the Cuckoo, the members of this group build no nest, but introduce their eggs into that of some Woodpecker or Oriole.

THE WHITE-BEAKED HONEY GUIDE.

The WHITE-BEAKED HONEY GUIDE (*Indicator albirostris*) is greyish brown on the mantle, and whitish grey on the under side. The throat is black; the region of the ear undivided, and indicated by a greyish white spot; a portion of the shoulder-feathers is streaked with black; the quills are greyish brown, the wing-covers broadly edged with white, and the shoulders enlivened by a yellow patch; the centre tail-feathers are brown, the next in order brown on the outer and white on the inner web, whilst those at the exterior are white tipped with brown. The body is yellowish white, and the foot brown. The body is six inches and a half in length; the wing measures four inches and a half, and the tail two inches and a half.

This species, which is met with from Southern Africa to sixteen degrees north latitude, subsists almost entirely upon wild honey, and has obtained its name from the fact that it frequently materially

assists the natives in their search for the combs by flying before them and constantly uttering its sharp, peculiar cry. In the African deserts it is heard morning and evening, and is eagerly listened for by the natives, who at once reply to it, and hasten to the spot indicated. No sooner does the bird perceive that its summons is responded to than it perches upon the tree that contains the desired hive, and, should its human assistant not hurry fast enough to satisfy its impatience, flies backwards and forwards until the exact spot has been plainly pointed out. During the time occupied by the native in rifling the hive, the Honey Guide remains perched in the vicinity, waiting for the share of the spoil, which the grateful Hottentot never fails to grant it. This remarkable habit is of great service to the poor natives, who regard these birds with especial favour, and are much incensed if they are wantonly killed. According to Hartlaub, the female deposits her one glossy white egg upon the bare ground, and when she has succeeded in finding a strange nest into which it can be introduced, bears it thither, having previously ejected one of the owner's eggs in order to make room for her own offspring. Verreaux informs us that the mother resumes the care of her young in about a month's time, compelling it to leave its foster-parents.

The CUCKOOS (*Cuculus*) are characterised by a slightly-curved, thin beak, which is broad at its base, and almost equals the head in length; the long wings, in which the third quill is longer than the rest, are narrow and pointed; the long tail, composed of ten feathers, is either wedge-shaped or rounded at its extremity. The short or moderate-sized feet have the toes placed in pairs; the thick plumage is very similarly coloured in the two sexes, but the young differ considerably in appearance from the adult birds.

The members of this family are spread over the whole of the Eastern Hemisphere and New Holland, being particularly numerous in Africa and India, while the more northern portions possess but one species. All, without exception, are inhabitants of the woods, and rarely leave the shelter of their favourite trees, except during the period of migration, or when, as with the more southern species, they are wandering for a short season over the face of the country. In disposition they are timorous, restless, and extremely averse to associate with other birds, indeed, they frequently avoid the society of their own congeners. Their life may be described as an incessant and noisy search for food, in pursuit of which they hurry rapidly from tree to tree and place to place. Insects and larvæ afford them their principal means of subsistence, and hairy caterpillars (avoided by most other birds) are with them favourite tid-bits—the hairs from the bodies of these caterpillars adhere to the coats of the Cuckoo's stomach, and become, as it were, embedded by the process of digestion. Many also consume small reptiles. Some species prepare suitable receptacles for their young; but the greater number deposit their eggs in the nests of other birds.

THE COMMON CUCKOO.

The COMMON CUCKOO (*Cuculus canorus*) represents a group possessing a slender body, a small, weak, slightly-curved beak, long, pointed wings, a long, rounded tail, short, partially-feathered feet, and plumage of a sombre hue. The male is deep ash-grey, or greyish blue, on the mantle, and greyish white, marked with black, on the under side; the neck, cheeks, throat, and the sides of the neck, as far down as the breast, are pure ash-grey; the quills of the wings leaden black, and those of the tail black, spotted with white. The eye is of a bright yellow; the beak black, but yellowish towards its base; and the foot yellow. The female resembles the male, but has scarcely perceptible reddish stripes on the back and under side of the neck. The length of the male is fourteen inches; breadth twenty-four and a half; length of wing, nine inches; length of tail, seven and three-quarter inches. The female is about an inch shorter.

This Cuckoo frequents almost every part of Europe, Asia, and Africa, and breeds in all northern portions of the Eastern Hemisphere; it only visits India, China, Java, the Sundainu Islands, and South-western Africa in the course of its migrations. In England it usually appears about the middle of April.

The Common Cuckoo may be regarded as the most flighty, restless, and lively member of this sprightly family; from morning till night he is constantly on the move, and is as hungry as he is active and clamorous. His flight is light, elegant, somewhat resembling that of a Falcon; but no sooner has his journey come to an end, than he alights on a thick branch of the nearest tree, and at once begins to look about him in search of food. Should an attractive morsel be in sight, he swoops upon it in an instant, and having caught and devoured it, by a stroke or two of his powerful wings he again returns to the branch he has just quitted, or else flies off to a neighbouring tree, immediately to repeat the same performance. It is, however, only in his powers of flight that the Cuckoo is eminently gifted; he walks upon the ground with difficulty, and is quite unable to climb. In spring-time he is indefatigable in making heard his well-known notes, "Cuckoo, cuckoo," which occasionally he will change to a softly-uttered "Quawawa," or "Haghaghaghag," while the voice of the female somewhat resembles a peculiar laugh or gentle twitter, but poorly represented by the syllables "Kwikwikwik." It was well-known, even to ancient writers, that the female Cuckoo, instead of building a nest for the reception of her progeny, lays her eggs in the nests of other birds, to whom she altogether entrusts the rearing of her young ones.

"The Cuckoo," says Aristotle, "deputes the incubation of her eggs and the nurture of the young ones to which they give birth to the bird in whose nest the eggs happen to be laid. The foster-father, as we are told, throws his own offspring out of their nest and leaves them to die of hunger, while he devotes himself entirely to providing for the young Cuckoo. Others say that he kills his own nestlings to feed the young intruder with their bodies, the young Cuckoo being so beautiful that even the mother who owns the nest despises and sacrifices her own brood on his behalf. Narrators, however, are not quite agreed as to who is the real destroyer of the young birds; some say that it is the old Cuckoo who comes back again to eat the little family of the too hospitable pair, while others assert that it is the young Cuckoo who casts out of the nest all his foster brothers and sisters, leaving them to die of starvation, while others again declare that the young Cuckoo, being the strongest, kills and devours all the rest."

"In thus providing for his children," continues Aristotle, "the Cuckoo does quite right, for he knows what a coward he is, and that he would never be able to defend them; indeed, so cowardly is he that all the little birds amuse themselves by pinching and pecking at him."

It will be at once evident that in the above account of the habits of the Cuckoo there is a great deal of truth, although much that is surmised is devoid of foundation. The main facts that have been established by trustworthy observation relative to the breeding of the Cuckoo are in themselves sufficiently curious, and have no need of fictitious circumstances to make them interesting. They may be briefly stated as follows:—The female Cuckoo undoubtedly deposits her eggs in the nest of some other bird, not of any particular species, but of several; indeed, upwards of fifty have been enumerated as entitled to the honour of rearing the young Cuckoos. Secondly, it has been observed that the eggs of the Cuckoo differ remarkably from each other; indeed, more so than is the case in any other known species; and, moreover, that a Cuckoo's egg taken from the nest in which it has been placed is found strikingly to resemble the eggs laid by the owner of the nest. Thirdly, the Cuckoo only lays a single egg in the selected spot, and this is invariably deposited in a nest already containing eggs belonging to its proper owner.

The behaviour of the females while thus employed in laying their eggs is peculiar. No sooner

do these birds arrive in the early spring than the males begin to make the woods resound with their well-known call, where they are soon joined by their mates, of whose coyness under the circumstances they can have little cause for complaint, and as soon as the female has an egg ready for laying, away she flies in search of a nest in which to deposit her burden. On these expeditions she is not accompanied by the male Cuckoo, with whose company, indeed, she seems by no means desirous of being troubled. Her search after a suitable nest is always made on the wing, and her cleverness in finding the object of her journey, however well it may seem to be hidden from observation, is at least remarkable. Quite contrary to her usual shyness, at such times she will unhesitatingly approach



THE CUCKOO (*Cuculus canorus*).

quite close to human habitations, and even enter buildings, such as barns and outhouses. If the shape and situation of the discovered nest is such as to allow her to do so, she places herself upon it and lays an egg, but if such is not the case she lays her egg upon the ground, and then taking it in her beak drops it into the nest. Sometimes it happens that she has considerable difficulty in introducing her egg into the nest, owing to the smallness of the aperture, and occasionally the bird has been captured during her endeavours to overcome the difficulty. Sometimes it has happened that two Cuckoos' eggs, of different colours, have been found in the same nest.

"It is wonderful to observe," says Bechstein, "what great apparent delight the birds show when they see a female Cuckoo approach their abode. Instead of leaving their eggs, as they do when disturbed by the approach of other animals, they seem quite beside themselves for joy. The little Wren, for example, when brooding over its own eggs, immediately quits its nest on the approach of

the Cuckoo, as though to make room to enable her to lay her egg more commodiously. Meanwhile she hops round her with such expressions of delight that her husband at length joins her, and both seem lavish in their thanks for the honour which the great bird confers upon them by selecting their nest for its own use."

Although the above extract sounds very well, with all deference to Herr Bechstein, we are compelled to say that it is unfortunately not true. All the birds that we have seen who have had the very doubtful honour of having a Cuckoo's egg palmed upon them as their own, have seemed to testify in a striking manner their anguish at the threatened occurrence and their unmistakable



THE JAY CUCKOO (*Coccyzus glandarius*).

desire to drive the Cuckoo away. So far from coming as a welcome visitor, the mother Cuckoo comes like a thief in the night; and no sooner has she laid her egg than she hastily takes her departure, as if quite conscious of the unfriendly character of her visit. However this may be, there is no doubt that the foster-parents brood over the Cuckoo's egg with the same assiduity as over their own; and it is only when the eggs of both are hatched that the real character of the intruder begins to show itself, doubtless to the great terror and dismay of the proper owners of the nest.

"Two Cuckoos and a Hedge Sparrow," writes Dr. Jenner, "were hatched in the same nest this morning. In a few hours after, a combat began between the Cuckoos for the possession of the nest, which continued undetermined until the next afternoon, when one of them, which was somewhat superior in size, turned out the other, together with the young Hedge Sparrow and an unhatched egg. This contest was very remarkable. The combatants alternately appeared to have the advantage, as each carried the other several times to the top of the nest, and then sank down again, oppressed by

the weight of its burden, till at length, after various efforts, the strongest prevailed, and was afterwards brought up by the pair of Hedge Sparrows."

"It is wonderful," continues Dr. Jenner, "to see the extraordinary exertions of the young Cuckoo when it is two or three days old, if a bird be put into the nest with it that is too weighty for it to lift out. In this state it seems ever restless and uneasy; but this disposition for throwing out its companions seems to decline from that time till it is about twelve days old, when, as far as I have seen, it ceases entirely. Indeed, the disposition for throwing out eggs appears to cease a few days sooner, for I have frequently seen the young Cuckoo, after it had been hatched nine or ten days, remove a nestling that had been placed in the nest with it, while it suffered an egg, put there at the same time, to remain unmolested. The singularity of its shape is well adapted to these purposes, for, unlike other newly-hatched birds, its back, from the shoulders downwards, is very broad, with a considerable depression in the middle. This depression seems formed by Nature for the design of giving a more secure lodgment to an egg or a young bird, when the Cuckoo is employed in removing either of them from the nest. When it is twelve days old, this cavity is quite filled up, and then the back assumes the shape of nestling birds in general."

The JAY CUCKOOS (*Coccyzus*) are recognisable by their elongate body; thick, broad, curved beak, which is compressed at its sides and almost equals the head in length; strong and comparatively long and partially-feathered feet; moderate-sized wing, in which the fourth quill is the longest; and long, conical tail, composed of narrow feathers, the outermost of which are only half the length of those in the centre. The smooth plumage takes the form of a crest upon the head, and is similarly coloured in both sexes. This group is almost peculiar to the African continent.

THE JAY CUCKOO.

The JAY CUCKOO (*Coccyzus glandarius*) is deep grey on the head, greyish brown on the back, and greyish white on the under side. The throat and upper breast are reddish yellow; and the feathers on the wing-covers and the secondary quills have broad, triangular, white spots at their tips; the eye is deep brown, the beak purplish grey, and the foot greyish green. This species is about fifteen inches long; the wing measures eight, and the tail eight and a half inches.

The Jay Cuckoo is very numerously met with in some parts of Africa, and from thence wanders forth into Europe, appearing occasionally in Greece and Italy. It is often known to breed in Spain. Such of these birds as inhabit Egypt principally frequent the small groups of mimosa that abound in the valley of the Nile, and live in pairs or small parties, according to our own observation, remaining together even during the breeding season. Like its European brother, this species is of a restless and violent temperament, engaging constantly in fierce strife with its male companions during the period of incubation. Its flight is rapid, and so skilful as to enable the bird to penetrate the densest thickets without a moment's hesitation. It rarely descends to the ground, but obtains the insects and caterpillars on which it subsists either while on the wing or when perching among the branches. Its voice, which somewhat resembles that of a Jay, can be heard at a considerable distance, and has a laughing but monotonous sound. The female, like the rest of her congeners, deposits her eggs in another bird's nest. Baedeker describes the egg as of a light blueish green, spotted with grey or brown, and dotted all over with reddish brown; at the broad end the spots take the form of a wreath. In form the eggs are similar to those of other Cuckoos, but in size resemble those of the Jay.

The KOELS (*Eudynamis*), a small group of Cuckoos inhabiting Southern Asia and Oceania,

possess a strong, thick beak, the upper mandible of which is much curved, and hooked at its tip, while the lower portion of the bill is nearly straight. Their feet are strong, their wings of moderate size, the tail long and rounded; the soft plumage is of very uniform hue, that of the male being usually black, and that of the female black spotted with white.

THE KOEL, OR KUIL.

The KOEL, or KUIL (*Eudynamys orientalis*), is the best known member of the above group. The male is entirely of a glossy greenish black, while the female is of a rich, deep green, spotted with white above, and striped with white on the quills and tail. The under side is white, with black oval markings on the throat, and heart-shaped spots upon the breast. The eye of both is scarlet, the beak pale green, and foot greyish blue. The length of the male is thirteen inches and a half, and the breadth twenty-three inches; while the female measures seventeen inches and a half, and is twenty-four inches across the wings.

“This well-known species,” writes Jerdon, “is found throughout India, extending to Ceylon, the Burmese countries, and parts of Malayana, to the Philippines. It frequents groves, gardens, avenues, and open jungles; and feeds almost exclusively, I believe, on fruits of various kinds, especially on those of the banyan, peepul, and other figs, also, says Blyth, much on that of the *Mimasops elengi*. Several of these birds may be often seen on one tree, but they are not gregarious. Mr. Blyth states that they eject from the mouth the large seeds of any fruit that they have eaten. The Koel is by no means a shy bird, but has the usual quick, unobtrusive habits of the ordinary Cuckoos, as it glides about the branches of trees; when it takes wing, however, it is remarkable for the loudness of its cries. About the breeding season the Koel is very noisy, and may then be heard at all times, even during the night, frequently uttering its well-known cry, of ‘Ku-il, ku-il,’ increasing in vigour and intensity of utterance as it goes on. The male bird has also another note, which Blyth syllables as ‘Ho-whee-ho,’ or ‘Ho-y-o.’ When it takes flight it has yet another somewhat melodious and rich liquid call, all thoroughly *Cuculine*. The female Koel deposits her eggs almost exclusively in the nest of the Common Crow (*Corvus culminatus*). She generally lays only one egg in each nest, and mostly, but not always, destroys the eggs of the proprietor at the time of depositing her own. It is a popular belief that the Crow discovers the imposture when the young Koel is nearly full grown, and ejects it from her abode; but this I do not think is usually if ever the case, for I have frequently seen Crows feeding the young Koels, even after they have left the nest in which she has placed her eggs, and when the birds are fully grown entices them away, or, if expelled, looks after them and feeds them for a few days, but I greatly doubt if this be the general practice.” The egg of the Koel is pale olive-green, with numerous reddish, dusky spots, having a tendency to form a zone at the broad end. The Crows would appear to be desirous of avenging the wrongs they receive from these Cuckoos, for at times we see them pursuing the Koel with the utmost energy. Mr. Frith, as quoted by Blyth, states that one dashed itself against a window and was killed when thus hunted by a Crow. The flight of the Koel is not so quiet and gliding as that of the True Cuckoos, but is performed with more numerous strokes with the wing.

The GOLDEN CUCKOOS (*Chrysococcyx*), as a most gorgeous group have been appropriately called, inhabit the equatorial regions of Asia, Africa, and Australia. These birds are distinguished by their comparatively small, slender body, long wings, and tail. The beak, which is of medium size, exactly resembles that of the Common Cuckoo; the tarsi are short, and the toes long; the wing is pointed, the tail rounded at its sides, and the compact, large-feathered plumage dyed with hues of more than metallic brilliancy.

THE DIDRIK, OR GOLDEN CUCKOO.

The DIDRIK, or GOLDEN CUCKOO (*Chrysococcyx auratus*), is of a dazzling metallic green, shaded with copper-red over the entire mantle, the glowing effect being heightened by a blueish effulgence at the tips of some of the feathers. A white stripe passes behind the eye, and the brow is decorated with a white spot; the entire under side is light brownish or yellowish white, of so delicate a shade that exposure to the sun's rays soon renders it almost white. The feathers on the sides, tail, and lower wing-covers are greenish; the secondaries, exterior primaries, and outer tail-feathers deep green,



THE DIDRIK, OR GOLDEN CUCKOO (*Chrysococcyx auratus*).

striped with white; the eye is deep yellowish brown (during the breeding season that of the male is deep red), the eyelid coral-red, the beak deep blue, and the foot light greyish blue. The male is seven inches and a half long, and twelve inches and three-quarters across; the wing measures four inches and one-sixth, and the tail three inches and a quarter. The female has a spotted under side, and is somewhat smaller and less gorgeous than her mate. In the young birds the lower parts of the body are shaded with yellow, the breast and throat of a metallic green, the feathers on the back edged and the quills spotted with reddish yellow.

According to Le Vaillant, the Didrik is numerously met with throughout Southern Africa, where it inhabits the primitive forests, and frequents the loftiest and most densely foliaged trees. Heuglin, who observed this species near the White and Black Nile and in Abyssinia, tells us that it often associates in small parties, and occasionally ventures down upon the trees and hedges that surround

the villages, making itself very conspicuous by its loud, flute-like, piping cry and pugnacious propensities. The snow-white eggs of the Golden Cuckoo are always deposited in the nest of another bird.

The GIANT CUCKOOS (*Scythrops*), a group comprising the largest of all Cuckoos, have derived their name from the formation of their beak, which resembles that of the Toucans, being



THE GIANT CUCKOO, OR CHANNEL-BILL (*Scythrops Novæ Hollandiæ*).

nearly as long as their head, thick, strong, broad at its base, compressed at its sides, and hooked at the tip. The tarsi are short, and toes powerful; the wing, in which the third quill is the longest, extends almost to the middle of the comparatively short, rounded tail; the latter is formed of ten feathers. The plumage somewhat resembles that of the Common Cuckoo in its coloration; the cheek-stripes and region of the eyes are bare.

THE GIANT CUCKOO, OR CHANNEL-BILL.

The GIANT CUCKOO, OR CHANNEL-BILL (*Scythrops Novæ Hollandiæ*), the only species with which we are acquainted, is grey upon the head, throat, and breast; the mantle, wings, and tail are greenish

grey, each feather tipped with blackish brown; the hinder parts are indistinctly striped with greyish brown; the tail-feathers deep grey, the four outermost tipped with white, and decorated with a broad, black stripe, besides other more delicate lines. The eye is brown, the bare patch by which it is surrounded light scarlet, the beak yellowish grey, and the foot olive-brown. The female is somewhat smaller than her mate. The latter exceeds two feet in length; the wing measures thirteen, and the tail ten inches.

The Channel-bill, according to Gould, is a migratory bird in New South Wales, arriving in October and departing again in January; whither it proceeds is not known.

"This bird," says Latham, "is generally seen in the morning and evening, sometimes in small parties of seven or eight, but more often in pairs. Both on the wing and when perched, it makes a loud, screaming noise when a Hawk or other bird of prey is in sight. In the crop and gizzard the seeds of the red gum and peppermint trees have been found; it is supposed that these are swallowed whole, as the pericarp, or capsule, has been also found in the stomach; exuviae of beetles have also been seen, but not in any quantity. The tail, which is of nearly the length of the body, is occasionally displayed like a fan, and gives the bird a majestic air. The natives seem to know but little of its habits and haunts; they consider its appearance as an indication of blowing weather, and that its frightful scream is produced by fear. It is not very easily tamed, for Mr. White informs us that he kept one alive for two days, during which time it would eat nothing, but bit at every one who approached it very severely. The habits of this species are probably parasitic, for a young bird given me by Lady Dowling was one of two taken from a branch while being fed by birds not of its own species. The eggs I have seen were of a light stone-colour, marked all over, particularly at the broad end, with irregular patches of reddish brown; many of these were of a darker hue, and appeared as if beneath the surface of the shell."

A young *Scythrops* introduced into Dr. Bennett's aviary was, he tells us, "placed in a compartment already occupied by a *Dacelo gigantea*, or Laughing Kingfisher. Doubtless feeling hungry after its journey, it immediately opened its mouth to be fed, when its wants were regularly attended to by the *Dacelo*, which, with great kindness, took a piece of meat, and, after sufficiently preparing it by beating it about till it was in a tender state, placed it carefully in the gaping mouth of the young *Scythrops*. This feeding process was continued until the bird was capable of attending to its own wants. In the morning it used to perch on the most elevated resting-place in the aviary, occasionally raising itself, flapping its wings, and then quietly settle down again, after the manner of Hawks when in confinement, and presenting much the appearance of that tribe of birds."

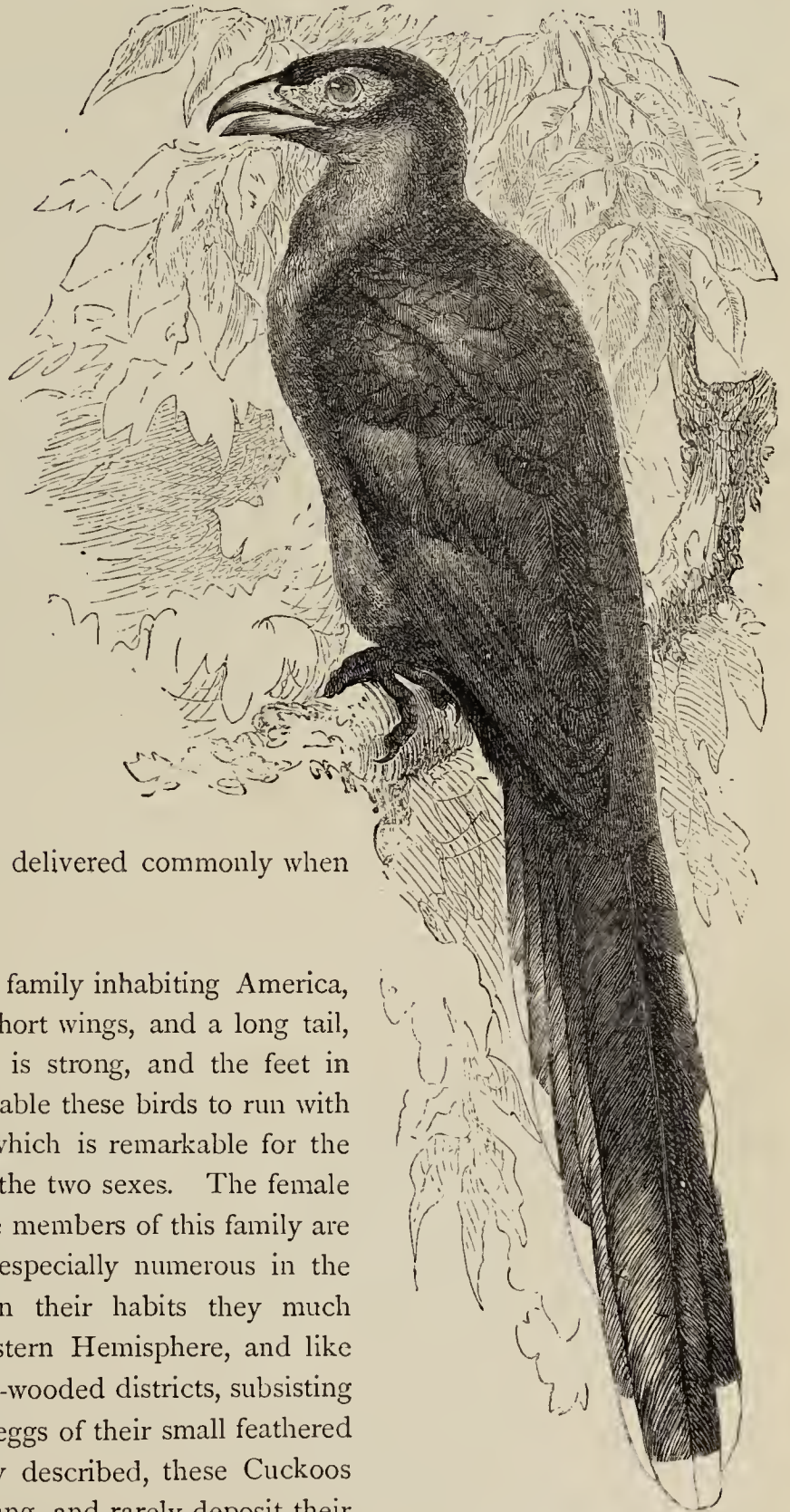
THE BUSH CUCKOOS (*Phœnicophæi*) possess a slender body, long tail, and small tarsi; the wings are short, the beak of moderate size and very powerful; the region of the eye is bare, and the magnificently tinted plumage of a hairy texture. These birds occupy India and the neighbouring islands, one species alone being met with in Africa. We are, unfortunately, but little acquainted with their habits, and as yet have only ascertained that they frequent the inmost recesses of the forests, and subsist upon insects.

THE KOKIL, OR LARGE, GREEN-BILLED MALKOHA.

The KOKIL, OR LARGE, GREEN-BILLED MALKOHA (*Zanclotomus tristis*), an Indian species, is recognisable by its compressed and curved beak, moderate-sized feet, short toes armed with sharp claws, small, rounded wings, and a long graduated tail; the mantle is deep greyish green, the head and nape of a pure grey; the quills and tail are shaded with green, the feathers of the latter tipped with white; the throat and upper breast are pale grey, the lower breast and an outer circle around the eye

white; the eye is deep brown, and the bare line by which it is surrounded a rich scarlet; the beak is apple-green, and foot greenish grey. This species is twenty-three inches long, the wing measures six inches, and the tail sixteen inches and three-quarters.

“This handsome bird,” says Jerdon, “is found in Lower Bengal, Central India, and the Northern Circars; also in the warmer valleys of the Himalayas. It extends to Assam, Burmah, and Malacca, where it is very abundant. I have usually seen it solitary, wandering about in the forests, and eating large insects—mantides, crickets, grasshoppers, and also large caterpillars. In Sikim it is only found in the warmer valleys, at a height of about 3,000 feet. The eggs brought to me at Darjeeling were two in number, pure white, and of a long oval form. I did not see the nest, but was told it was a large mass of stick and roots. I took a similar egg from the oviduct of a female I shot. Mr. Blyth remarks that the presence of the Malkoha is often betrayed by its voice, which is a low monosyllabic chuck, often repeated, and delivered commonly when the bird is perched on a tree.”



THE KOKIL, OR
LARGE GREEN-BILLED MALKOHA
(*Zanclostomus tristis*).

The RAIN CUCKOOS (*Coccyzi*), a family inhabiting America, possess a comparatively powerful body, short wings, and a long tail, composed of twelve feathers; the beak is strong, and the feet in some species so well developed as to enable these birds to run with ease upon the ground. The plumage, which is remarkable for the softness of its texture, is almost alike in the two sexes. The female is somewhat longer than her mate. The members of this family are met with in all parts of America, being especially numerous in the southern portion of that continent. In their habits they much resemble their representatives in the Eastern Hemisphere, and like them lead a retired life in forests and well-wooded districts, subsisting upon insects, hairy caterpillars, and the eggs of their small feathered companions. Unlike the groups already described, these Cuckoos build a nest for the reception of their young, and rarely deposit their eggs in another bird's abode.

THE RAIN OR YELLOW-BILLED CUCKOO.

The RAIN OR YELLOW-BILLED CUCKOO (*Coccyus Americanus*) represents a group of the above birds characterised by their thin, delicate, compressed, and pointed beak, which is slightly curved.

and almost equals the head in length. The feet are short, and wings long. The long graduated tail is composed of ten slender feathers. The plumage of the Rain Cuckoo is entirely of a light greyish brown above, and greyish white on the under side. The exterior quills are bordered with brownish orange, the tail-feathers black, tipped with white, the eye is deep brown, the upper mandible brownish black, and lower one of a yellow shade; the feet are blueish grey. This bird is twelve inches and a half in length; the wing measures five inches and a half, and the tail six inches and three-quarters.

"A stranger who visits the United States," says Wilson, "and passes through our woods in the month of May or June, will sometimes hear, as he traverses the borders of deep, retired, high-timbered hollows, an uncouth guttural sound or note, resembling the syllables 'kove, kove,' beginning very slowly, but ending so rapidly that the notes seem to run into each other. He will hear this frequently without being able to discover the bird or animal from which it proceeds, as it is both shy and solitary, always seeking the thickest foliage for concealment. This is produced by the Yellow-billed Cuckoo, which, from its cry, is known in Virginia as the Cow Bird. It is also called the Rain Crow, being observed to be most clamorous immediately before rain."

"The flight of this species," Audubon tells us, "is rapid, silent, and horizontal, as it moves from one tree to another, or across a field or river, and is generally continued amongst the branches of the trees in our woods. When making its way among the boughs, it occasionally inclines the body to either side, so as alternately to show its whole upper or under parts. During its southward migrations, it flies high in the air, and in such loose flocks that the birds seem to follow each other, instead of keeping together. On the other hand, the males arrive singly; the males coming first, and the females a few weeks after. They do not fly in a continued line, but in a broad front. This bird is not abundant anywhere, and yet is found very far north. I have met with it in all the low grounds and damp places in Massachusetts, along the line of Upper Canada, pretty high on the Mississippi and Arkansas, and in every State between these boundary lines. Its appearance in the State of New York takes place before the beginning of May, and at Green Bay not before the middle of that month. A pair here and there seem to appropriate certain tracts to themselves, where they rear their young in peace and plenty. The Yellow-billed Cuckoos feed on insects, such as caterpillars and butterflies, as well as on berries of various kinds, evincing a special predilection for the mulberry. In autumn they eat many grapes, and I have seen them supporting themselves by a momentary action of their wings opposite a bunch, selecting the ripest, when they would seize it and return to a branch, repeating their visits in this manner till satiated. They will also now and then descend to the ground to pick up a wood-snail or a beetle. They are extremely awkward at walking, and move in an ambling manner, or limp along sideways, a clumsiness for which their short legs are an ample excuse. They are seldom seen perched conspicuously on a twig; but, on the contrary, are generally to be found among the thickest boughs and foliage, where they emit their notes until late in the autumn, after which they are discontinued. The nest is simple, composed of a few dry sticks and grass, formed much like that of the Common Dove, and like it fastened to a horizontal branch, often within the reach of man. The bird would appear to make no particular selection as to situation or the nature of the tree, but settles anywhere indiscriminately. The eggs are four or five, of an oval form, and of a bright green colour. Only one brood is reared in the season, unless the first is removed or destroyed. According to Brewer the female commences sitting as soon as her first egg is deposited, it being no uncommon occurrence to find fresh-laid eggs and others containing almost fully developed young in the same nest. At first the young are principally fed on insects. Towards autumn they become very fat, and are fit for being eaten; few people, however, shoot them for the table, excepting the Creoles of Louisiana."

THE RAIN BIRD.

The RAIN BIRD (*Saurothera vetula*) is remarkable for the very peculiar formation of its long, thin beak, which is almost straight, compressed at its edges, and hooked at its tip. The tarsi are short and slender, the toes long and meagre; the wings, in which the fourth, fifth, and sixth quills are the longest, are of moderate size; and the long, graduated tail is composed of ten rounded feathers. The plumage upon the entire mantle is dark grey, and the under side reddish yellow, shading into light grey on the breast, and into yellowish grey on the lower part of the belly. The ten exterior quills are light brownish red, tipped with greenish brown; the centre tail-feathers are grey, shaded with green; while those on each side are blackish brown, tipped with white. The eye is nut-brown, and the circle by which it is surrounded light scarlet; the beak is blackish, and foot blueish black. The length of this bird is fifteen inches and a half, and its breadth fourteen inches. The wing measures four inches and a half, and its tail six inches and a quarter.

We are informed by Mr. Gosse that "the Rain Bird—sometimes called the 'Tom Fool,' from its silly habit of gratifying its curiosity instead of securing its safety—is little seen except where the woods are high; but it is widely scattered in mountain as well as in lowland. This species is seldom seen to fly, except from tree to tree, more usually leaping in a hurried manner along the branches, or proceeding up the perpendicular bole by short jumps, pausing from time to time to gaze at any intruder, and if driven away flying only a few yards and again peeping as before. When it flies, it generally glides nearly in a straight line, without flapping the wings. It often sits on a branch in a remarkable posture; the head lower than the feet, and the long tail hanging nearly perpendicularly down. When sitting it now and then utters a loud and harsh cackle, unvarying in note, but increasing in the rapidity of its emission. Sometimes this sound is produced during its short flight. All the time of this effusion the beak is held wide open. It may be imitated by repeating the syllables 'ticky, ticky, ticky,' as fast as they can be uttered. The Rain Bird is frequently seen on the ground in morasses and woods, when it proceeds by a succession of bounds, the long tail held somewhat high, and the head low; the tail is jerked forward by the impulse of each pause of motion, and the whole action is like that of the *Crotophaga*. If held it becomes very fierce, trying with widely-opened beak and expanded tail, to bite, and uttering angry screams. A male that had been knocked down with a stone, on being put into a cage, was outrageous when one's hand was placed near the wires; darting from side to side, now and then snapping at the hand, and snarling all the while, in the tone of an angry puppy. This bird is extremely retentive of life. Sometimes, when a wounded one has come into my possession, I have been distressed at the vain efforts I have made to deprive it of life. In various individuals that I have opened, I found large caterpillars, locusts, phasmata, spiders, phryni-spiders, and, upon one occasion, a whole mouse. Robinson found in one a large green anolis, six inches long, coiled up in a spiral manner, the head being in the centre. He states that it bruises the heads of lizards, and then swallows them head foremost. Mr. Hill kept a Rain Bird for several weeks. It seized cockroaches and other insects when put into its box, and ate fresh meat if chopped small. I have been able to ascertain nothing of the nest, except what the following note may afford:—A young friend informs me that he once observed a Rain Bird carrying 'trash' into the hollow or fork of the divergent limbs of a logwood-tree. Some little while after, passing that way, he observed a nest-like accumulation of similar substances; but as it was beyond reach, he took a long stick to poke it out. In doing so, he pushed out an egg, which was white, with many spots. 'When pairing,' observes Mr. Hill, 'the male bird attracts the female by gracefully displaying his feathers. The long, graduated tail is expanded, the short wings are spread, and the whole plumage is in motion, as the male endeavours, by playful dalliance, to win his mate's attention.'"

The LONG-TAILED CUCKOOS (*Pyrrhococcyx*) possess a comparatively slender body, and an elongate, slightly-arched, and hooked beak. The legs are strong, the tarsi slender, and the toes of medium size. The wings, in which the fifth quill exceeds the rest in length, are long. The long tail is composed of ten feathers, slightly rounded at their extremities. The plumage is thick, and unusually downy.

THE LONG-TAILED CUCKOO.

The LONG-TAILED CUCKOO (*Pyrrhococcyx Cayanus*), a well-known member of the above group, is of a light reddish brown over the mantle, and from the breast downwards of a deep grey; the tail-feathers are dark reddish brown above, and black beneath, with white tips. The length of this species is from eighteen to twenty-two inches, according to the size of the tail; the span of the pinions is seventeen inches, their length from five inches and a half to six inches and a half, and the tail from ten to fourteen inches.

This Cuckoo, according to Burmeister, is spread over all the warm portions of America; and in Brazil, where it is very common, comes constantly down into the fields and gardens. Its flight, despite the shortness of the wings, is free and easy; its disposition brisk and active; and its call-note an oft-repeated, penetrating cry. These birds usually live in pairs, but frequently associate in parties while in pursuit of their insect prey. We have no reliable information as to the breeding of this species.

The TICK-EATERS (*Crotophagæ*), a small but remarkable family, inhabiting Southern and Central America, possess a slender body and very decidedly arched beak, powerful feet, with the toes placed in pairs, moderate-sized wings, and a long, broad, rounded tail, composed of eight feathers. The thick, small-feathered plumage is of sombre hue, and takes the form of bristles in the region of the beak; the cheek-stripes and region of the eyes are bare.

“These birds,” says Brown, in his “History of Jamaica,” “prefer cultivated places, and more especially land in the neighbourhood of pastures or low shrubberies and swamps. They easily make their way amongst the thickest foliage or grass, by means of their sharp-edged bills, with which they scatter the herbage on each side, in search of grasshoppers and other insects. They have been seen on the dead carcase of a sheep, but whether attracted by the flesh or by the larvæ of insects is uncertain. In the day-time they often associate in flocks of twenty or thirty individuals near small rivulets, seeking for tadpoles, which they greedily devour. At other times they may be seen flying from shrub to shrub, uttering their peculiar note. They live chiefly upon ticks and other small vermin, and constantly jump about cows and oxen in the fields, and the cattle will frequently lie down to benefit by their good offices, if much infested by ticks; but if the beast appear heedless of their proffered attentions, they hop once or twice around it, looking it very earnestly in the face every time they pass, as if they knew it was only necessary for them to be seen to be indulged. They are very noisy birds, and very common in all the pastures of Jamaica. The nests of the Tick-eaters are built in the fork of a tree, or in a bush covered with mistletoe, and made rudely of some coarse materials, chiefly small sticks, totally destitute of any soft lining. The eggs are from five to seven or more in number. The young evince much activity in hopping from branch to branch; long before they are able to fly they leave their nests, and may be seen perched on the top of a shrub or thicket of vines, in company with a congregation of adult birds. When the parents escape from an intruder by taking flight, the young, by long and rapid leaps, reach the ground, and run off very quickly.”

The TRUE TICK-EATERS (*Crotophaga*) have a slender body, small head, short wings, long

tail, and high tarsi. The high, much-raised beak is sharp at its margin, and very decidedly hooked at its tip. The outer toe of the high, powerful foot is twice as long as the innermost, whilst the toe that turns backwards is of equal size with the real hinder toe.

THE COROYA.

The COROYA (*Crotophaga major*) is about the size of a Jay, but more slender, and possessed of a far stronger beak; the latter is longer than the head, and slightly hooked at its extremity; the sides of the bill are not so compressed as in other species; the feathers on the head and nape are very long and pointed, while those on the breast are very broad. The plumage is of a deep steel-blue, shading into violet on the tail and on the breast. The eye is bright light green, its iris surrounded by a narrow circle of yellow; the beak and bare skin about the eye are black, and the feet blackish brown. This species is eighteen inches and two-thirds long, and twenty-two inches and a quarter broad; the wing measures seven inches and two-thirds, and the tail nine inches and five-sixths. The female is not quite so large.

THE ANI, OR SAVANNA BLACKBIRD.

The ANI, or SAVANNA BLACKBIRD (*Crotophaga ani*), is scarcely larger than the Common Cuckoo. The beak of this bird equals the head in length, and the raised portion of the bill extends over the whole of the upper mandible, which terminates in a decided hook. The entire plumage is blueish black, the feathers on the fore part of the body being enlivened by a violet gloss. The eye is grey, the beak and feet black. The length is thirteen inches and a half, and breadth fifteen inches and a half; the wing measures five inches, and the tail six inches and two-thirds.

“In all open places, particularly savannas which are occupied by cattle or horses,” says Gosse, “these birds are seen all day long and all the year round. Familiar and impudent, though very wary, they permit a considerable acquaintance with their manœuvres, while an approach within a limited distance in a moment sets the whole flock upon the wing, with a singular cry, which the negroes please to express by the words ‘going awa-a-y,’ but which may as well be described, according to the fancy of the hearer, as ‘how d’ye,’ or ‘ani.’ The appearance of the bird in its gliding flight is unusual, as in flying it assumes a perfectly straight form, with the long tail in the same line, without flapping the wing, so that it takes the aspect, on a side view, rather of a fish than of a bird. The food of this species, though consisting entirely of insects, is not confined to them; the stomach is usually distended with caterpillars, moths, grasshoppers, and beetles to such a degree that it is wonderful how the mass can have been forced in. I have found these contents mixed up with and stained by the berries of the snake-withe, and in July I have found the stomach crammed with the berries of the fiddle-wood (*Cytharaxylon*), which had stained the whole inner surface bright crimson. Flocks of these birds were at that time feeding on the glowing clusters, profusely ripe, upon the trees. Stationary insects are their staple food; to obtain these they hop about grassy places, and are often seen to jump or run eagerly after their prey, on which occasions the long tail, continuing the given motion after the body has stopped, is thrown forward in an odd manner, sometimes nearly turning the bird head over heels. It is probably to protect the eyes from the stalks of weeds and blades of grass, in these headlong leaps, that the projecting brows are furnished with a row of very short but stiff bristles; but what purpose was served by the thin and high knife-blade of a beak I was ignorant till informed by Mr. Hill that it enables the bird to open out the soft earth and seek for its insect food; it also facilitates its access to the vermin imbedded in the long hair of animals.” “I am assured,” he adds, “that if a patch of cow’s dung be examined after *Crotophagæ* have been searching for the larvæ of insects, it will be found furrowed, as if a miniature plough had passed through it. The name of

Crotophaga (Tick-eater) is no misnomer, as has been asserted by some who never saw the living bird; almost every one in Jamaica is aware that the Savanna Blackbird feeds on the parasites of cattle. Stationary insects are, however, by no means the only prey of the *Crotophaga*. In December I have seen little groups of them engaged in the evenings leaping up from the pasture about a yard into the air, after flying insects, which they seemed to catch. Upon one occasion I saw that one of these birds had actually made prey of one of our little nimble lizards (*Anolis*). Though its usual mode of progression on the ground is by hopping, or rather bounding, the feet being lifted together, this Blackbird is seen to run in a headlong manner for a short distance, moving the feet alternately. He



THE ANI, OR SAVANNA BLACKBIRD (*Crotophaga ani*).

is fond of basking in the morning sun, or in a low tree, with the wings expanded, remaining perfectly still for a considerable time. In the heat of the day, in July and August, many may be seen in the lowland plains, sitting on the fences and logwood hedges, with their beaks wide open, as if gasping for air; at these times they forget their usual loquacity and wariness. Often two or three will perch in the centre of a thick bush overhung with a matted drapery of convolvulus, whence they utter their singular cry, in a calling tone, as if they were playing at hide-and-seek, and requesting their fellows to come and find them. The statement that this Blackbird builds in company, forming an immense nest of basket-work by the united labours of the flock, is universally maintained by the inhabitants of the colony. This nest is said to be usually placed in a high tree, where many parents bring forth and educate a common family. Mr. Hill, whose statements on Jamaican ornithology are worthy of unlimited confidence, observes, 'Some half-dozen of them together build but one nest, which is large and capacious enough for them to resort to in common and rear their young together. They are

extremely attentive to the business of incubation, and never quit the nest while sitting without covering the eggs with leaves, to preserve them at an equal temperature.’” “The only instance I ever met with,” continues Gosse, “while not conclusive, is rather in favour of this opinion than opposed to it. In July I found a Blackbird’s nest in a Bastard Cedar (*Guazuma*); it was a rather large mass of interwoven twigs, lined with leaves, eight crimson eggs were in the nest, and the shells of many more broken, and scattered beneath the tree. The eggs were about as large as a pullet’s,



THE WRINKLED-BEAKED TICK-EATER (*Crotophaga rugirostris*).

very regularly oval, of a greenish blue, but covered with a coating of white chalky substance, which was much scratched and eroded on them all, and which was displaced with but little force.”

THE WRINKLED-BEAKED TICK-EATER.

The WRINKLED-BEAKED TICK-EATER (*Crotophaga rugirostris*) is somewhat larger than the Ani; its beak is also longer, and covered with four or five wrinkles or ridges. The plumage is of a dull blueish black; the feathers on the head, throat, and upper breast are edged with violet, and those of the back and belly bordered with a rich metallic green. The eye is greyish brown, the

beak and feet are black. This species is fourteen inches long, the wing measures six, and the tail seven inches.

The COUCALS, or SPURRED CUCKOOS (*Centropodes*), a family of strange birds inhabiting Africa, the East Indies, New Holland, and the Malay Islands, possess a very powerful, short, and much-curved beak, which is compressed at its sides; the tarsi are high, and toes comparatively short; the hinder toe is usually armed with a very long and almost straight spur-like claw; the wings are short and rounded, and the tail (composed of ten feathers) graduated, and either of moderate size or very long. The extremely harsh plumage is similarly coloured in both sexes; the young differ in a striking manner from their parents, and only acquire the same hues as the adults in the third year.

The Coucals frequent thick brushwood, cane plantations, and pasture land, and penetrate the densest masses of vegetation with surprising dexterity, in pursuit of the scorpions, snakes, lizards, insects, and birds' eggs, upon which they principally subsist. Their powers of flight are so limited as only to be employed in cases of extreme danger. The voice consists of various deep sounds, some of which seem produced by ventriloquism. The nests built by this family are carelessly formed, and placed among bushes or canes, or in long grass; in some instances, however, more care is evident in their construction, the upper portion being provided with a cover, and two entrances made in the side, the one for entrance and the other for egress. The brood consists of from three to five white eggs, which are hatched by the united efforts of both parents. The young, when first produced, are remarkably ugly.

THE EGYPTIAN COUCAL.

The EGYPTIAN COUCAL (*Centropus Ægypticus*), a species inhabiting Africa, possesses a comparatively short tail, and plumage of a reddish brown tint; the head and nape are black, the back and wings chestnut-brown; the tail-feathers greenish black, bordered with white; and all the lower portions of the body of a fallow-grey. The eye is bright purple, the beak black, and foot deep brownish grey. This species is fourteen inches long and sixteen and a half broad; the wing, in which the sixth quill exceeds the rest in length, is five inches and a half, and the tail seven inches and a half.

The Egyptian Coucal is commonly met with in some parts of Egypt, and is by no means rare in other portions of North-eastern Africa; everywhere it frequents the dense woods and forests, or extensive beds of reeds, penetrating the densest thickets with all the wonderful dexterity of the Mouse Birds. Unlike most members of the family, this species leads an indolent and quiet life, frequently perching motionless at the summit of its bushy fastnesses, or hovering over their surface, while watching for its insect prey. Ants, we are told, it frequently consumes in such quantities as to impart a most revolting odour to its body. Like its congeners, the adult Spurred Cuckoo is always met with in company with its mate; while the young, on the contrary, often lead a solitary life for several years before pairing. The nest found by ourselves in the Delta was placed in the bushy crown of an olive-tree, and almost entirely constructed of the husks of maize; the young contained therein were partially fledged, the time of year being the month of June. We could not succeed in obtaining an egg. This Coucal is but seldom captured by the natives, owing to the impracticable nature of its favourite haunts and the uninviting savour of its flesh. We have but once seen it caught.

The CROW PHEASANTS (*Centroccyx*), an Indian group of the above birds, are recognisable by their long, graduated tail, and the black markings on the reddish brown wings.

THE HEDGE CROW.

The HEDGE CROW (*Centrococcyx viridis*) is of a glossy greenish black on the head, nape, upper tail-covers, tail, and entire under side; the back and quills being nut-brown, the latter tipped with bright red. According to Swinhoe, this bird undergoes three changes of plumage, and is during the first year of a light reddish hue, striped with black on the mantle, and white marked here and there with red on the under side. In the second year the feathers on the mantle are brown, with ochre-yellow lines on the shafts; the tail is blackish green, spotted with a reddish shade; the under side of light brownish yellow, each feather striped and spotted with brown; the quills are red, with brown markings. The eye is red, the beak black, and the foot lead-grey. This species is fifteen inches long, the wing measures six inches and a half, and the tail eight inches.

The *Centrococcyx viridis* is extensively met with throughout India, and in the surrounding islands. In the former country it principally occupies the jungles, in Java low brushwood, and in Formosa such portions of woods or forests as abound with creeping plants. According to Bernstein, it is quiet and solitary in its habits, keeping principally within the shelter of the bushes, and rarely betraying its presence except by the utterance of its very weak cry, which nearly resembles that of the common European Cuckoo. If alarmed, the bird endeavours to escape by running, instead of flying; and only takes to its wings if very sorely pressed, when it flies direct to the interior of the nearest bush. The nests we have seen were most carelessly constructed of the leaves of the alang-alang, and placed either close to the ground, amongst grass and stubble, or between the branches of a low shrub. The eggs we found were usually two or three in number, and had a white and slightly glossy shell; in some instances two of the eggs were large, while the third was comparatively of very small size. We were unable to ascertain what share the female takes in the duty of incubation, as whenever we watched the nests during the day the male bird was always seated thereon. The nestlings at first present a very ridiculous appearance, as their skin is black, and their back and head covered with stiff, hairy, or, more strictly, bristle-like feathers; add to this that their tongue is bright orange, tipped with black, and it may be imagined that the first sight of a nestful of these gaping youngsters somewhat astonishes an uninitiated observer.

The PHEASANT COUCALS (*Polophilus*), as the Australian representatives of this family are called, are recognisable by their comparative size, and the formation of their short, thick, strong, and decidedly-curved beak.

THE PHEASANT COUCAL.

The PHEASANT COUCAL (*Polophilus phasianus*) has the general plumage of a dull black, and the wing-covers fallow-brown and black, each feather being marked with a light line upon the shaft; the quills are chestnut-brown, with a double line of black; and the tail-feathers dark brown, with a greenish gloss, and delicately marked with red spots. All the tail-feathers, except those in the centre, are tipped with white. The eye is red, the beak black, and the foot greyish black. In the young birds the back is reddish brown, and the under side fallow-grey; in other respects the plumage resembles that of the adult birds. This species is twenty-four inches long, the wing ten, and the tail twenty-four inches.

“The greater part of the road-line of New South Wales, and the eastern, northern, and north-eastern portions of Australia,” writes Gould, “are generally tenanted by these birds, but only in such situations as are favourable to their habits, namely, swampy places among the brushes, abounding with tall grasses and dense herbage, among which they run with facility, and, when necessity prompts, fly

to the lower branches of the trees, from which they ascend in a succession of leaps from branch to branch, until they nearly reach the top, whence they fly off to a neighbouring tree. The most western part of New South Wales in which I have heard of their existence is Illawarra, where they are rare, and from whence to Moreton Bay they gradually increase in numbers. The nest, which is placed in



THE PHEASANT COUCAL
(*Polophilus phasianus*).

a tuft of grass, is of a large size, composed of dried grasses, and is of a domed form, with two small openings, through one of which the head of the female protrudes while sitting, and her tail through the other. At Port Essington the nest is some-

times placed among the lower leaves of the pandanus, but this occurrence seems to be rare, a large tuft of long grass being most frequently selected, as affording better shelter. The eggs are from three to five in number, of a dirty white hue, and nearly round; in some instances they are stained with brown, and have a rough surface, somewhat like the eggs of the Cormorant."

The BARBETS (*Capitones*) possess a strong, conical beak, of moderate size, and much compressed at its tip; short and powerful feet, with the toes placed in pairs; small or medium-sized wings, rounded at their extremity, and a comparatively long tail. The plumage, which is most resplendent, is replaced by bristles in the region of the beak. The members of this family are spread over Asia and Africa, and are brisk and lively birds, associating freely with their congeners, and busily seeking the berries, fruits, and insects, upon which they subsist, from bush to bush and tree to tree, rarely or never descending to the ground. Their flight is rapid, but not sustained to any great distance, owing to the weight of their bodies; almost all have loud, resonant voices, while some species utter something resembling a regular song. The nests of the Barbets are placed in hollow

trees, or holes in the ground, but, except this, and the fact that the eggs are white, we are entirely without particulars as to their manner of incubation.

THE PEARL BIRD.

The PEARL BIRD (*Trachyphonus margaritatus*) represents an African group, possessing a moderate-sized and slender beak, which is slightly arched, and compressed at its tip; the comparatively high feet have the tarsi longer than the centre toe; the fourth quill of the moderately long



THE PEARL BIRD (*Trachyphonus margaritatus*).

wing exceeds the rest in length; the tail is of medium length, and rounded at its extremity. The plumage of the back is brown, spotted and marked with white, that of the under side bright glossy yellow, shading into red on the breast; the brow, crown of the head, and, in the male bird, a chain of spots upon the breast, are black; the rump and vent are deep bright red. The eye is dark red, the beak light red, and the foot lead-grey. This species is seven inches long, the wing measures three inches and a half.

We have frequently met with these beautiful birds in most parts of North-eastern Africa, where they constantly visit the fields and gardens near the settlements, making themselves particularly conspicuous during the early morning and in the evening, by flying around the tops of the loftiest trees, or by pouring forth their deep but lively notes with an animation that gives the performance almost the effect of a pleasing song. The food of this species consists of seeds, fruit, and insects, in

pursuit of which it displays but little skill while climbing about the branches ; its flight consists of a hovering, whirring motion, and is seldom long sustained. The oval, pure white eggs obtained by Heuglin, on the 26th of September, were found in holes situated in the side of a bank of earth ; in one instance the interior had no lining of any description, and in the other a mere bed of reeds, on which the eggs were deposited. We are unable to state whether these holes are excavated by the parent birds.

THE GOLDEN BARBET.

The GOLDEN BARBET (*Xantholæma Indica*) represents a group characterised by their short beak, bulging outwards at its sides, slightly-pointed wings, in which the third, fourth, and fifth quills are the longest, and a short, almost straight tail. The plumage of the mantle is green, that of the under side yellow, or greenish white ; the feathers on the back and wing-covers are bordered with yellow, and those on the breast striped with green. The brow and a spot on the throat, are glossy scarlet, the latter edged with gold at its lower portion ; a band at the nape, the breast, and a stripe upon the chin are black. The eye is deep brown, the beak black, and the foot bright red. The length of this bird is six inches and a half, and its breadth eleven inches ; the wing measures three inches and a quarter, and the tail one inch and a half.

“This species of Barbet,” writes Jerdon, “is found throughout all India, extending into the Burmese countries, Malayana, Ceylon, and the isles ; according to Adams, it is not met with in the Himalayas or in the Punjaub. This bird is very common wherever there is a sufficiency of trees, inhabiting open spaces in the jungles, groves of trees, avenues, and gardens, being very familiar, and approaching close to houses, and not unfrequently perching on the housetop. As far as I have observed, it does not climb like the Woodpecker, but hops about the branches like other perching birds. The Rev. Mr. Philips, however, states that it runs up and down the trees like a Woodpecker, and other observers have asserted that it climbs to its hole ; but I confess I have never seen this, and Mr. Blyth is most decidedly of opinion that Barbets never climb. The latter naturalist found that one of these birds which he kept alive would take insects into its mouth and munch them, but swallowed none, and forsook them immediately when fruit was offered. It has a remarkably loud note, which sounds like ‘took-took-took,’ and this it generally utters when rested at the top of some tree, putting its head at each call first on one side and then on the other. Sundevall states that the call is like a low note on the flute, from the lower G to the second E. This sound, and the motion of the head accompanying it, have given origin to the name ‘Coppersmith,’ by which this species is known both by natives and Europeans. The sound often appears to come from a different direction to that from which it does really proceed ; this appears to me to depend on the direction of the bird’s head. Mr. Philips accounts for it by saying that it alters the intensity of its call. Sundervall remarks that ‘the same individual always utters the same note, but that two of these birds are seldom heard to make it alike.’ When, therefore, two or more individuals are sitting near each other, a not unpleasing music arises from the alternation of the note, each sounding like the tone of a series of bells. The Crimson-breasted Barbet breeds in holes of trees, laying two or more white eggs. A pair bred in my garden at Saugor on the cross-beam of a vinery. The perfectly circular entrance was on the under side of the beam. This nest appeared to me to have been used for several years, and the bird had gone on lengthening the cavity year by year, till the distance from the original entrance was four or five feet ; another entrance had then been made, also from below, about two feet and a half from the nest. Quite recently I discovered a nest built by this bird in a hole of a decayed tree-branch, close to a house in a large thoroughfare in Calcutta.” The Golden, or Crimson-breasted Barbet, as it is sometimes called, subsists upon the fruit of various plants, but, according to Blyth, has also been known to eat animal food. The eggs are white, and two or more in number.

THE TOUCAN BARBET.

The TOUCAN BARBET (*Tetragonops ramphastinus*), an American species, may be regarded as the connecting link between the Barbets and Toucans. In these birds the powerful beak is square at its base, and the lower mandible forked at its extremity in such a manner as to receive the hook in which the upper portion of the bill terminates; the wings and tail are both of moderate size, and the latter much graduated; the head, a band on the nape, the wing-covers, and tail are black; the upper portion of the tail is brownish grey, and its lower part of a yellowish hue; the throat is adorned by a triangular white spot; the throat and sides of the belly are grey, and a line dividing the former from the latter bright scarlet; the centre of the breast is a rich fiery red. The eye is yellowish; the beak yellow at its base and black at its tip; the feet are deep grey. This species is eight inches and a quarter long; the wing measures four inches and the tail three inches and three-quarters. We are entirely without particulars concerning this beautiful bird, except that it inhabits Ecuador.

The HORNBILLS (*Bucerotidæ*) are remarkable for the unusual size of their bills, which are frequently so large as to appear almost a deformity; in many species this effect is increased by a singular, helmet-shaped excrescence at the base of the beak. The whole structure, which appears so ponderous, is in reality very light, being composed of an outer case, supported by a bony net-work filled with air; so delicate is this helmet-like protuberance in some species, that after the death of the bird it may readily be crushed with the thumb and finger. In shape this remarkable beak is long, curved, and pointed; the margins of the upper mandible are often irregularly incised. The feet, which are stout and powerful, have the anterior toes more or less united.

The TOUCANS (*Ramphastidæ*) are a numerous race of South American birds, at once recognisable by the prodigious size of their beaks, and by the richness of their plumage.

“These birds,” says the Prince von Wied, in some notes communicated to Mr. Gould, “are very common in all parts of the extensive forests of the Brazils, and are killed in great numbers during the cool seasons of the year for the table. To the stranger they are even of greater interest than to the native, from their remarkable form, and from the rich and strongly-contrasted style of their colouring, their black or green bodies being adorned with markings of the most brilliant hue; red or orange, blue, and white; their naked orbits in some instances red, and in others green or blue; the naked parts of the body dyed with brilliant colours, the legs blue or green, and irides blue or yellow; the large bill of a different colour in every species, and in many instances very gaily marked. The colouring of the soft parts is, however, so evanescent that to determine the species with accuracy they must be depicted during life, or immediately after the birds are killed. Common as these birds are in their native land, it is extremely difficult to detect their breeding-places; it is, however, certain that they deposit their eggs in the hollow limbs and holes of the colossal trees so common in the tropical forests, but I was never fortunate enough to discover them. The stomachs of those I examined contained nothing but the remains of fruit, principally of the softer kinds, for which, indeed, they have such a liking that they resort in great numbers to the plantations in the vicinity of their native haunts, and commit fearful havoc among their favourite delicacies: I was informed, that they frequently steal and eat young birds, but no instance of their doing so came under my own observation. Mr. Waterton’s opinion agrees with mine, but Azara, among others, states that they also feed upon animal substances. The specimens we saw in a state of domestication were very voracious, and perfectly omnivorous; but they seem to be purely frugivorous in a state of nature, a fact which was fully confirmed by the Brazilian natives we questioned on the subject. In their manners the

Ramphastidæ offer some resemblance to the *Corvidæ*, and, like them, are very troublesome to birds of prey, particularly to the Owls, which they surround and annoy by making a great noise, all the while jerking their tails upwards and downwards. The flight of these birds is easy and graceful, and they sweep with facility over the loftiest trees of their native forests; their strangely-developed bills are no encumbrance to them, as the interior being replete with a tissue of air-filled cells renders these organs very light and even buoyant. The voice of the *Ramphastidæ* is short and unmelodious, and



THE ARASSARI (*Pteroglossus aracari*).

somewhat different in every species. Their feathers are used by the natives for general decoration, especially the yellow breasts of the birds, which they affix to their heads on each side, near the temple, and also to the ends of their bows."

The ARASSARIS (*Pteroglossus*) possess a comparatively small, slender, rounded beak, which is compressed at its tip, equals the head in height, and is more or less incised at its margins. The short wing, in which the third quill is the longest, is pointed, and the tail long and conical. The plumage usually exhibits a great variety of colours, amongst which, however, green or yellow predominate. In some species the females differ considerably in appearance from their mates.



Plate 20. Cassell's Book of Birds

PHAROMACRUS ANTISIANUS _____ BEAUTIFUL TROGON

(about one half Nat. size)

THE ARASSARI.

The ARASSARI (*Pteroglossus aracari*), a native of Brazil, is principally of a deep metallic green; the throat and head are black, the cheeks shaded with brownish violet, and the lower breast and belly pale greenish yellow; the rump, and a line along the centre of the belly, are red; the tail is blackish green above and greyish green beneath. The eye is brown, the bare places round the eyes are

THE TOCO TOUCAN (*Ramphastus toco*).

greyish black, the upper mandible is yellowish white, with black culmen and mouth-corners, while the lower portion of the bill is black, edged with white; the legs are greenish grey. This species is seventeen inches long; the wing measures six, and the tail six and a half inches.

The Arassari, as we learn from the Prince von Wied, inhabits the primitive forests of Brazil, and closely resembles the Toucan in its habits; during the period of incubation it lives in pairs, but at other seasons in small parties, which fly over the face of the country in search of the fruits upon which they mainly subsist. Their flight, which resembles that of the Toucan, is undulatory and very rapid. When perched on the summits of high trees, they constantly repeat the two short notes that form their cry, and whisk with the tail after the manner of the Common Jay. The nest is made in a

hollow tree, and contains two eggs. Towards many birds of prey, especially Owls, the Arassaris exhibit much hostility, and frequently assemble to harry and annoy them as they sit droning away the bright hours of daylight. The flesh of this species is good food, and they become very fat during the winter. Burmeister, who affirms that the Arassaris do not confine themselves to a fruit diet, but freely eat insects and beetles, describes their appearance and movement among the trees as closely resembling those of a party of Parrots. Bates mentions that on one occasion, when descending a gully, having fired at one of these birds, as it sat apparently alone upon the bough of a lofty tree, he was much startled to find his victim's cry of pain answered by the simultaneous appearance of a large number of its terrified companions. In the twinkling of an eye every branch was occupied; and the birds, indignant at being thus roused from their repose, fluttered, shrieked, and flapped their wings like so many furies, in defiance of the unwelcome intruder. All attempts to capture any of the belligerents proved fruitless, for the cries of their dying associate had no sooner ceased than they retired as suddenly as they had appeared, and immediately ensconced themselves in some unseen but safe retreat within their leafy fastnesses.

The TOUCANS PROPER (*Ramphastus*) are at once recognisable by the extraordinary size of their curved beak, which is very thick at its base, compressed at its tip, and furnished with a sharp ridge at its culmen. The high, powerful legs are covered with large flat scales, the tarsi are short, and the toes long; the small, broad, rounded tail, is composed of feathers of equal length; the wings are short, and the fourth and fifth quills longer than the rest; a black gloss predominates in the coloration of the plumage, enlivened by red, white, or yellow patches on the throat, back, and wings. All the various species of these birds live in pairs, within the shade of the forest, only exceptionally congregating into small parties, and never venturing near the abodes of man.

THE TOCO TOUCAN.

The TOCO TOUCAN (*Ramphastus toco*) is principally of a glossy black; the throat, cheeks, lower throat, and upper tail-covers are white, and the rump light red. The large high beak is bright orange-red, shading to deep red at the culmen and towards the tip of the lower mandible; while the tip and edges of the upper portion of the bill are black, the eyes, cheek-stripes, and region of the temple bright red; the eyelids blackish blue, and the legs dark grey. The length of this bird is twenty-two inches; the wing measures eight inches and three-quarters, and the tail five inches and a quarter.

The Toco Toucan, as we learn from the Prince von Wied, is never found near the coast, but is plentiful in the interior of the province of Minas Geroes and Bahia. It is abundant in the southern parts of Brazil, in latitude thirty-two degrees south. Those observed in the neighbourhood of Bahia were very shy, the result of their having been repeatedly fired at by the inhabitants in defence of their fruit-trees, and to procure them for food; notwithstanding which, the desire to feed upon the oranges and guavas induced them to approach very near the town at the season when those fruits were ripening. Very pretty little powder-flasks are made of their large, finely-coloured bills. "M. Natterer," writes Gould, in his magnificent work on the *Ramphastidæ*, "who first met with this bird in the province of St. Paul, and afterwards on the coast of Goyay and Mattogrosso, on the banks of the Amazon and Upper Rio Branco, remarks that "it will probably be found on all parts of Brazil, and believes that the bird prefers woods adjoining sandy plains, for he more than once met with it in low steppes and coppices, where ripe fruits were to be found. We generally met with it in small families, and observed that the bill varied in length according to the age and sex of the bird; and that its note, resembling 'gr-r-ra,' was deeper than that of any other member of the family." Mr. Edwards tells us that he saw the nest of this species in the fork of a large tree over the water of the Amazon,

but we are of opinion that the nidification of this bird should be described by other observers before full reliance be placed on the assertion that it makes a nest, for the hollows of trees are the usual incubating places of all the Toucans.

THE KIRIMA, OR RED-BILLED TOUCAN.

The KIRIMA, OR RED-BILLED TOUCAN (*Ramphastus erythrorhynchus*)—see Coloured Plate XXVI.—a very similar, but more slenderly-built species, is a beautiful bird inhabiting North America. It has a scarlet beak, with yellow base and culmen, a broad red band on the white throat, and a yellow rump.

In its general habits and manners the Red-billed Toucan resembles the rest of its congeners, leaping lightly from branch to branch among the topmost foliage of the lofty trees of its native forests. Mr. Waterton states that the native name is *Bouradi*, signifying “nose;” that it frequents the mangrove-trees on the sea-coast, and is never seen in the interior till you reach Mackonochia, where it is found in the neighbourhood of the river Tucuton. It feeds entirely on the fruits of the forest, and never kills the young of other birds or devours carrion. The sound the Bouraki makes is like the clear yelping of a puppy-dog; you might fancy it said “pia-po-o-co.” Thus the Spaniards calls this species Piapoco. It lays its eggs in the hollows of trees. Although Mr. Waterton states that the Red-billed Toucan lives entirely on fruits in its native wilds, it exhibits the utmost partiality to animal food when in a state of captivity, as shown by W. J. Broderip, Esq., in an account given by him of a specimen he examined at a bird-dealer’s in St. Martin’s Lane. “After looking at the bird, which was apparently in the highest state of health,” says that gentleman, “I asked the proprietor to bring up a small bird, that I might see how the Toucan would be affected by its appearance. The dealer soon returned, bringing with him a last year’s Goldfinch. The instant he introduced his hand, holding the Goldfinch, into the cage of the Toucan, the latter, which was on a perch, snatched it with his bill. The poor little bird had only time to utter a short weak cry, for within a second it was dead, killed by compression on the sternum and abdomen, and that so powerful that the bowels protruded after a very few squeezes with the Toucan’s bill. As soon as the Goldfinch was dead the Toucan hopped with it in his bill to another perch, and placing it between his right foot and the perch, began to strip off the feathers with his beak. When he had plucked away most of them, he broke the bones of the wings and legs with his bill, taking the wings therein, and giving at the same time a strong lateral wrench. He continued this work with great dexterity till he had almost reduced the bird to a shapeless mass; and ever and anon he would take his prey from the perch in his bill, and hop from perch to perch, making, at the same time, a peculiar hollow, chattering noise, at which times I observed that his wings and bill were affected with a vibratory or shivering motion, though the former were not expanded. He then returned the bird to the perch, and having set his foot on it, ate first the viscera, and then continued pulling off and swallowing piece after piece, till the head, neck, and part of the back and sternum, with their soft parts, were alone left; these, after a little more wrenching, he at last swallowed, not even leaving the wings or legs. It was clear to me that he felt great enjoyment, for whenever he seized his prey from the perch he appeared to exult, now masticating the morsel with his toothed bill, and applying his tongue to it, now attempting to gorge it, and now making the peculiar chattering noise, accompanied by the shivering motion above mentioned. The whole operation lasted about a quarter of an hour. He then cleaned his beak, by rubbing it against the bars of his cage. I have more than once seen this bird return the food from his crop, sometimes twice after he had taken it, and after masticating the morsel awhile in his bill, again swallow it, the whole operation, particularly the return of the food to the bill, bearing a strong resemblance to the analogous action in ruminating animals. His food consisted of bread, boiled vegetables, eggs, and flesh; to which a little bird is added every second and third day. He shows a

decided preference for animal food, picking out all morsels of that description, and only resorting to vegetable diet when all the other is exhausted.

“There is yet another peculiarity of this bird,” continues Mr. Broderip, “that cannot be passed over in silence. When he settles himself to roost, he sits a short time with his tail retroverted, so as to make an acute angle with the line of his back; he then turns his bill over his right shoulder, nestling it in the soft feathers of the back (on which last the under mandible rests), till the bill is so entirely covered that no trace of it is visible. When disturbed, he does not drop his tail, but almost immediately returns his bill to the comfortable nidus from which he had withdrawn it. At these times the bird has the appearance of a ball of feathers.”

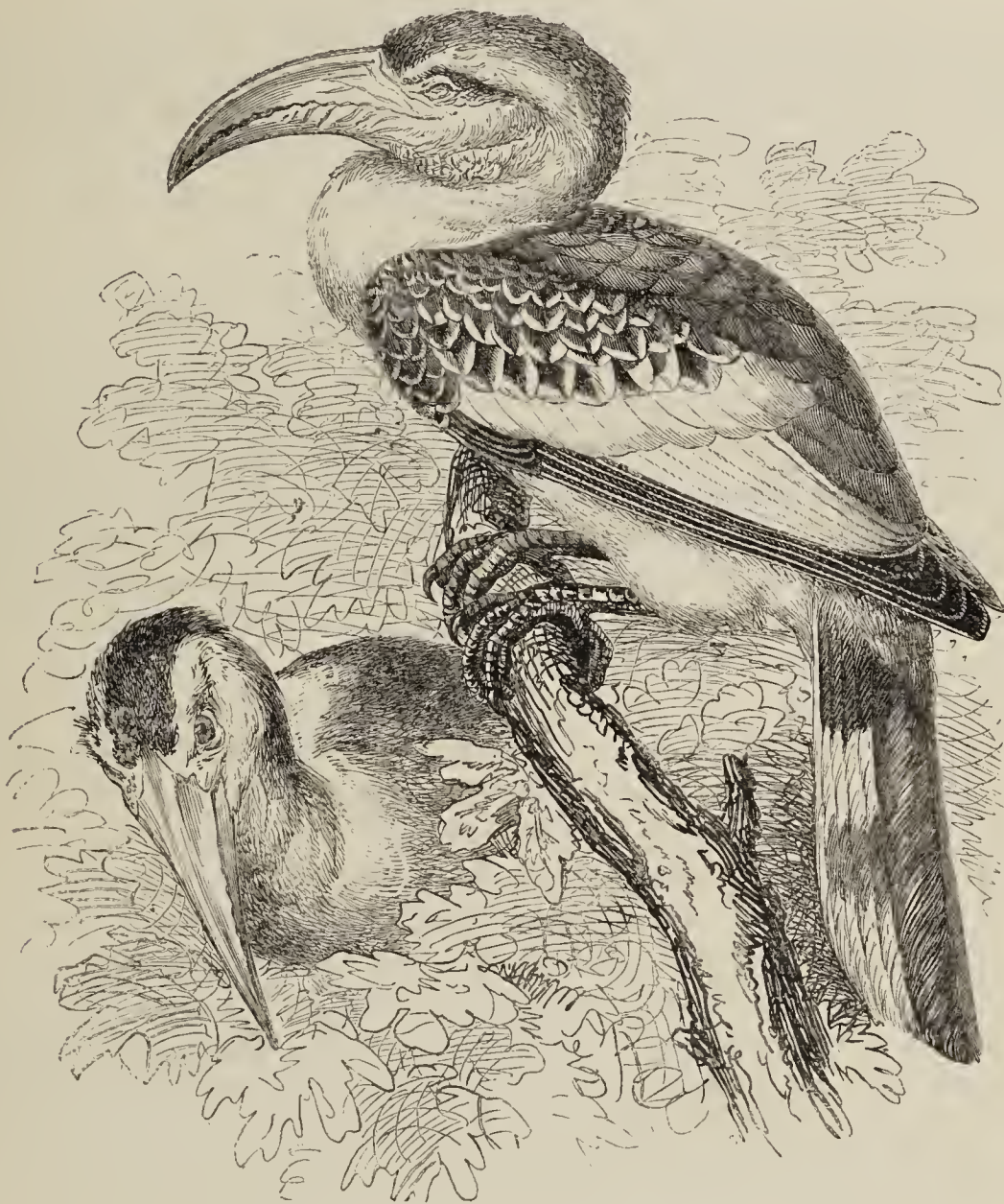
THE TUKANA.

The TUKANA (*Ramphastus Temminckii*) has the feathers in the fore part of the throat of a bright yellow, edged with a paler shade. The hinder parts of the body are red, and the breast is adorned by a red line. The beak is glossy black, with a broad light yellow streak towards its base; the eye is blueish, the bare eye-ring deep red, and the foot lead-grey. The length of this species is eighteen inches and a half, and its breadth twenty-one inches. The wing measures seven inches, and the tail six inches and a half. The Tukana is an inhabitant of the forests on the coast of Brazil.

The HORN-BILLS PROPER (*Bucerotes*) are at once recognisable by the remarkable horn-like protuberance that in many species rises at the base of the very long, thick, and more or less curved beak. Their body is slender, the neck moderately long, and head comparatively small; the tail, composed of ten feathers, is of medium size, or very long; the wings short, and very decidedly rounded, the tarsus short and the toes slender. In many species the throat and region of the eye are bare, and the eyelid furnished with well-developed eyelashes.

These birds inhabit the Eastern Hemisphere, and are especially numerous in some parts of Asia and Africa. Dense woods and forests are their favourite resorts, and where these are to be met with they often live at an altitude of ten thousand feet above the level of the sea; only a few of the smaller species occasionally frequent shrubs or bushes. Lesson tells us that certain species devour nutmegs, from which their flesh acquires a most appetising flavour. Some writers inform us that they will consume carrion, and when in confinement have been known to swallow rats and mice whole, after bruising their bodies with their powerful mandibles. The Hornbills associate in flocks, which frequent woods and forests, and perch on the loftiest trees. We learn from the naturalist above quoted that the noise produced by a party of these birds when passing through the air is very alarming to those who are unaware that the strange sound that accompanies their movements is produced by the clattering of their huge mandibles, and the utterance of a loud croak; these discordant sounds bearing no distant resemblance to one of those sudden and violent winds which often come on unexpectedly in tropical climates. Their voice may be described as the blast of a bugle, combined with the sudden hiss of an exploding sky-rocket; they seem to utter these calls periodically, without any obvious reason, as if to relieve the monotony of their still and melancholy lives. Major Denham tells us that an Abyssinian species lives upon insects, fish, and snakes, and appears to display an especial instinct in finding the latter. The Hornbill discovers their vicinity while they are yet underground, digs on the spot, destroys the nest, and feeds on the venomous inhabitant and its eggs. “The first time I saw a Hornbill’s nest,” says Dr. Livingstone, speaking of another species, “was at Kolsberg, when I had gone to a forest for some timber. Standing by a tree, a native looked behind me, and exclaimed, ‘There is the nest of a Korwé!’ I now saw a slit only about half an inch wide, and three or four inches long, in a slight hollow of the tree.

Thinking the word Korwé denoted some small animal, I waited with interest to see what he would extract. He broke the clay which surrounded the slit, put in his arm, and pulled out a Tockas, or Red-breasted Hornbill, which he killed. He informed me that when the female enters her nest, she submits to real confinement; the male plasters up the entrance, leaving only a narrow slit, that exactly suits the form of his beak, by which to feed his mate. The female makes the nest of her own feathers, lays her eggs, hatches them, and remains with the young till they are fully fledged. During



THE TOK (*Rhynchaceros erythrorhynchus*).

all this time, which is stated to be two or three months, the male continues to feed her and the young family. The prisoner generally becomes fat, and is esteemed a very dainty morsel by the natives, while the poor slave of a husband gets so lean that, on the sudden lowering of the temperature that often occurs after a fall of rain, he is benumbed and dies."

Dr. Livingstone also gives the following interesting anecdote illustrative of the affection of these birds to their mates:—"Near sunset, on the 25th of August" (he writes from Dakanamoio Island), "we saw an immense flock of the largest species of Hornbills (*Buceros cristatus*) come here to roost on the great trees which skirt the edge of the cliff; they leave early in the morning, often before sunrise, for their feeding-places, coming and going in pairs. They are evidently of a loving

disposition, and strongly attached to each other, the male always nestling close beside his mate. A fine male fell to the ground from fear at the report of Dr. Kirk's gun; it was caught and kept on board. The female did not fly off in the mornings to feed with the others, but flew round the ship, anxiously trying, by her plaintive calls, to induce her beloved one to follow her. She came again in the evenings to repeat the invitation; the poor disconsolate captive refused to eat, and in five days died of grief because he could not have her company. No internal injury could be detected after death."

The SMOOTH-BEAKED HORNBILLS (*Rhynchaceros*) are the smallest members of this extensive group. In these birds the beak, which is comparatively small, has both mandibles curved, and the margins more or less denticulated; the feet are short and weak; the wings, in which the fourth or fifth quill is the longest, are of medium size, and the slightly-rounded tail of moderate length.

THE TOK.

The Tok (*Rhynchaceros erythrorhynchus*), a species inhabiting a large portion of Africa, is of a reddish grey upon the mantle and dirty white on the under side; the head and throat are greyish white; the wing-covers black, spotted with yellowish white on the inner web, with the exception of the innermost, which is white on the outer and brownish grey on the inner web; the two centre tail-feathers are a dull grey, the rest are black and white. The eye is deep brown, the beak blood-red, with a dark patch at the base of the lower mandible, the feet are brownish grey. This species is seventeen inches and three-quarters long, and twenty-two broad; the wing measures six inches and a half and the tail seven inches and a half. The female is similarly coloured, but considerably smaller than her mate.

The Tok is commonly met with in all the forests of Abyssinia, Eastern Soudan, and Cordofania, and occurs, we believe, throughout the whole of the wooded portions of Central, Western, and Southern Africa. Occasionally we have noticed it living among the wooded portions of the steppes, and have seen it in large numbers upon the lofty trees that abound in the river valleys. According to Heuglin, it is found upon the mountains at an altitude of seven thousand feet above the sea. Like other Hornbills, it is a true tree-bird, and but rarely descends to the ground, except when the supply of fruit and berries upon which it principally subsists falls short. Certain trees are usually selected as favourite resting-places, and upon them it perches with the utmost regularity, taking possession of the highest branches, upon which it sways itself to and fro, varying the entertainment from time to time by hopping clumsily from bough to bough. Its flight somewhat resembles that of the Woodpecker, and is produced by a series of rapid strokes, by means of which the bird rises quickly into the air to a certain height, from whence it precipitately descends, with the head downwards, in a series of curves. This process is repeated many successive times, the tail meanwhile being alternately spread and closed. The cry of the Tok, which is supposed to be represented by its name, is usually reiterated with great persistence and such rapidity as frequently to have almost the effect of one sound prolonged for a minute at a time, each note being accompanied by a duck of the head that gives a most absurd effect to the whole performance, as, owing to the quickness of utterance in which the bird indulges as it becomes excited, it is compelled to exert itself to the utmost, in order that the bow and the cry may be simultaneous. In disposition this species exhibits all the curiosity and keenness of observation possessed by the Raven, and, like that noisy bird, never fails to betray the presence of any unusual object to all its feathered companions by the loudness of its warning cries, which appear to be uttered solely for their benefit, for the Tok itself boldly darts down upon even the larger birds of prey, and grievously torments the leopard of its native forests by harrying it

during its search for food. The stomachs of such of these birds as we examined contained only fruits, seeds, and insects, but it is probable that they also plunder nests and devour small quadrupeds. Heuglin mentions having seen a nearly-allied species on a piece of carrion, but whether it was employed in consuming it or merely in gleaning the flies from its surface he was unable to ascertain. The Arabs state that the Tok deposits its eggs in holes in trees, at the commencement of the rainy season.

The TWO-HORNED HORNBILLS (*Dichoceros*), as the Indian representatives of this family are called, are recognised by the large, high, broad appendage, divided into two portions in front, which covers a considerable part of the forehead, and extends over one-third of the beak.

THE HOMRAY.

The HOMRAY, or GREAT TWO-HORNED HORNBILL (*Dichoceros bicornis*), is principally black ; the throat, tips of the upper tail-covers, the lower tail-covers, and a spot on the wing, the base of the primaries, the extremities of all the quills and entire tail-feathers, with the exception of a broad black band near the tip, are white ; occasionally the feathers of the throat and wings have a yellowish shade. The eye is scarlet, the upper mandible and its appendage red, shading into yellow, the latter black at its extremity ; the lower portion of the beak is yellow, tipped with red ; a dark brown line passes along the centre of the bill, which is greyish black at its base ; the bare skin around the eyes is black, and the foot deep brown. This species is four feet long, the wing measures from nineteen to twenty, and the tail seventeen inches ; the beak ten inches ; its appendage is seven inches and a half long and three inches and a half broad.

The Homray frequents the high-standing woods of India, from its extreme south to the Himalayas, and from the Malabar coast to Assam, Burmah, and the Malay peninsula ; it is also occasionally seen on the island of Trincomalee.

“ This large Hornbill,” says Jerdon, “ is found in the forests of Malabar, from the extreme south up to Goa, and also in the Himalayas ; I have not seen it in any other of the forest regions. It is also common in Assam, Burmah, the Malay peninsula, and in Sumatra. I have seen it but rarely in the forests of Malabar below the Ghâts. It is generally met with on the sides of the hills. I have seen it up to five thousand feet on the eastern slope of the Neilgherries ; and on the Himalayas, near Darjeeling, at a height of from three thousand to five thousand feet. Hodgson states that it tenants the lower ranges of hills contiguous to the plains. It is sometimes seen in pairs, occasionally in small flocks, generally keeping to the thickets and jungle or to lofty trees, but is sometimes to be found seated on a high tree in an open space ; the same writer says that it seems to prefer the most open and cultivated spots in the wilds it inhabits, these spots being usually limited to the banks of rivers. This naturalist must have seen many more of this species than I have done, for he speaks of twenty to thirty birds being commonly found in the same vicinity, and six or eight on the same tree. I never saw a flock of more than five or six, either in the south of India or in the Sikim Himalayas, and even that very rarely. It is in general rather a silent bird, making merely a deep but very loud croak. Occasionally, however, when a party are together, they utter most loud, harsh, and discordant cries. Hodgson says that the clamour made by a wounded bird is perfectly amazing. ‘ I cannot,’ says he, ‘ liken this vehement vociferation to anything but the braying of a jackass ; its power is extraordinary, and is the consequence of an unusually osseous structure of the rings of the trachea.’ The Homray flies with more repeated flappings of its wings than the other Hornbills, only in general sailing just before alighting on a tree. The noise of its wings can be heard more than a mile distant. Like the others, it builds in holes in large trees ; the male builds the female in, by covering

the hole where she incubates with mud (Baker says with its ordure), leaving only room for her bill to protrude and receive food from his. This, Major Trikell, whose words I quote, has seen with his own eyes. Mason, in his work on Burmah, makes the following statement:—‘The female must sit during her incubation, for if she breaks through the enclosure her life pays the forfeit; but, to compensate for the loss of freedom, her spirited mate is ever on the watch to gratify his dainty mistress, who compels him to bring all her viands unbroken, for if a fig or other fruit be injured she



THE HOMRAY (*Dichoceros bicornis*).

will not touch it.’ This account, I must own, I regard as a native story, and improbable. Fruit forms the only food of this, as of other Indian Hornbills, and it always seizes it whole, tossing it in the air before swallowing it, and catching it again in its mouth. Mr. Elliot remarks of this species that a small sac is placed at the root of the tail, in which is a bundle or pencil of short bristles, forming a brush, from whence exudes a yellow oily secretion, with which the birds appear to dress their white wing-feathers. When first shot the yellow colour comes off the bill in considerable quantities, and the only parts of the body besides that are stained with this colour are the white wing-spot, the rump, and the small crest at the back of the head, this latter but slightly. The yellow

substance continued to exude from the brush long after my prepared specimen was dry. The Garuda, as this species is also called, is sacred to Vishnu among the inhabitants of the forests."

THE DJOLAN, OR YEAR BIRD.

The DJOLAN, or YEAR BIRD (*Rhyticeros plicatus*), represents a group principally characterised by



THE DJOLAN, OR YEAR BIRD (*Rhyticeros plicatus*).

a wrinkled excrescence situated on the upper mandible. The wings are of medium size, and the feet short and powerful; the tail is rounded at its extremity. The plumage of the Year Bird is principally black; the top of the head is brownish yellow, and the tail white; the eye is brownish red, the beak light horn-grey, and the foot blackish grey. The bare skin upon the throat is pale yellow in the male, and dull blue in the female. In other respects the latter resembles her mate. The young are without the excrescence on the beak, which only develops after they are full grown. The name of Year Bird is derived, as we are told, from an idea formerly prevalent that a fresh wrinkle was annually added to the remarkable skin-like growth on the upper mandible.

The Djolan, as this bird is called by the natives, inhabits the Sunda Islands and Malacca, where it frequents extensive forests and promontories, from three thousand to four thousand feet above the sea, rarely ascending beyond that height, apparently because certain favourite fruit-trees do not grow above that point. From early morning it may be seen sweeping in a direct line above the summits of the loftiest giants of the forest, with head and neck thrust forward, producing as it flies the remarkable rushing sound above described. These birds live in pairs throughout the entire year, and subsist upon various kinds of fruits. We have made various successful attempts to rear the young on cooked potatoes and fruit, but have frequently found that the adults refused all nourishment, and only survived their captivity a few days. Whilst at liberty we have never heard this species produce any sound; but, when excited, the prisoners uttered a loud grunting resembling that of an angry pig. Despite the light construction of their large beak, they bite very sharply, and we have known them make a hole through a half-inch plank with which their cage had been repaired. The nest of this species is placed at a considerable height, in the hollow of one of the huge trees, covered with dense masses of parasites that form so striking a feature in the primitive forest. The only nest we were fortunate enough to find was betrayed to us by the movements of the male bird. This breeding-hole was some sixty feet above the ground; in it we saw the female securely walled up with a mixture of earth and bits of decayed wood, firmly cemented together with what we believe to be spittle from the male bird's beak. Only a small aperture was left, through which the female could obtain the fruits assiduously brought her by her affectionate spouse. This breeding female had lost almost all the principal wing and tail feathers, and would therefore have been powerless to save herself from danger had she not been thus safely protected. The natives informed us that the female always moults in this manner during the period of incubation, and does not recover her plumage till the young are ready to fly. Horsfield mentions having been told that should the male bird discover that a rival has attempted to minister to his partner's wants during his absence in search of food, he at once tears down the protecting wall, and leaves his fickle mistress to perish from exposure and hunger. The nest of this bird described by Bernstein was formed of a few twigs and chips of wood placed at the bottom of the hole, which contained a still blind nestling, and an egg that was nearly hatched. The latter was of small size, oval in form, and had a rough white shell, marked here and there with pale red and brown spots and cloudings. In an account given by Layard of the incubation of an allied species, he says: "My friend, Mrs. Baker, thus speaks of the singular habits this bird exhibits, in common with its congeners, of blocking up the sitting female in her nest:—'Building her up with mud and sticks into old broken hollow trees, or between the crowded stems of the tall euphorbia in the forests, and closing up the entrance in such a manner that it is impossible to escape, only leaving a small hole for the purpose of feeding her during her long imprisonment; I do not know how long she is thus kept in duration vile, but we have sometimes taken the females out, and found them so cramped and weak as to be unable to fly. This peculiar habit may be a precautionary measure, to protect the female during the season of incubation, as she may be too dull and exhausted to fly from approaching danger. Depend upon it, it is not done in vain. We self-willed and presumptuous beings often act without reason or reflection, but the birds of the air and the lilies of the field are protected by a higher Power.'"

THE ABBAGAMBA, OR ABYSSINIAN HORNBILL.

The ABBAGAMBA, or ABYSSINIAN HORNBILL (*Bucorax Abyssinicus*), a well-known African species of the above family, is a large, powerfully-formed bird, with short wings and tail and long legs. Its huge beak, about a foot in length, is slightly curved, flat at its sides, and blunt at the tip. The base of the upper mandible is surmounted by a high protuberance. The regions of the eye and throat are

bare, and very brightly coloured. In the wing the sixth quill is longer than the rest. The entire plumage, except six yellowish white primary quills, is of a glossy black, the eye is dark brown, and the beak black, with a red and yellow spot on its upper mandible. The eye-rings and throat are dark grey, the latter bordered with bright red. The female is smaller than her mate, and has only a comparatively small portion of her neck bare. The length of the male is forty-three inches and a half,



THE ABBAGAMBA, OR ABYSSINIAN HORNBILL (*Bucorax Abyssinicus*).

and his breadth seventy inches; the wing measures twenty-one inches and three-quarters, and the tail thirteen inches and a half.

This remarkable bird is found over a large portion of Africa, and is common in Abyssinia, where it subsists principally on a large beetle that abounds in the Teff fields at certain seasons. In some parts of the continent it is regarded with superstitious veneration, and is known as the Tier el Naciba, or Bird of Destiny. So strong, indeed, is this feeling among the natives, that they will not permit an Abbagamba to be killed near their dwellings, lest they should lose their flocks and cattle by disease; under any circumstances, however, this species is but little liable to molestation, as the disgusting stench emitted by its body renders a near approach to it almost impossible. During the breeding season the Abyssinian Hornbills live in pairs, but after that period wander about the fields in parties

in search of locusts, grasshoppers, and beetles. Gourney tells us that they also devour snails, lizards, frogs, rats, mice, and similar fare. Insects they obtain by hacking in the ground with their powerful bill, and then, after tossing their victim in the air, catch it in their extended mandibles as it descends. According to Gourney they attack snakes with great intrepidity, employing their wing as a shield against the dangerous foe, and, should he prove formidable, calling in the assistance of their companions, in order more speedily to dispatch him. When excited, these strange birds present a most extraordinary appearance, as they stalk along with throat inflated and wings trailing, the tail meanwhile being constantly opened and closed, after the manner of a Turkey-cock. Their step, which resembles that of a Raven, is unsteady, and their movements in the air, contrary to the usually received idea, both light and graceful; they, however, rarely fly to any distance, but, if alarmed, merely rise and take refuge in a neighbouring tree. Should any suspicious sound attract the attention of a party of these birds, they stand erect and listen attentively, with bill wide open, and, at the first note uttered by one of their number, at once hurry to a place of safety, usually selecting such spots as command a free view of the surrounding country. The cry of the Abbagamba is deep, harsh, and so resonant that, according to Gourney, it can be heard at the distance of more than a mile. While engaged in attracting the attention of his mate, the male often continues his call, almost without intermission, for a quarter of an hour at a time, and is answered by her repeatedly in a somewhat higher tone. The nest, as we ourselves ascertained, is made in large hollow trees, with the entrance on the east side. The eggs, we learn from Heuglin, are small and round, with a rough white shell. A nestling found by us at first exhibited no trace of the horny excrescence on its bill, and, on being shut up in a yard with a variety of other live stock, soon became tame, and lived on excellent terms with its companions.



GALLINACEOUS BIRDS (*Gallinæ*).

WE have now arrived at an important division of the feathered tribes, all the members of which are more or less terrestrial. They generally procure their food from the surface of the ground, upon which they run or walk with facility, and many of them scratch up the earth in search of such nutritive materials as serve for their subsistence. They have, therefore, in conformity with such a mode of life, a short or moderately long beak, which is usually vaulted above. Their body is heavy, and their wings generally short. They all live principally upon grain, and are furnished with a strong muscular gizzard. To this order belong our game birds, and most of our poultry. Their flesh is edible, and supplies us with wholesome and nutritious food, and from the facility with which they are procurable, and the ease with which some are domesticated, are of the utmost importance to mankind.

The members of this division were separated by Cuvier into two sections—the COLUMBÆ, or Pigeons, and the GALLINÆ, properly so called. More recently, however, these sections have been considered as forming two distinct orders, distinguished by the names of the PIGEONS (*Gyratores*) and the SCRAPERS (*Rasores*), or TRUE GALLINACEOUS BIRDS.

PIGEONS.

The place which the Pigeons ought to occupy in the zoological system has been a very fertile subject of dispute. Linnæus classed them with the *Passeres*; Buffon, Pennant, and Latham arrange them as an order by themselves; while Cuvier and others place them in the category of Gallinaceous Birds. The settlement of this question is, indeed, a matter of considerable difficulty, as the habits of the entire race are in many respects very peculiar. Like the Passerine Birds, they associate in pairs during the nuptial season, work together in the construction of their nest, and materially assist in the incubation of their eggs and the care of their progeny, which latter, blind and helpless when they are first hatched, are fed in the nest that forms their cradle, and which they never quit until fully fledged; indeed, for some time afterwards they are unable to supply their own wants, and depend entirely upon the assistance of their parents. The features in which they differ from the Passerine race are, however, equally well marked; these consist in their manner of drinking and of administering food to their young family, in the singularity of their caresses, in the nature of their plumage, and in their vocal capabilities. They neither sing nor utter any cry; their only voice in the adult state consists of a full, rolling sound, generally designated by the term “cooing.” Other dissimilarities separate them from the Gallinaceous races, with which they have little in common, either in their instincts, their manner of life, or their mode of pairing. The *Gallinæ* are almost all of them polygamists, and the females, by laying numerous eggs, produce a covey at a single brood. Moreover, in temperate climates, this happens but once in the year. The Pigeons, on the contrary, are all of them strictly monogamous, and the female lays but two eggs for each sitting, although she has several broods. In the Gallinaceous tribes the male renders no assistance to the female, either in the construction of the nest or in the care of their progeny. The chickens are born with their eyesight perfect, and as soon as they escape from the egg-shell are able to run about, and procure for themselves their own food. The principal distinctive character of the *Columbæ* is furnished by the structure of the bill. The upper mandible consists of a horny apical portion, which is often of considerable length and strength,

but its base is formed by a convex cartilaginous plate, in the anterior-portion of which the nostrils are situated. The skin covering the cartilaginous portion is of a soft texture, very different from the rest of the bill. It is sometimes smooth, and clothed with a sort of scurf, but in other cases it is warty, or even developed into a fleshy wattle. This is especially the case in some domesticated varieties of the Pigeon. The *Columbæ* are provided with short tarsi and moderately long toes, all scutellated. The toes are four in number, three in front and one behind. The anterior toes are not united by a membrane at the base. The hinder toe is placed on the same plane with those in front, and the whole sole of the foot is formed of soft papillated pads, which are usually a good deal wider than the scutellated upper portion of the toes. The wings, which are generally long and pointed, contain ten primary quills, and the tail usually consists of twelve feathers, although in some cases there are sixteen. Another important character distinguishing these birds, as compared with the *Gallinæ*, is that their feathers are destitute of the plumules, or accessory plumes, which are greatly developed in Gallinaceous Birds. The form of the wing in Pigeons is sufficient to indicate that they are capable of powerful flight, and many of them are remarkable for the speed with which they traverse the air, especially when engaged in their migrations. Most of them are arboreal, and nestle in the holes of trees; others frequent rocks, but all perch with great facility; nevertheless, they generally seek their food upon the ground, and walk or run without difficulty. They are also remarkable for their mode of drinking, in which they differ from all other birds. The general practice of birds in drinking is to take up a small portion of water in the bill, and then, by raising the head, to allow it to run down into the throat. The Pigeons, on the contrary, dip their bills into the water, and hold them there till they have quenched their thirst. These birds are inhabitants of the warmer and temperate regions of the earth, but they are found in most abundance in hot climates, where, also, their plumage attains a brilliancy of which that of our native species gives us but an imperfect idea.

The FRUIT PIGEONS (*Treronæ*) are recognisable by their compact body, short, thick beak, powerful, broad-soled, but short feet, moderate-sized wings, and short tail; the latter is composed of fourteen feathers, and is either slightly cuneiform or straight at its extremity. The plumage, in which green predominates, is always brilliant.

The members of this group inhabit the whole of India, the Malayan Peninsula, Australia, and Africa, and are usually seen in parties of variable number, perched upon fruit-trees. Their movements much resemble those of the Parrots, and their voice, unlike that of most of their congeners, is loud and sweet. Such species of Fruit Pigeons as inhabit India (and probably Africa) place their very loosely-constructed nest at the summit of a lofty tree, and lay two white eggs.

THE PARROT PIGEON.

The PARROT PIGEON (*Phalacroteron Abyssinica*), a beautiful species of the above group, is powerfully built, with long wings and a short tail; its beak, which is short and strong, has the base bare and the upper mandible hooked at its tip; the short tarsus is almost entirely covered with feathers, and the broad-soled foot furnished with small toes; the wing, in which the second quill is the longest, is pointed, and the tail straight at its extremity. The plumage of this beautiful bird is pale olive-green on the mantle and light yellow on the under side; the head, throat, and breast are greyish green, the shoulders of a rich deep red, the wing-covers of a blackish hue, broadly edged with pale yellow; the quills black, edged with a lighter shade; the dark grey tail is black upon the under portion, from the root to the centre, and from that point to the tip of a silver-grey; the purple-red iris is surrounded by a narrow blue ring; a bare patch which encircles the eye is blueish red, the cere of a dirty coral-red; the white beak is shaded with blue, and tipped with pale red; the foot is deep

orange-yellow. The length of this species is twelve and its breadth twenty-one inches; the wing measures six inches and three-quarters, and the tail four inches and a quarter. The female is somewhat smaller in size, but closely resembles her mate in the coloration of the plumage.

This Pigeon has been met with in Great Namaqua Land, Western Africa, and Abyssinia. Temminck informs us that it frequents the settlements of the traders, and is constantly to be seen perching perfectly motionless upon the trees during the heat of the day; at the approach of the rainy season, he tells us, it consorts with others of its species in large flocks, and wanders forth to more southern portions of the continent: our own experience would, however, lead us to condemn the latter statement as erroneous, and, indeed, all recent observations on this point prove that this bird does not migrate. Lofty mimosa-trees, surrounded by bushes of Christ's-thorn, and interlaced with the streaming tendrils of the cissus, are the favourite resorts of such of these birds as inhabit regions where those trees are abundant, while such as occupy the mountain-valleys seek shelter amid the luxuriant foliage of the tamarind-tree, or upon the well-covered branches of the lofty sycamore. Occasionally this species is seen living in pairs, but most usually in small parties of from eight to twenty birds. Even when thus associated, it is easy to distinguish the different couples, as the males constantly perch and fly close to their mates, towards whom they exhibit the utmost tenderness, endeavouring to excite their attention and admiration by agitating their wings, and caressing and tending them with all the devotion exhibited by the Parrot for its mate. The flight of these Pigeons is rapid, and accompanied by a harsh, shrill sound, produced by the violent motion of the wings as they cleave the air. The voice is very unpleasing. Such of these birds as we observed did not utter the cooing note common to many of their congeners. The stomachs of those we shot contained berries of various kinds. Le Vaillant informs us that the Parrot Pigeon deposits her eggs in a bed of moss and dry leaves within a hollow tree, but this statement we believe to be erroneous. Owing to the extreme timidity of these birds, it is exceedingly difficult to obtain specimens.

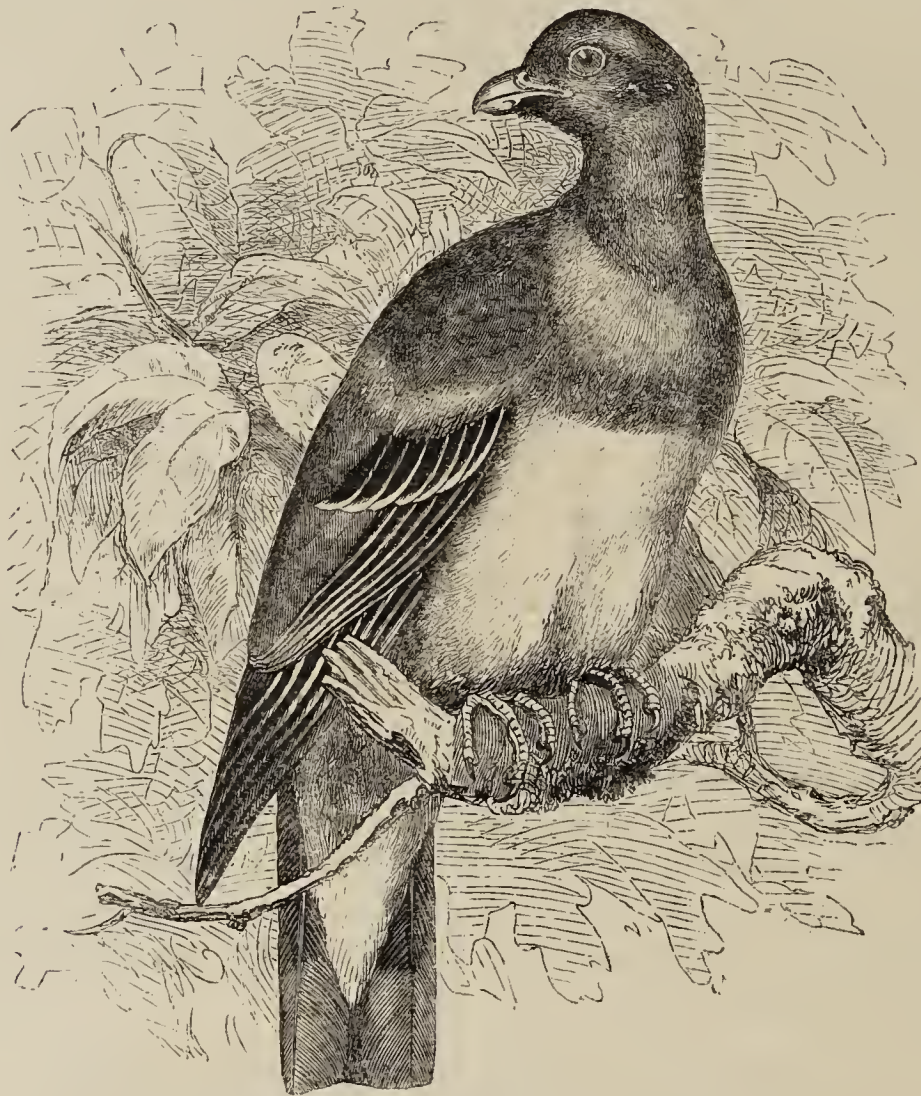
The DOVES (*Columbæ*) are distinguishable from the above group by the peculiar form of their delicate, moderate-sized beak, which is covered with a cere at its base, is slightly vaulted, and has a hard, sharp tip. The comparatively high, slender foot is well adapted for walking firmly on the ground; the tail, composed of twelve feathers, is either rounded or straight at its extremity, and the plumage not remarkable for its brilliancy. The members of this group occupy all parts of the globe, Europe being particularly rich in species.

THE RING-DOVE, WOOD PIGEON, OR CUSHAT.

The RING-DOVE, WOOD PIGEON, or CUSHAT (*Palumbus torquatus*), has a large and strongly-built body, comparatively long tail, and short feet. The plumage of the adult bird is of a deep blue on the head, nape, and throat; the upper part of the back and upper wing-covers are dark greyish blue, and the lower portion of the back and rump light blue; the breast is reddish grey, the centre of the under side light greyish blue, and the lower belly white. The lower part of the throat is decorated on each side with a glossy white spot, and gleams with metallic lustre; the quills are slate-grey and the tail-feathers slate-black, marked with an irregular stripe of lighter shade. The female is recognisable from her mate by the inferiority of her size, and the young birds by their comparatively pale plumage. In all, the eye is pale sulphur-yellow, the beak light yellow, with a red base, and the foot blueish red. The length of the body is sixteen inches and a half, and the breadth twenty-eight inches and a half; the wing measures nine and the tail six inches and a half.

The Ring-dove, so called on account of the white feathers that partially encircle the throat, is the largest of all the wild Pigeons met with in Europe, the warm and temperate portions of which it

frequents in large numbers, only visiting such northern countries as Sweden and Norway during the warm seasons. It is particularly fond of fir plantations, and in these its tender, cooing note may be heard during the entire spring and summer. In England these Pigeons resort to woods, coppices, and enclosed ground; and in winter assemble and roost in large parties on the summits of lofty trees, the ash-tree affording them a very favourite gathering-place. Their food consists of young leaves and seeds of various kinds, according to the season of the year. In spring and summer they subsist principally on the tender leaves of growing plants, and often commit great ravages in fields of beans



THE PARROT PIGEON (*Phalacroteron Abyssinica*).

and peas. Spring-sown corn is also attacked by them, both in the grain and the blade; and as soon as young turnips have put forth their second leaves, they, too, become objects of devastation. As the season advances they visit the corn-fields, especially those in the neighbourhood of their native woods, and seek for oily seeds of all kinds with great eagerness. At the approach of autumn they assemble in small flocks, and resort to oak and beech trees, where acorns and beech-mast, swallowed whole, afford them an abundant and nourishing diet. In winter these small flocks unite, and form larger ones, so large, indeed, that it would appear probable that their numbers are considerably augmented by arrivals from colder climates. Both parents assist in making their strange and carelessly constructed abode, which scarcely deserves to be called a nest, being nothing more than a mere platform of twigs, so loosely put together that the brood is distinctly visible through the interstices. The fork of a branch is usually selected as a resting-place for the nest. The eggs, two in number, are long,

rough-shelled, and of a glossy white ; both ends are of equal breadth. The work of incubation is shared by both parents ; the father, in such broods as we have observed, taking his place upon the nest from about nine or ten in the morning till three or four in the afternoon. When first hatched the young are fed with pulp from the crops of the adult birds, and, when older with softened seeds. When strong enough to go forth into the world, each parent takes care of a fledgling, and conducts it into the fields to seek for food on its own account. Towards man these birds exhibit much timidity, and if disturbed whilst brooding often desert their eggs.



THE RING-DOVE, OR WOOD PIGEON (*Palumbus torquatus*).

The Ring-dove is easily tamed, but very rarely breeds in captivity ; and even when reared from the nest, if set at liberty, it at once seeks its native woods, and never voluntarily returns.

In all ages of the world this Dove has been regarded with especial favour, and, as a sacred symbol, is in some countries regarded with particular reverence.

The Himalayan Cushat differs from the European by the neck-patch being clayey buff instead of white, and much contracted in size, also in the less extent of the white border to the primaries. Mr. Blyth also notices that whilst in European birds the green gloss prevails above the neck-patch, and amethystine below, the reverse is the case in the Asiatic race. This Wood Pigeon has only been found in the North-western Himalayas, near Simla, and in the Alpine Punjaub. It visits the salt range and the plains of the Punjaub during winter.

THE STOCK DOVE.

The STOCK DOVE (*Columba oenas*) is of a deep blue upon the head, throat, upper wings, lower part of back, and rump; the upper portion of the back is deep greyish blue, the region of the crop rich deep red; the rest of the under side pale blue. The quills and ends of the tail-feathers are slate-blue, the wing is decorated with a dark band, and the neck enlivened by the metallic lustre common to the race of Pigeons. The eye is deep brown, the beak pale yellow, with dark flesh-pink base, powdered with white, and the foot pale red. The young resemble the parent birds, but are duller in their colours. The length of this species is from twelve inches to twelve and a half, and its breadth from twenty-five to twenty-six inches; the wing measures eight inches and a half and the tail five inches.

Many authors have regarded this as the same species as the Rock Dove, or as having but trifling differences. Yarrell, however, considers them to be perfectly distinct, both as to habits, voice, plumage, and the localities which they frequent. "The Stock Dove," says this accurate author, "was called *oenas** on account of the vinous claret-colour of the plumage of the neck; and Stock Dove, not because it was by some considered to be the origin of our domestic stock, but because it builds in the stocks of trees, particularly such as have been headed down, and have become in consequence rugged and bushy at the top." In more open parts of the country, holes in the ground are selected as breeding-places, especially the burrows of rabbits. When the warreners find the young in a burrow, they fix sticks at the mouth of the hole in such a manner as to prevent the escape of the young, but so as to allow the old birds to feed them. Bishop Stanley refers to this bird's habit of building in holes as illustrative of a passage in Scripture. He says: "In the Eastern countries and the Holy Land, the Wild Pigeons almost invariably prefer such situations to trees, thus confirming the words of the prophet, who speaks of the 'dove that maketh her nest in the sides of the hole's mouth' (Jer. xlvi. 28)."

When the eggs are laid in this manner in deserted burrows, they are either placed on the bare sand or upon a few dried roots, about a yard within the entrance. The Stock Dove also nestles under furze bushes, or in the holes of decayed trees. The eggs are two in number, oval and white, and are laid about the end of March or beginning of April. The food of the Stock Dove is similar to that of the last-mentioned species.

The *Columba oenas* has not been found in Scotland. On the continent of Europe it is abundant, visiting the central and northern parts during the summer, and it has been seen in Northern Africa. It is also said to be met with in the Deccan. The harsh and somewhat grunting note of this species is usually uttered while the bird is perching, and is accompanied by considerable inflation of the throat. When in flight its movements are very rapid and noisy, the wings producing a rushing sound, which gradually becomes shriller and clearer, but altogether subsides when the gently hovering motion commences that precedes alighting. So strong is the love of the Stock Dove for its favourite retreat, that even if repeatedly alarmed it returns immediately to its place. The period of incubation commences early in spring, and, if not disturbed, the female produces three broods in the season, the first eggs being deposited by the beginning of April. During the whole time his mate is thus busily engaged, the male bird testifies the greatest devotion, keeping close to her, and constantly uttering his cooing note. Many are the quarrels that ensue between the various couples at this period, for, as each requires an unused hole in some tree wherein to deposit a brood, the demand is usually greater than the supply, and as these localities are also much resorted to by such formidable

* *Oenas*, from *oinos*, wine; a name given to this bird by Ray.

antagonists as Starlings, Woodpeckers, and Jackdaws, the domestic career of a pair of Stock Doves is by no means one of uninterrupted peace and harmony. This constant change of domicile is rendered necessary by the rapid accumulation of the castings from the young, with which the inmates become so soiled that some time elapses after they have left the nest before the feathers are thoroughly purified; fortunately for the building birds, by the following season, insects of various kinds and the busy Woodpecker have cleared away the refuse from the holes, and made them fit for occupation. We are told that the affection of this species for its brood is so strong that it is almost impossible to force the parent birds away, and that a female Stock Dove will remain to be shot rather than desert her eggs.

THE ROCK DOVE.

The ROCK DOVE (*Columba livia*)—see Coloured Plate XXVII.—is of a pale greyish hue on the mantle and bright blue on the under side; the head is light slate-blue, the throat deep slate-colour, glistening above with bright blueish green, and on its lower portion with a purple gloss; the rump is white. Two black lines pass across the deep grey wings; the tail-feathers are dark bright blue, tipped with black; those at the exterior are white on the outer web. The eye is sulphur-yellow, the beak black, with a light blue base, and the foot deep blueish red. The sexes are alike, and the young somewhat deeper in their colours than the adult birds. This species is thirteen inches long and twenty-three broad; the wing measures eight inches and one-sixth and the tail four inches and one-third.

The Rock Dove in its natural state inhabits rocky sea-coasts, flying only sufficiently inland to procure food. It is spread over a very wide range of country, being met with as far north as the Faroe Islands, and as far southward as Africa. In Great Britain it is found both on the southern coasts of England and in the east and west of Scotland. In the Orkneys it breeds in the crevices of the rocks, the nests being at such a depth that they are quite out of reach. During the day the Doves associate in flocks and search for food, which consists principally of grain and seeds.

The Rock Dove breeds twice in the season, each brood consisting of two young, generally a male and a female. The eggs are white and of a short oval shape, rather pointed at one end. From this species our Dove-cote Pigeons are derived, and they, like their original progenitors, seldom roost or settle on trees.

The nest of the Rock Dove is a mere heap of straw, dry grass, and twigs, with a slight hollow in its centre for the reception of the eggs, which have a glossy, pure white shell. The female alone builds, but is supplied with materials by her devoted mate, who remains constantly near her both day and night. The blind and unusually helpless young are hatched about sixteen or eighteen days after the eggs are laid, and leave the shell within from twenty-four to thirty-six hours of each other. As with their congeners, the nestlings are at first nourished with pulp from the crops of their parents, then with partially digested seeds, and when fledged, with hard seeds, with the addition of tiny pebbles and bits of clay, to assist the still weak gizzard in the work of trituration. When about a month old the young are strong enough to quit the nest in company with their parents, who, however, soon leave them to their own devices, and at once commence their preparations for a second brood.

“The Blue Pigeon, or Rock Dove of India” says Jerdon, “differs from that of Europe only in having an ash-coloured instead of pure white rump. It is one of the most common and abundant birds, congregating throughout the country in large flocks, and breeding wherever they can find suitable spots. They are most partial to large buildings, such as churches, pagodas, mosques, tombs, and the like, frequently entering verandahs of inhabited houses and building in the cornices. Hollows in walls of cities or towns are favourite places, and in some parts of the country they prefer holes in wells. In default of such spots they will breed in crevices and cavities of rocks, caverns, and sea-side cliffs, and are particularly partial to rocky waterfalls. The celebrated falls of Gaissoppa are

tenanted by thousands of Blue Pigeons. These Pigeons are held in respect by most Hindoos, and almost venerated by some, insomuch that if a pair build in the house of a native he considers it a favourable omen."

The CUCKOO PIGEONS (*Macropygia*) constitute a group distinguishable by the slender formation of their bodies, their small heads, long tails, and short wings and feet. These birds are all



THE PASSENGER PIGEON (*Ectopistes migratorius*).

eminently social in their habits, and frequently keep together in large flocks. All subsist principally upon fruit and seeds, and, in order to obtain these, constantly occupy woods and forests, from whence they occasionally venture forth to seek for food in well-planted gardens and orchards.

THE PASSENGER PIGEON, OR CAROLINA TURTLE-DOVE.

The CAROLINA TURTLE-DOVE, or PASSENGER PIGEON (*Ectopistes migratorius*), a large and well-known member of the above group, inhabiting North America, is very powerfully built, and has a long neck and small head. The medium-sized beak is slenderly formed, and the wing, in which the second quill exceeds the rest in length, long and pointed; the tail is long and graduated, the tarsus strong, but shorter than the centre toe without its claw. The plumage of the mantle is

slate-blue and the under side reddish grey ; the sides of the throat gleam with violet ; the belly and vent are white, the wings black, edged with white ; the centre tail-feathers are black, those at the side light grey, marked with greyish brown and black spots at the base of the inner web. The eye is of a brilliant red, the beak black, and the foot crimson. The female is smaller than her mate, with duller plumage, in which greyish brown predominates ; her back and rump are whitish grey, and the centre tail-feathers reddish brown. The length of the male is sixteen inches and a quarter, and his breadth twenty-five inches ; the wing measures seven inches and two-thirds, and the tail eight inches and one-sixth. In the female, the length is only fifteen and the breadth twenty-three inches. The Carolina Pigeons inhabit the United States during the summer season, from Canada to Florida, and from the sea-coast to the west of the Mississippi. In the Northern and Middle States they are partially migratory. In North and South Carolina they assemble in flocks during the winter, sometimes of many hundred individuals, but in the spring they return northward, and most frequently fly in pairs, more than three or four being rarely seen together. Their flight is rapid, and generally accompanied by a whistling sound. They frequently circle about, but seldom mount above the trees, visiting the fields for the grain they may be able to glean, and live principally on seeds, acorns, and berries ; they are also fond of hempseed and Indian corn. In the winter, when food is scarce, they visit the farmyards, and feed in company with other guests.

The nest is but slightly formed of a few twigs, and lined with dry root-fibres. The eggs, two in number, are snow-white. The young are fed by both parents. More than two broods are seldom produced in the year, sometimes there is only one, but this appears to depend upon the time of laying, which in some parts of the United States begins as early as March, in others not until the middle of May, and on the borders of Lake Superior still later in the year. The usual roosting-places of these birds are among long grass in deserted fields, or dried stalks of corn, amid the stubble, or among the withered foliage of trees. They will return to favourite roosting-grounds from a considerable distance ; but though a whole flock often settles in one locality, they seldom roost very near to each other, and if any one approach, even in the darkest night, will at once rise and take flight. The note of the Carolina Turtle Dove is low, plaintive, and repeated at intervals ; in the early spring it may be heard among the newly-budding trees of the forest, even at a considerable distance.

“The Passenger Pigeon,” writes Audubon, “or, as it is usually named in America, the Wild Pigeon, moves with extreme rapidity, propelling itself by quickly repeated flaps of the wings, which it brings more or less near the body, according to the degree of velocity which is required. Like the Domestic Pigeon, it often flies during the love season in a circling manner, supporting itself with both wings angularly elevated, in which position it keeps them until it is about to alight. Now and then, during these circular flights, the tips of the primary quills of each wing are made to strike against each other, producing a smart rap, which may be heard at a distance of thirty or forty yards. Before alighting, the Wild Pigeon, like the Carolina Parrot and a few other species of birds, breaks the force of its flight by repeated flappings, as if apprehensive of receiving injury from coming too suddenly in contact with the branch or spot of ground on which it intends to settle. I have commenced my description of this species with the above account of its flight because the most important facts connected with its habits relate to its migrations. These are entirely owing to the necessity of procuring food, and are not performed with a view of escaping the severity of a northern latitude, or of seeking a southern one for the purpose of breeding. They, consequently, do not take place at any fixed period or season of the year ; indeed, it sometimes happens that a continuance of a sufficient supply of food in one district will keep these birds absent from another for years. I know that in Kentucky they remained for several years constantly, and were nowhere else to be found. They all suddenly disappeared, when the mast was exhausted, and did not return for a long period.

“Their great power of flight enables them to survey and pass over an astonishing extent of country in a very short time. This is proved by facts well known. Thus, Pigeons have been killed in the neighbourhood of New York with their crops full of rice, which they must have collected in the fields of Georgia and Carolina, these districts being the nearest in which they could possibly have procured a supply of that kind of food. As their power of digestion is so great that they will decompose food entirely in twelve hours, they must in this case have travelled between three and four hundred miles in six hours, which shows their average rate of speed to be at about one mile in a minute. A velocity such as this would enable one of these birds, were it so inclined, to visit the European continent in less than three days.

“This great power of flight is seconded by as great a power of vision, which enables them, as they travel at that swift rate, to inspect the country below, discover their food with facility, and thus attain the object for which their journey has been undertaken. This I have also proved to be the case by having observed them, when passing over a sterile district, or one scantily furnished with food suited to them, keep high in the air, flying with an extended front, so as to enable them to survey hundreds of acres at once. On the contrary, when the land is richly covered with food, or the trees abundantly hung with mast, they fly low, in order to discover the part most plentifully supplied.”

The innumerable hosts in which the Passenger Pigeon moves, as related by Audubon and Wilson, might seem to be almost fabulous.

“On my way to Frankfort,” says the latter writer, “when about one o’clock, the Pigeons which I had observed the greater part of the morning flying northerly began to return in such immense numbers as I had never before witnessed. Coming to an opening by the side of a creek called the Benson, where I had a more uninterrupted view, I was astonished at their appearance. They were flying with great steadiness and rapidity at a height beyond gunshot, in several strata deep, and so close together that could shot have reached them one discharge could not have failed of bringing down several individuals. From right to left, as far as the eye could reach, the breadth of this vast procession extended, seeming everywhere equally crowded. Curious to determine how long this appearance would continue, I took my watch out to note the time, and sat down to observe them. It was then half-past one. I sat for more than an hour, but instead of any diminution of this prodigious procession, it seemed to increase in numbers and rapidity, and, anxious to reach Frankfort before night, I rose and went on. About four o’clock in the afternoon I crossed the Kentucky River, at the town of Frankfort, at which time the living torrent above my head seemed as numerous and as extensive as ever. Long after this I observed them in large bodies, that continued to pass for six or eight minutes, and these again were followed by other detached bodies, all moving in the same direction, till after six in the evening. The great breadth of front which this mighty multitude preserved would seem to intimate a corresponding breadth of their breeding-place.”

“In the autumn of 1813,” relates Audubon, “I left my house at Henderson, on the banks of the Ohio, on my way to Louisville. In passing over the Barrens, a few miles beyond Hardensburg, I observed the Pigeons flying from north-east to south-west in greater numbers than I had ever seen them before, and feeling an inclination to count the flocks that might pass within reach of my eye in one hour, I dismounted, seated myself on an eminence, and began to mark with my pencil, making a dot for every flock that passed. In a short time, finding the task that I had undertaken impracticable, as the birds poured on in countless multitudes, I rose, and counting the dots that had been put down, found that one hundred and sixty-three had been made in twenty-one minutes. I travelled on, and still met more the farther I proceeded. The air was literally filled with Pigeons; the light of noon-day was obscured as by an eclipse; the dung fell in spots, not unlike melting flakes of snow, and the continued buzz of wings had a tendency to lull my senses to repose.

“While waiting for dinner at Young’s Inn, at the confluence of Salt River with the Ohio, I saw at my leisure immense legions still going by, with a front reaching far beyond the Ohio on the west, and the beech-wood forests directly on the east of me. Not a single bird alighted; for not a nut or acorn was that year to be seen in the neighbourhood. They consequently flew so high that different trials to reach them with a rifle proved ineffectual, nor did the reports disturb them in the least. I cannot describe to you the extreme beauty of their aerial evolutions. When a Hawk chanced to press upon the rear of a flock, at once, like a torrent, and with a noise like thunder, they rushed into a compact mass, pressing upon each other towards the centre. In these almost solid masses they darted forward in undulating and angular lines, descended and swept close over the earth with inconceivable velocity, mounted perpendicularly, so as to resemble a vast column, and when high in the air were seen wheeling and twisting within their continued lines, which then resembled the coils of a gigantic serpent.

“Before sunset I reached Louisville, distant from Hardensburg fifty-five miles. The Pigeons were still passing in undiminished numbers, and continued to do so for three days in succession. The people were all in arms. The banks of the Ohio were crowded with men and boys, incessantly shooting at the pilgrims, which there flew lower as they passed the river. Multitudes were thus destroyed. For a week or more the population fed on no other flesh but Pigeons’, and talked of nothing but Pigeons.

“It is extremely interesting to see flock after flock performing exactly the same evolutions which had been traced as it were in the air by a preceding flock. Thus, should a Hawk have charged on a group at a certain spot, the angles, curves, and undulations that have been described by the birds in their efforts to escape from the dreaded talons of the plunderer are undeviatingly followed by the next group that comes up. Should the bystander happen to witness one of these affrays, and, struck with the rapidity and elegance of the motions exhibited, feel desirous of seeing them repeated, his wishes will be gratified if he only remain in the place until the next group comes up.

“Perhaps it may not be amiss to make an estimate of the number of Pigeons contained in such a host, and of the amount of food consumed by them. Granting the procession to be a mile broad, which is certainly no exaggeration, and that at a given speed it travels for three hours, we obtain a parallelogram of eighteen square miles, English measure; this, reckoning only two pigeons to the square yard, would give 1,000,115,736,000 individuals in such a flight; and if each Pigeon required daily half a pint of food, the whole multitude would consume 8,712,000 bushels daily. Wilson makes a similar calculation, and arrives at the conclusion that one swarm contains more than 2,000,000,000,000 Pigeons, and requires daily 17,424,000 bushels of corn.

“As soon as the Pigeons discover a sufficiency of food to entice them to alight, they fly round in circles, reviewing the country below. During their evolutions on such occasions, the dense mass which they form exhibits a beautiful appearance as it changes its direction, now displaying a glistening sheet of azure, when the backs of the birds come simultaneously into view, and anon suddenly presenting a mass of rich deep purple. They then pass lower over the woods, and for a moment are lost among the foliage, but again emerge and are seen gliding aloft. They now alight, but the next moment, as if suddenly alarmed, take flight, producing by the flapping of their wings a noise like the roar of distant thunder, and sweep through the forests to see if danger is near. Hunger, however, soon brings them to the ground. When alighted, they are seen industriously throwing up the dead leaves in quest of the fallen mast. The rear ranks are continually rising, passing over the main body, and alighting in front in such rapid succession that the whole flock seems still on the wing. The quantity of ground thus swept is astonishing, and so completely has it been cleared that the gleaner who might follow in their rear would find his labour completely lost.

Whilst feeding, their avidity is at times so great that, in attempting to swallow a large acorn or nut, they are seen gaping for a long while as if in the agonies of suffocation.

“On such occasions, when the woods are filled with these Pigeons, they are killed in immense numbers, although no apparent diminution ensues. About the middle of the day, after their repast is finished, they settle on the trees to enjoy rest and digest their food. On the ground they walk with ease, as well as on the branches, frequently jerking their beautiful tail, and moving the neck backwards and forwards in the most graceful manner. As the sun begins to sink beneath the horizon, they depart *en masse* for the roosting-place, which not unfrequently is hundreds of miles distant, as has been ascertained by persons who have kept an account of their arrival and departure.

“Let us now, kind reader,” continues Audubon, “inspect their place of nightly rendezvous. One of these curious places, on the banks of the Green River, in Kentucky, I repeatedly visited. It was, as is always the case, in a portion of the forest where the trees were of great magnitude, and where there is little underwood. I rode through it upwards of forty miles, and, crossing it in different parts, found its average breadth to be more than three miles. My first view of it was about a fortnight subsequent to the period when they had made choice of it, and I arrived there nearly two hours before sunset. Few Pigeons were then to be seen, but a great number of persons, with horses and wagons, guns and ammunition, had already established encampments on the borders. Two farmers from the vicinity of Russelsville, distant more than a hundred miles, had driven upwards of three hundred hogs to be fattened on the Pigeons which were to be slaughtered. Here and there the people employed in plucking and salting what had already been procured were seen sitting in the midst of large piles of these birds. The dung lay several inches deep, covering the whole extent of the roosting-place. Many trees, two feet in diameter, I observed were broken off at a great distance from the ground, and the branches of many of the largest and tallest had given way, as if the forest had been swept by a tornado. Everything proved to me that the number of birds resorting to this part of the forest must be immense, beyond conception. As the period of their arrival approached, their foes anxiously prepared to receive them. Some were furnished with iron pots, containing sulphur, others with torches of pine-knots, many with poles, and the rest with guns. The sun was lost to our view, yet not a Pigeon had arrived. Everything was ready, and all eyes were gazing on the clear sky which appeared in glimpses amidst the tall trees. Suddenly there burst forth a general cry of ‘Here they come!’ The noise which they made, though yet distant, reminded me of a hard gale at sea, passing through the rigging of a close-reefed vessel. As the birds arrived and passed over me, I felt a current of air that surprised me. Thousands were knocked down by the pole-men. The birds continued to pour in. The fires were lighted, and a magnificent, as well as wonderful and almost terrifying sight presented itself. The Pigeons, arriving by thousands, alighted everywhere one above the other, until solid masses were formed on the branches all round. Here and there the perches gave way under the weight with a crash, and, falling to the ground, destroyed hundreds of birds beneath, forcing down the dense groups with which every stick was loaded. It was a scene of uproar and confusion. I found it quite useless to speak, or even to shout to those persons who were nearest to me. Even the reports of the guns were seldom heard, and I was made aware of the firing only by seeing the shooters re-loading. No one dared to venture within the line of devastation. The hogs had been penned up in due time, the picking up of the dead and wounded being left for the next morning’s employment. The Pigeons were constantly coming, and it was past midnight before I perceived a decrease in the number of those that arrived. The uproar continued the whole night, and, as I was anxious to know to what distance the sound reached, I sent off a man accustomed to perambulate the forest, who, returning two hours afterwards, informed me he had heard it distinctly when three miles distant from the spot. Towards the approach of day the noise in some

measure subsided ; long before objects were distinguishable the Pigeons began to move off in a direction quite different from that in which they had arrived the evening before, and, at sunrise, all that were able to fly had disappeared. The howling of the wolves now reached our ears, and the foxes, lynxes, cougars, bears, racoons, opossums, and polecats were seen sneaking off, while Eagles and Hawks of different species, accompanied by a crowd of Vultures, came to supplant them, and enjoy their share of the spoil.

“It was then that the authors of this devastation began their entry among the dead, the dying, and the mangled. The Pigeons were picked up and piled in heaps, until each had as many as he could possibly dispose of, when the hogs were let loose to feed on the remainder.”

Precisely the same slaughter takes place in the nesting-places of the Passenger Pigeon, and Audubon goes on to describe these localities in the following manner :—

“The breeding of the Wild Pigeons, and the places chosen for that purpose, are points of great interest. The time is not much influenced by season, and the place selected is where food is most plentiful and most attainable, and always at a convenient distance from water. Forest trees of great height are those in which the Pigeons form their nests. Thither the countless myriads resort, and prepare to fulfil one of the great laws of nature. At this period the note of the Pigeon is a soft ‘coo-coo-coo-coo,’ much shorter than that of the domestic species. The common notes resemble the monosyllables ‘kee-kee-kee-kee,’ the first being the loudest, the others gradually diminishing in power. The male assumes a pompous demeanour, and follows the female, whether on the ground or on the branches, with spread tail and drooping wings. The body is elevated, the throat swells, the eyes sparkle. He continues his note, and now and then rises on the wing, and then flies a few yards to approach the fugitive and timorous female. Like the Domestic Pigeon and other species, they caress each other by billing, in which action the bill of one is introduced transversely into that of the other, and both parties alternately disgorge the contents of their crops by repeated efforts. These preliminary affairs are soon settled, and the Pigeons commence their nests in peace and harmony. They are composed of a few dry twigs, crossing each other, and are supported by forks of the branches. On the same tree from fifty to one hundred nests may frequently be seen ; I might say a greater number, were I not anxious that, however wonderful my account of the Wild Pigeon is, you may not feel disposed to refer it to the marvellous. The eggs are two in number, of a broadly elliptical form, and pure white. During incubation the male supplies the female with food. Indeed, the tenderness and affection displayed by these birds towards their mates, are in the highest degree striking. It is a remarkable fact that each brood generally consists of a male and a female. The young are fed by the parents in the manner described above ; in other words, the old bird introduces its bill into the mouth of the young one in a transverse manner, or with the back of each mandible opposite the separations of the mandibles of the young bird, and disgorges the contents of its crop. As soon as the young birds are able to shift for themselves they leave their parents, and continue separate until they attain maturity ; by the end of six months they are capable of reproducing their species.

“Here, again, the tyrant of creation, man, interferes, disturbing the harmony of this peaceful scene. As the young birds grow up, their enemies, armed with axes, reach the spot, to seize and destroy all they can. The trees are felled and made to fall in such a way that the cutting of one causes the overthrow of another, or shakes the neighbouring trees so much that the young Pigeons or Squabs, as they are named, are violently hurled to the ground. In this manner also immense quantities are destroyed.”

Wilson thus describes the breeding-places in detail :—“When the Passenger Pigeons have frequented one of these places for some time, the appearance it exhibits is surprising. The ground is covered to the depth of several inches with their dung ; all the tender grass and underwood destroyed ;

the surface strewed with large limbs of trees broken down by the weight of the birds clustering one above another; and the trees themselves, for thousands of acres, killed as completely as if girdled with an axe. The marks of this desolation remain for years on the spot, and numerous places could be pointed out where, for several years after, scarcely a single vegetable made its appearance. By the Indians such a breeding-place is considered an important source of national profit and supply during the season, and all their active ingenuity is exercised on the occasion.

“Not far from Shelbyville, in the State of Kentucky, there was one of these breeding-places, which stretching through the woods in nearly a north and south direction, was several miles in breadth, and was said to be upwards of forty miles in extent. In this tract almost every tree was furnished with nests, wherever the branches could accommodate them. The Pigeons made their first appearance there about the tenth of April, and left it altogether with their young before the twenty-fifth of May. As soon as the young were fully grown, and before they left the nests, numerous parties of the inhabitants from all parts of the adjacent country came with wagons, axes, beds, and cooking utensils, many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery. Several of them informed me that the noise in the woods was so great as to terrify their horses, and that it was difficult for one person to make another hear without bawling in his ear. The ground was strewed with broken limbs of trees, eggs, and young Squab Pigeons, which had been precipitated from above, and on which herds of hogs were fattening. Hawks, Buzzards, and Eagles were sailing about in great numbers, and seizing the Squabs from their nests at pleasure; while, from twenty feet upwards to the tops of the trees, the view through the woods presented a perpetual tumult of fluttering and crowding Pigeons, their wings roaring like thunder, mingled with the frequent crash of falling timber, for now the axe-men were at work, cutting down those trees that seemed to be most crowded with nests.”

Persons unacquainted with these birds might naturally conclude that such dreadful havoc might soon put an end to the species, “but I have satisfied myself,” remarks Audubon, “by long observation, that nothing but the gradual diminution of our forests can accomplish their decrease.” In 1805 there came into New York schooners laden in bulk with Pigeons caught up the Hudson River, which were sold for a cent apiece. A man in Pennsylvania caught in a clap-net in one day, upwards of five hundred dozens, sweeping sometimes twenty dozen or more at a single haul; and in the month of March, 1830, they were so abundant in the markets of New York that piles of them met the eye in every direction.

The TURTLE DOVES (*Turtures*) constitute a very numerous section, whose members are all recognisable by their slender body, small head, long wings and tail, and the comparative length of their feet, which enables them to walk over the surface of the ground. The plumage is usually of a reddish hue, and in most species adorned by a broad line around the throat. This band is either black or spotted black and white.

The various members of this group inhabit almost every portion of the globe, Asia and Africa being particularly rich in species. In their habits they resemble other Pigeons, but are readily distinguished from them by the peculiarities of their flight and cry. The Turtle Doves are of a social disposition, and frequently assemble in large flocks, which fly over large tracts of the surrounding country, after the manner of the Passenger Pigeons of North America, described above. Brushwood or groves of low trees are the situations which they principally frequent, though many species also occupy the moist depths of primeval forests, and evidently prefer such localities as are in the immediate vicinity of water. The carelessly-constructed nest is usually placed in low brushwood, at but a little distance from the ground.

THE TURTLE DOVE.

The TURTLE DOVE (*Turtur auritus*) possesses a slender body, straight beak, slightly compressed at the tips of both mandibles, long, weak-toed feet, long wings, in which the second and third quills exceed the rest in length, and a very decidedly rounded, long tail. The feathers on the back are brownish grey, edged with brown and spotted with black and grey in the centre; the top of the head and nape are light greyish blue, the sides of the throat adorned with four black streaks, bordered with silvery white; the throat, region of the crop, and upper breast are deep red, the rest of the under side is purplish grey, shading gradually into greyish white; the primary quills are blackish grey, the secondaries greyish blue, the shoulder-feathers of a blackish hue, broadly edged with rust-red. The eye is brownish yellow, the eye-ring blueish red, the beak black, and the foot carmine-red. This species is eleven inches long and nineteen and a half broad; the wing measures six and a half and the tail five inches.

The Turtle Dove is spread over the whole continent of Europe, even very far northward, but is not found within the Arctic Circle. In the autumn it visits the shores of the Mediterranean, going still farther southward as the season advances. It feeds on grain and vegetables, frequenting fields of corn and peas. The note is a soft and mournful "coo," often uttered when the bird is on the ground. The Turtle Dove is merely a summer visitor to the British Islands, arriving in April or May. It is more numerous in the southern and midland than in the northern counties, but it has been seen both in Scotland and Ireland. It frequents woods and fir plantations, and also thick hedges of ploughed fields.

The nest of this species is placed in the forked branch of an oak, in a fir-tree, or near the top of a tall thick bush. Both parents sit by turns, the male sometimes feeding his mate, and both combining to procure food for their young. In England, only one brood is produced during the year. In the autumn, the Turtle Doves fly in parties of ten or twelve, departing at the close of the fine season to winter in Africa.

Jerdon tells us that among the Indian species the Ashy Turtle Dove most resembles that of Great Britain.

The INDIAN RING-DOVES (*Streptopelia*) have a shorter and less abruptly rounded tail than that possessed by the members of the above group; the line around the neck completely encircles it, and the general coloration of the plumage is of a lighter shade. They are all remarkably beautiful birds.

THE INDIAN RING-DOVE.

The INDIAN RING-DOVE (*Streptopelia risoria*) has a somewhat shorter and less decidedly rounded tail than the Turtle Dove. The plumage of this species is principally of creamy yellow, darkest on the back, and with the head, throat, and belly of a light shade; the neck is decorated with a black collar; the quills are of a blackish hue; the eye is light red, the beak black, and the foot carmine-red. The length of this bird is twelve and its breadth twenty inches; the wing measures six inches and a half, and the tail five inches.

The western part of India, Ceylon, Yemen, Arabia, and a great portion of Eastern Africa form the habitat of the Indian Ring-dove. Reichenbach, it is true, discredits the statement of Le Vaillant and other writers who have described this bird as being met with in Africa, and supposes that they mistake for it a nearly-allied species: we can, however, positively assert, on our own experience, that this Ring-dove has been observed not only near Aden, but in Africa, namely, in Samchara and the forests near the Blue River, and that in extraordinary numbers. We are certain we are not mistaken



TURTLE DOVES.

as to the identity of the species, as we killed and closely examined many African specimens in their native haunts, and found them in every respect like such as inhabit Asia.

This species is generally diffused throughout India, where it frequents hedges and trees in the neighbourhood of cultivated districts, and also low bush or reed jungle; it is also found in Ceylon, but is rare in Malabar and the countries east of the Bay of Bengal. Layard notices its partiality for euphorbia bushes, on which, he says, it generally builds its nest.

Like the other Doves, it breeds in the plains at all seasons, it also appears to ascend the hills near Mussoora to breed there in spring. The "coo," says Blyth, is quite different from that of the domestic Turtle Dove, and may be expressed by "kookoo-koo, kookoo-koo."



DWARF PIGEON (*Chalcopelea Afra*).

THE DWARF PIGEON.

The DWARF PIGEON (*Chalcopelea Afra*), a small and delicate species found in Africa, represents a group recognisable by their short, rounded tail, high tarsi, and the very remarkable metallic coloration of the upper secondary quills. In this bird the sombre olive-brown mantle is relieved by a yellowish sheen; the top of the head is grey; the brow and throat are whitish; the under side is reddish grey, with belly of a very pale tint, and black rump. The quills are blackish brown, with cinnamon-red roots and inner web; the metallic patches on the plumage gleam with deep blueish black; the centre tail-feathers are olive-brown, and those at the exterior black. The eye is red, the beak blackish, and the foot yellowish red. This species is seven inches and a quarter long. The wing measures four and the tail three inches.

The Dwarf Pigeon inhabits the southern and eastern parts of Africa, rarely appearing, according to our own observations, farther north than sixteen degrees north latitude. Amongst the forests in the

vicinity of the Blue River we met with it constantly, as also in the well-wooded valleys of the Samchara and Abyssinian mountains. In these situations it almost invariably frequents the shelter of thick brushwood, never ascending to the summits of lofty trees, and only quitting its leafy concealment for a few minutes at a time, for the purpose of drinking. The immediate vicinity of water is an indispensable necessity to these birds, and where this is to be found they frequently confine their movements within the limits of a few yards, provided the neighbouring bushes and parasitical plants afford them a constant supply of the various seeds upon which they rely for subsistence. In disposition they are peaceful and unsocial, each pair keeping apart, and never congregating even in small parties. Like most members of this family, the male exhibits the utmost tenderness towards his mate. The nest, which is built indifferently in low bushes close to the ground, on fallen tree trunks, or in hollow trees, resembles that of other Pigeons, but is somewhat stronger, and more neatly built. In Soudan the period of incubation commences with the rainy season. The solitary egg we were able to obtain was found on the fourteenth of January, and had a yellowish white shell.

The GROUND PIGEONS pass their entire lives upon the ground, and are remarkable for the length of their legs. These birds have short or moderate-sized wings, and powerful, high tarsi. The tail is variously formed, being sometimes short, quite straight, slightly rounded, or much prolonged, and wedge-shaped. The members of this group are met with in all parts of the globe except the continent of Europe.

The AMERICAN GROUND PIGEONS (*Zenaidæ*), as Bonaparte has named such of these birds as inhabit America, have a powerful body, short wings, and long, well-developed legs. The various species comprised in this group are met with in all parts of that continent, but are especially numerous in the south. In their general habits they seem to occupy a position intermediate between Pigeons and Rasoreal Birds, and some of them strikingly resemble certain Partridges.

The SINGING DOVES (*Melopeleia*) have comparatively long wings, a moderate-sized tail, and plumage much resembling that of the Turtle Dove. The region of the eye is bare. Of these the best known is

THE KUKULI.

The KUKULI (*Melopeleia meloda*) is a species inhabiting South America. This bird has reddish brown plumage, shaded with yellow. The crown of the head is deep brown; the under breast and belly are of greyish hue; the wings dark brown, bordered with greyish white; the tail-feathers blackish grey tipped with white. Under the ear is an oval black spot, and the sides of the neck are decorated with patches of metallic brilliancy. The eye is blackish blue; the eye-ring, or, rather, broad, bare cheek-stripe, is deep blue; the beak black, and the foot red. This species is twelve inches long. The wing measures six inches and three-quarters.

We are without any detailed account of the life of this Pigeon, but are indebted to Tschudi for a short communication respecting it in his "Travels in Peru." "The Kukuli," he writes, "one of the largest species of Pigeon, is a great favourite in this country, and much kept in cages. Its song, which is monotonous, but very melodious, is continued up from the earliest hours of the morning till mid-day, and is re-commenced at sunset. The song consists merely of a threefold repetition of the syllables 'cu-cu-li.' Some of these birds repeat 'cu-cu-li' more than thrice, and their price increases according to the number of their uninterrupted repetitions, which seldom exceed five or six. In Coackacra, however, I heard one of these birds that repeated its 'cu-cu-li' fourteen times, and the owner would not sell his favourite for a less price than fourteen ounces of gold."

The SPARROW PIGEONS (*Pyrgitænas*), the smallest members of the entire order, are strongly-built birds, with a short neck and small head. Their wings, in which the second quill is the longest, are of medium length; the tail, composed of twelve feathers, is comparatively short, and rounded at its tip; the short beak is straight and delicate, the foot small, and the tarsus bare.

THE SPARROW PIGEON, OR GROUND DOVE.

The SPARROW PIGEON, OR GROUND DOVE, as it is called in North America (*Pyrgitænas passerina*, or *Columba passerina*), is principally of a greyish brown, with dark grey crown of head and nape. The rump is dull brownish grey, and the breast whitish; the feathers on the breast and fore part of the throat are edged with deep brown; the quills are dark brown, with brownish red inner web; the tail-feathers black, those at the exterior bordered with white on the outer web; the feathers on the wing-covers are enlivened by round spots of metallic lustre. The eye is bright orange, the beak pale red, deepest in shade at its tip; the foot is reddish brown. The Ground Dove is six inches and a half long, and ten inches and a quarter broad. The wing measures three inches and a quarter, the tail two inches and a third.

This species, which is the smallest, most delicate, and inoffensive of all Doves, is a native of the West Indian Islands and the Southern States of North America. In the northern parts of that continent it visits the country near the coast only during the course of its migrations. In Jamaica, on the contrary, it remains throughout the entire year, living in small parties of from four to twenty birds, and frequenting grassy plains or pasture land.

"The flight of the Ground Dove," says Audubon, "is low, easy, and accompanied by a whistling sound, produced by the action of the wings when the bird is surprised and forced to fly; but it seldom flies more than one hundred yards at a time, and, indeed, is extremely attached to the spot it has selected for the season. You may drive it to the opposite end of a field, and yet in a few hours after it may be found in the place whence you raised it. Although it alights on trees or low bushes, on the branches of which it walks with ease, the ground is its usual resort. There it runs with facility, keeping its tail considerably elevated, as if to prevent it from being soiled. It is also fond of alighting on fences, where it is easily observed, and where it may be heard cooing for half an hour at a time. These Pigeons are met with in groups of four or five, and it is seldom that more than a dozen are seen together. They prefer the thinly-grained, sandy portions of cotton-fields, pea-patches, and such places. In East Florida they are seen in the villages, and resort to the orange-groves about them, where they frequently breed." "I have found them," continues our author, "in the famous Spanish fort of St. Augustine, where I have been surprised to see them rise almost perpendicularly to reach above the parapets, by which they insured their escape. They are easily caught in traps, and in that place are sold for six and a quarter cents each. They readily become domesticated, and, indeed, so very gentle are they that I have seen a pair that have been caught at the time when their young ones were quite small, and placed in an aviary, at once cover their little ones, and continue to nourish them until full grown. They afterwards reared a second brood, and showed great spirit in keeping the Jays and Starlings away from their charge. The Ground Doves were fed on rice and other grain."

The nest of this species is large and compact, the exterior formed of dry twigs, with a lining of grass disposed in a circular form. The eggs, deposited in April, are two in number, and of a pure white; usually two, sometimes three broods, are reared in the season. The male struts before the female after the manner of the Barbary Ringed Dove.

"I met with some of these birds," says Audubon, "on Sandy Island, six miles from Cape Sable. They were so gentle that I approached them within less than two yards. Their nest was placed on

the top of a cactus, not more than two feet high." In a wild state these Pigeons feed on various small berries and grass seeds, with which they pick up a considerable quantity of small gravel. They also dust themselves with sand, lying down in it after the manner of Partridges.

The SPARROW-HAWK PIGEONS (*Geopelia*) are small, graceful birds, remarkable for their slenderness of form and length of tail. Their wings are short and rounded, the tail graduated, and the plumage striped.

THE STRIPED SPARROW-HAWK PIGEON.

The STRIPED SPARROW-HAWK PIGEON (*Geopelia striata*) has light brown plumage; all the



THE KUKULI (*Melopeleia meloda*).

feathers on the mantle and under side being striped with black; the brow and throat are dark grey, the belly and rump whitish; the quills and feathers of the centre part of the tail-covers of a metallic brown, delicately sprinkled with black towards their roots, and pure white at their extremities. The eye is light brown, the beak pale, and the foot dark yellow. This species is nine inches long, its wing measures three inches and three-quarters.

The Sunda and Molucca Islands must be regarded as the native land of this Pigeon, which is, however, numerously met with not only in the neighbouring countries, but in Europe. In Java it is very highly esteemed as a domestic favourite, its voice being supposed to act as a charm against witchcraft. Many writers speak of this bird as peculiarly interesting when in captivity, but, although it possesses a sweet pleasing voice, we have been unable to discover anything attractive in its habits. Such caged birds as we have observed were extremely quiet, remaining almost motionless throughout the day, and only coming down from their perch to eat or drink.



Plate 21. Gmelin's Book of Birds

AMPHICTON ——— TYNCHUS ——— AMERICAN

PLATE 21

THE SPECKLED OR WEDGE-TAILED TURTLE DOVE.

The SPECKLED OR WEDGE-TAILED TURTLE DOVE (*Stictopeleia cuneata*) belongs to a group of birds inhabiting the continent of New Holland, distinguishable from the Pigeons above described by their superior length of tail, in which the five outer pairs of feathers are progressively shortened, and by their spotted plumage. The head, throat, and breast are grey; the back and shoulders cinnamon-brown; the feathers on the wing-covers deep grey, and those on the shoulders decorated with two white spots, surrounded by a black line; the belly and feathers on the lower wing-covers are white;

THE STRIPED SPARROW-HAWK PIGEON (*Geopelia striata*).

the quills brown, with a reddish inner web; the four centre tail-feathers are grey, with black extremities; the rest greenish black at the root and pure white at the tip. The eye is bright red, the bare circle round the eye pale scarlet or greenish yellow; the beak deep olive-brown, and the foot reddish brown, or yellowish. The female is smaller than her mate, and of a more decided brown on the head, throat, and back; the spots on her wing are also fewer, and less clearly defined. The length of this bird is seven inches and three-quarters, the wing measures three inches and a half, and the tail four inches and one-third.

“All that we read or imagine of the softness and innocence of the Dove,” says Captain Sturt, “is realised in this beautiful and delicate little bird. It is common on the Murray, and in various parts of the interior of Australia. Two remained with us at the depôt in latitude $39^{\circ} 40'$, longitude 142° , during a greater part of the winter, and on one occasion roosted on my tent-ropes,

near a fire. The note of this species is exceedingly plaintive, and, although softer, much resembles the coo of the Turtle Dove."

"The Little Turtle Dove," says Gould, "is more frequently observed on the ground than among the trees. I sometimes met with it in small flocks, but more often in pairs. It runs over the ground with a short bobbing motion of the tail, and while feeding is so remarkably tame as almost to admit of its being taken by the hand; if forced to take wing it merely flies to the nearest tree, and there remains motionless among the branches. I not unfrequently observed it close to the open doors of the huts of the stock-keepers of the interior."

The nest is a frail and beautiful structure, formed of the stalks of a few flowering grasses, crossed and interwoven. "One sent me from Western Australia is composed," says Gilbert, "of a small species of knotted everlasting plant (*Composita*), and was placed on the overhanging grasses of the *Xanthorrhæa*. During my first visit to this part of the country, only two situations were known as places of resort to this species, and I did not meet with more than four or five couples; since that period it has become exceedingly abundant, and now a pair or two may occasionally be seen about most of the settlers' houses on the Avon, becoming apparently very tame, and familiarised to man. This bird utters a rather singular note, which at times somewhat resembles the distant crowing of a cock. The term *Men-na-brun-ka* is applied to it by natives, from a traditionary idea that the bird originally introduced the *men-na*, a kind of gum which exudes from a species of acacia, and which is one of the favourite articles of food among the natives."

The RUNNING PIGEONS (*Geotrygoncs*) are heavy, and powerfully framed, with rounded wings, the first primary quill of which is often much shortened; high, thick tarsi, and short toes. All the species belonging to this group occupy Southern and Central America.

THE PARTRIDGE DOVE.

The PARTRIDGE DOVE (*Starnænas cyanocephala*), the most remarkable of these birds, has a thick-set body, short wings, the slender, sabre-formed quills of which are pointed at the extremity, the third and fourth being longer than the rest, and a moderately long and rounded tail; the high, broad, and very strong beak is vaulted at its culmen; the feet are long, with thick tarsi and short fleshy toes, armed with large and very decidedly hooked claws. The plumage is dense, and the cheek-stripes bare, overspread with small, oval warts. A beautiful chocolate-brown predominates in the coloration of the feathers, shading into reddish brown on the mantle, and into rich deep red upon the breast. The crown of the head and a few scale-like feathers on the throat are slate-blue; the face, nape, and throat, black; the cheek-stripes, and a line on the lower part of the throat, pure white; the wings dark brown, edged with reddish brown, and shaded with deep grey on the lower side; the centre tail-feathers are chocolate-brown, and those at the sides blackish brown. The eye is dark brown; the beak bright coral-red at the base and greyish blue at the tip; the foot is pale reddish white, with horny plates of deep carmine-red; the toes are deep blueish red, and the skin between them sky-blue. This species is twelve inches long and seventeen broad; the wing and tail each measure five inches.

The island of Cuba must be considered as the native country of these splendid birds, from whence they spread northwards to Florida, southwards to Venezuela. They appear, according to Burmeister, to approach the upper tracts of land near the river Amazon, but do not come farther southwards. It is questionable if they are found in Jamaica. Gosse says, "The Spanish Partridge Dove (*Cyanocephala*) is not considered as indigenous in Jamaica, though it is frequently imported thither from Cuba." Audubon met with several of them in Florida, and states that "A few of these

birds migrate each spring from the island of Cuba to the keys of Florida, but are rarely seen, on account of the deep tangled woods in which they live. Early in May, 1832, while on a shooting excursion, I saw a pair of them on the western side of Key West. They were near the water, picking gravel, but on our approaching them they ran back into the thickets, which were only a few yards distant. Several fishermen and wreckers informed us that they were more abundant on the Mule Keys, but although a large party, including myself, searched these islands for a whole day, not one did we discover there. I saw a pair which I was told had been caught when young on the latter keys, but I could not obtain any other information respecting them than that they were fed upon cracked corn and rice, which answered the purpose well."

Grundlach tells us that the nest of the Partridge Dove is built of twigs and placed amongst the parasitical plants that entwine themselves around the branches of their favourite forest trees. We are without any reliable information concerning the manner of incubation or the appearance of the eggs.

The BRONZE-WINGED PIGEONS (*Phaptes*) also pass a considerable portion of their lives upon the ground, but, unlike the preceding, are furnished with short tarsi and long toes. All are of comparatively large size, and most species powerfully framed, though in some instances their length of tail gives them a somewhat slender appearance. The beak is strong, the wings generally long and pointed, and the tail composed of from fourteen to sixteen feathers of various sizes. The variegated plumage is enlivened by a strong metallic brilliancy. The members of this beautiful group inhabit Oceania.

THE CRESTED BRONZE-WING.

The CRESTED BRONZE-WING (*Ocyphaps lophotes*), the most striking member of the family, has a slender body, moderately long, pointed wing, and long, graduated tail, formed of fourteen feathers, and wedge-shaped at its extremity. The short beak is hooked at the tip, and the low foot has its centre toe almost as long as the tarsus; the back of the head is decorated with a long, pointed plume. The head, face, breast, and under side are grey; the crest is black, the mantle light olive-brown, shading into red on the sides of the head; the large feathers on the wing-covers are of a glossy, metallic bronze-green, edged with white; the quills brown, narrowly bordered with brownish white, and partially tipped with white; the centre tail-feathers are light brown, the rest of a deeper shade, with a greenish sheen on the outer web and white tips. The eye is orange-red, the bare skin around the eye red, the beak deep olive, with a brown base and black tip, the foot red. The length is thirteen inches and a half, and that of the wing and tail six inches each.

"The chasteness of its colouring," says Mr. Gould, "the extreme elegance of its form, and the graceful crest which flows from its occiput all tend to render this Pigeon one of the most lovely members of its family, and it is therefore to be regretted that owing to its being exclusively an inhabitant of the interior of Australia it can never become an object of general observation. As might be supposed, this bird has attracted the notice of all travellers who have crossed the Blue Mountains." Captain Sturt mentions it as being numerous on the plains of Wellington Valley and in the neighbourhood of the Morumbidgee. "The locality nearest the coast-line that I know it to inhabit is the country near the bend of the river Murray, in South Australia, where it is tolerably abundant. It is numerous on the banks of the Namoi, and is occasionally seen on the Liverpool Plains. It frequently assembles in very large flocks, and when it visits the lagoons or river-sides for water, during the dry seasons, generally selects a single tree, or even a particular branch, on which to congregate before descending simultaneously with its companions to drink."

"Its flight is so rapid as to be unequalled by that of any member of the group to which it belongs. An impetus being given by a few quick flaps of the wing, it goes skimming off, apparently

without any further movement of the pinions. Upon alighting on a branch it elevates its tail and throws back its head so as to bring them nearly together, at the same time erecting its crest and showing itself to the utmost advantage."

The nest of this species is built on low trees or bushes, and is very slightly formed of a few twigs. The eggs are white and two in number. According to Captain Sturt, this bird has a particular partiality for the *Polygonum geranium*, never ascends to higher land if near extensive marshes covered with this plant, and is always found in river-valleys where it grows.



THE CRESTED BRONZE-WING (*Ocyphaps lophotes*).

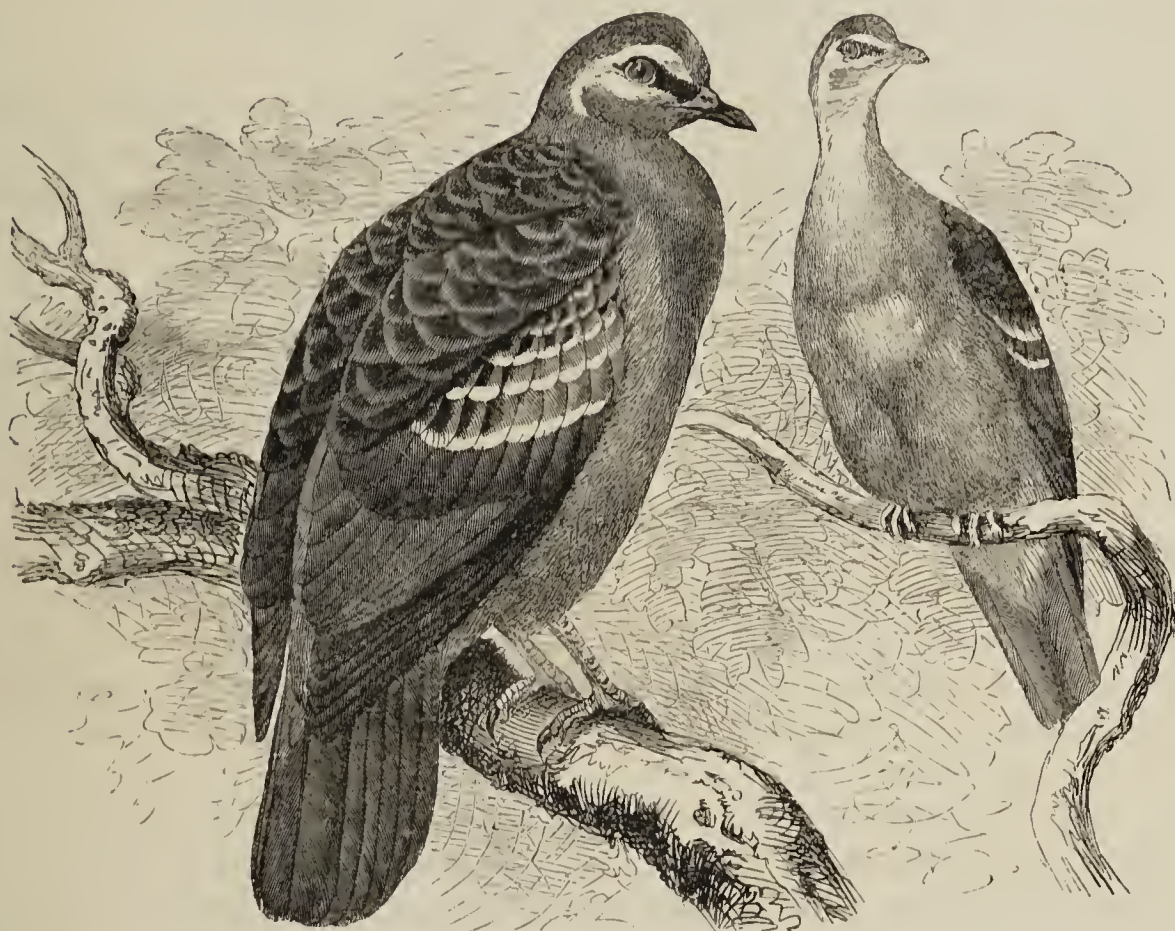
The TRUE BRONZE-WINGS (*Phaps*) are stoutly-framed birds, with long wings and short tails; their beak almost equals the head in length; the powerful tarsus is shorter than the middle toe, and the second and third quills in the pinions are longer than the rest.

THE COMMON BRONZE-WING.

The COMMON BRONZE-WING (*Phaps chalcoptera*) is brown on the mantle, deep brown at the back of the head, and a rich deep red on the under side, shading into grey on the belly; the brow and a line under the eyes and on the throat are yellowish white; the sides of the throat are grey; the feathers on the wing-covers adorned with oval copper-bronze patches, and two or three of the secondary quills with glossy green spots; the centre tail-feathers are brown, the rest deep grey. The eye is dark reddish brown, the beak blackish grey, and the foot carmine-red. The female is without the light streak upon her brow; her plumage is also greyer, and has fewer bright metallic spots than that of her mate.

The Bronze-winged Pigeon is very generally distributed in all parts of Australia ; in some it would seem to be stationary, while in others it is said to be migratory.

“It is,” says Mr. Gould, “a plump, heavy bird, weighing when in good condition fully a pound, and is constantly eaten by every class of persons resident in Australia. Its amazing powers of flight enable it to pass in an incredibly short space of time over a great expanse of country, and just before sunset it may be observed swiftly winging its way over the plains or down the gullies to its drinking-place. During the long drought of 1839-40, when I was encamped at the northern extremity of the Brezi range, I had daily opportunities of observing the arrival of this bird to drink, the only water for miles, as I was assured by the natives, being in the immediate vicinity of my tent, and that merely the



THE BRONZE-WINGED PIGEON (*Phaps chalcoptera*).

scanty supply left in a few small natural basins in the rocks, which had been filled by the rains of many months before. This peculiar situation afforded me an excellent opportunity of observing not only the Bronze-wing, but many other birds inhabiting the neighbourhood. Few if any of the true insectivorous or fissirostral birds came to the water-holes, but on the other hand those species that live upon grain and seeds, particularly the Parrakeets and Honey-eaters (*Trichoglossi* and *Meliphagi*), were continually rushing down to the edges of the pools, utterly regardless of my presence, their thirst entirely overcoming their sense of danger. Seldom if ever, however, did the Bronze-wing make its appearance during the heat of the day, but at sundown it arrived with arrow-like swiftness, either singly or in pairs. It did not descend at once to the edge of the pool, but dashed down to the ground at about ten yards distance, remained quiet for a short time, then walked leisurely to the water, and after drinking, winged its way to its roosting-place. With a knowledge, therefore, of the habits of this bird, the weary traveller may always know when he is in the vicinity of water ; and however arid the appearance of the country may be, if he observes the Bronze-wing wending its way

to a given point, he may be certain to procure a supply of water. When rain has fallen in abundance, and the rivers and lagoons are filled, the case is materially altered; then the Bronze-wing and other birds are not so easily procured."

It is supposed that a partial exodus of these birds takes place from time to time, which Gould thinks very probable. After the termination of the breeding season, both young and old resort to the stubble-fields, and from twenty to thirty brace may be daily killed. This species feeds entirely on the ground, upon a variety of leguminous seeds. It breeds in August and the four succeeding months, and often rears two or more broods. The nest is usually placed on the horizontal branch of an apple or gum tree near the ground, especially on those growing in flat meadow-land in the neighbourhood of water. The nest, which is very frail, is made of small twigs, and of rather hollow form. The two eggs are white, an inch and three-eighths in length, and an inch in breadth.

The QUAIL PIGEONS (*Geophaps*) differ from the above birds principally in the comparative shortness of their powerful beak, their small, rounded wing, high tarsus, and the bare circle that surrounds the eye. The members of this group inhabit Australia, and breed upon the ground.

THE PARTRIDGE BRONZE-WING.

The PARTRIDGE BRONZE-WING (*Geophaps scripta*) is light brown on the mantle and breast; the rest of the under side is grey, shading into white, except on the yellowish brown belly. The quills and feathers of the wing-covers have light edges, the outer web of many of the larger feathers gleaming with greenish purple; the throat, upper breast, a broad line from the lower mandible to the eyes, and a spot on the sides of the throat are snow-white, adorned with very peculiar black markings resembling printed letters. The eye is dark brown, the eye-ring blueish grey, the beak black, and the foot deep, rich red. The length is twelve inches; that of the tail five and a half inches.

"This Pigeon," says Gould, "has more than ordinary claims to the attention both of the ornithologist and the epicure, since to the first it is of interest as being a typical example of a minor group of the *Columbæ*, whose habits and economy are very peculiar, and to the second as a most delicate viand for the table.

"It is to be regretted that a bird possessing such high qualifications as an article of food should be so exclusively a denizen of the plains of the interior of Australia that it is available to few except inland travellers, for it would be of especial interest to the sportsman from its offering a closer resemblance to the *Gallinacæ* than any other Pigeon. I sometimes observed it in pairs, but more frequently in small flocks of from four to six in number, which, when approached, instead of seeking safety by flight, ran off with exceeding rapidity in an opposite direction and crouched down either on the bare plain or among any scanty herbage that appeared to offer the best shelter, where they often lay until all but trodden on."

When this Pigeon does rise, it flies with extreme rapidity, making a loud burring noise with the wings, and generally spinning off to another part of the plain, or to the horizontal branch of a tree, on which it immediately squats in the same line as the branch, from which it is not easily distinguished or driven off.

The two eggs are placed on the bare ground without any trace of nest. The nestlings run and fly when only the size of a Quail. The food of this bird principally consists of seeds of grasses and small plants, and in some seasons insects and berries. Water seems quite an essential to its existence; and many writers inform us that it is abundant on such plains as are intersected by rivers and water-holes.

Gould met with this bird on the Liverpool Plains, and as he proceeded on the Lower Namoi its

numbers seemed to increase ; it is said to be equally abundant on the banks of all rivers between New South Wales and the Murray, in South Australia. Mr. Gould has never observed it in collections from the northern or western parts of that continent ; thus it would appear to be limited to the south and east.

The WHITE-FLESHED PIGEONS (*Leucosarcia*) are recognisable by their powerful, compact build ; long, round beak ; short, shell-shaped wings ; moderate-sized, rounded tail, and very long tarsi.

THE WONGA-WONGA PIGEON.

The WONGA-WONGA PIGEON (*Leucosarcia picata*) is of a greyish hue on the mantle, and white on the brow, throat, and under side. The sides of the head are light grey ; the bridles, a triangular patch and two broad lines on the upper part of the head are black ; the feathers on the sides of the belly are decorated with dark, triangular, metallic spots ; the anterior wing-feathers are brown, the outer tail-feathers white at the tip, and the feathers of the lower tail-covers dark brown, becoming lighter towards their tips ; the eye is dark brown, the beak purplish black, and the foot of a reddish shade. The length of this species is fifteen inches ; the wing measures seven inches and a half, and the tail five inches and a quarter.

The Wonga-wonga Pigeon is an inhabitant of Australia, where, seeing its value as an article of food, it is by no means so plentiful as could be wished.

“This Pigeon,” says Gould, “must always be an object of interest, from its large size, and its white flesh rendering it a great delicacy for the table, in which respect it is second to no member of its family, the only one at all approximating it being the *Geophaps scripta*. It is to be regretted that a bird possessing so many qualifications should not be generally dispersed over the country, but such is not the case. To look for it on the plains or in any of the open hilly parts would be useless, no other districts than the brushes which stretch along the line of coast of New South Wales, or those clothing the sides of the hills of the interior, being favoured with its presence. The same kind of situations that are suited to the Brush Turkey (*Tallegallus Lathamii*), the Menura, and the Satin Bird are equally adapted to the Wonga-wonga. Its distribution over Australia mainly depends upon whether the surface of the country be or be not clothed with that rich character of vegetation common to the south-eastern portion of the continent. As the length of its tarsi would lead one to expect, this species spends most of its time upon the ground, where it feeds upon the seeds and stones of the fallen fruits of the towering trees under whose shade it dwells, seldom exposing itself to the rays of the sun or seeking the open parts of the forest. While traversing these solitudes, the explorer is frequently startled by the sudden rising of the Wonga-wonga, the noise of whose wings is not very different from that made by the rising of a Pheasant. Its flight is not of long duration, its wings being merely employed to remove it to a sufficient distance to enable it to avoid detection by again descending to the ground or mounting to the branch of a neighbouring tree. I had frequent opportunities, continues Mr. Gould, of personally observing it at Illawarra, on the low islands at the mouth of the river Hunter, and in the cedar brushes of the Liverpool range. During my encampment in those parts I shot them whenever an opportunity occurred, for the purpose of eating.” We have no precise information respecting the nidification of this important bird.

THE HACKLED GROUND PIGEON.

The HACKLED GROUND PIGEON (*Callenas Nicobarica*) is a powerfully-built bird, with a strong beak, furnished with a soft, conical excrescence at its base ; the feet approximate the gallinaceous type, having stout tarsi and short toes ; the long wings when closed extend almost to the tip of the rounded

tail, which is composed of twelve broad feathers. The plumage is richly coloured, and so prolonged around the throat as to form a complete mane or collar. The head, throat, entire under side, and wings are blackish green; the feathers on the lower part of the body edged with blue; the longest of the collar-feathers, back, rump, and feathers of wing-covers are grass-green, with a metallic lustre, the shorter collar-feathers being of a glossy golden hue, and those of the tail pure white. The eye is light reddish brown, the beak blackish and the foot reddish purple. The length is fourteen inches, the breadth across the wings twenty-nine inches; the wing measures nine inches and a half, and the tail two inches and two-thirds.

This beautiful bird, according to Jerdon, is met with on the Andaman and Nicobar Islands, the



THE HACKLED GROUND PIGEON (*Callenas Nicobarica*).

Merqui Archipelago, the Philippines, and Malaya generally, usually preferring to settle upon the small, unoccupied islands. Though, like its congeners, it possesses considerable powers of flight, it seeks the grain and insects that afford it the means of subsistence almost exclusively on the ground, upon which it passes the entire day, only leaving its surface to seek a perch, whereon to sleep. We are without particulars respecting the incubation of this Pigeon, except that, like the Partridge, it builds its nest upon the ground.

The CROWNED PIGEONS (*Goura*), as the largest members of the family of Pigeons are called, inhabit New Guinea and the neighbouring islands. These birds exceed the Domestic Fowl in size, and are remarkable for a fan-like crest with which the head is adorned. Their body is stout; their wings, in which the secondary quills exceed the primaries in length, are long and much rounded at the tip; the beak is about half as long as the head, the foot furnished with long tarsi and short toes, and the slaty-blue plumage very soft in texture.

THE CROWNED PIGEON.

The CROWNED PIGEON (*Goura coronata*) is principally of a slate-blue colour, with chestnut-red shoulders and white stripes on the centre of the wing; the tail-feathers terminate in a white stripe. The eye is yellowish scarlet, the back dull grey, and the foot red, powdered with white. The length of this bird is twenty-eight inches; the wing measures fourteen and a half and the tail ten inches.

THE VICTORIA CROWNED PIGEON (*Goura Victoria*).

These birds, we learn from Wallace, inhabit the coast of New Guinea in large numbers, as also the Islands of Waigiu, Salawati, and Misool. In their habits they resemble Pheasants, living upon the ground, and wandering about the woods in small parties in search of fallen fruit. If alarmed, they at once take refuge upon the low branch of a tree, and in this situation they also sleep. The nest found by Rosenberg was very loosely constructed, and contained but one fledgling. Large numbers of these birds are exported alive to Java, Amboyna, and Banda, and from thence to Europe; from this practice has arisen the idea that the species is indigenous to those islands. When in confinement the Crowned Pigeons soon become tame, and learn to attach themselves to those who feed them. In

the Zoological Gardens in the Regent's Park there are several specimens, whose manners are very curious and interesting.

"Their walk," says the Rev. J. G. Wood, "is quite of a royal character—stately, majestic, and well according with the crown they wear upon their heads. The crest seems always to be held expanded. They have the habit of sunning themselves upon the hot pavement of their prison by lying on one side, laying the head flat on the ground, tucking the lower wing under, and spreading the other over their bodies, so as to form a very shallow tent, each quill-feather being separated from its neighbour and radiating around the body. Sometimes the bird varies this attitude by stretching the other wing to its full length, and holding it from the body at an angle of twenty degrees or so, as if to take advantage of every sunbeam and waft of air. While lying in this unique attitude it might easily pass at a distance for a moss-covered stone, a heap of withered leaves, or a rugged tree-stump, with one broken branch projecting from its side; no one would think of taking it for a bird."

THE VICTORIA CROWNED PIGEON.

The VICTORIA CROWNED PIGEON (*Goura Victoriae*), the second member of this group with which we are acquainted, is also principally of a slaty blue colour, but has a reddish brown under side; the wing-stripes are blueish grey, and a broad line at the end of the tail whitish grey. In this bird the feathers that form the crest terminate in small fan-like appendages. The eye is reddish, and the foot flesh-pink. This Pigeon is somewhat larger than the species last described. It inhabits the most southern parts of North Guinea, and is nowhere very numerous.

THE DIDUNCULUS, OR TOOTHED PIGEON.

The DIDUNCULUS, or TOOTHED PIGEON (*Didunculus strigirostris*), is an extraordinary bird, representing a family of Pigeons possessing a powerful body, moderately long neck, and large head. The beak, which is much higher than it is broad, has the upper mandible arched and hooked at its extremity, its margins being smooth; the tip of the curved under mandible, on the contrary, is furnished with three tooth-like indentations. The tarsus is strong, partially bare, and longer than the centre toe; all the toes are unconnected, and armed with broad hooked claws. The rounded wings extend, when closed, almost to the end of the moderate-sized and slightly-rounded tail. The head, throat, breast, and belly of this species are of a glossy greenish black; the hinder portions of the under side, the wings, tail, and feathers on the lower wing-covers rich, deep chestnut-brown; the quills are greyish black, and all the feathers on the upper part of the mantle decorated with a brilliant green spot at their tips; the lower back, wings, tail, and feathers of the lower tail-covers are of a beautiful dark chestnut-brown, and the quills greyish black. The eye is blackish brown; the bare patch that surrounds it and the cheek-stripes bright orange-red; the beak is also orange-red, with light yellow tip; the feet red, and the claws yellowish white. The length is twelve inches and a half, and breadth twenty-four inches; the wing measures seven inches, and tail three inches.

The first description of the *Didunculus* was published by Sir William Jardine, in the "Annals and Magazine of Natural History." "We are," he says, "indebted to Lady Harvey, who purchased it at Edinburgh, for a specimen of this bird;" and adds, "We are aware of no existing description, though there is one allusion made to a bird which may turn out to be this. In Mr. Strickland's 'Report on the Present State of Ornithology,' it is stated that in the recent American voyage of discovery Mr. Titian Peale had discovered a new bird allied to the Dodo, which he proposed to name *Didunculus*."

The subject remained in this state till 1862, when Dr. Bennett communicated his observations on this Pigeon to the *Sydney Morning Herald*. This communication was subsequently published in the *Proceedings of the Zoological Society of London*, from which the following account is taken:—

“The Rev. John B. Stair,” says Dr. Bennett, who formerly resided for some time at the Navigator group of islands, which are believed to be the exclusive habitat of this singular bird, “informed the Secretary of the Acclimatisation Society of Victoria that it is named by the natives *Manua-mea* or Red Bird, from the predominant colour of its plumage being chocolate-red. It was formerly numerous, and therefore we may be surprised that it should not have been seen and procured by the early navigators. Now it is nearly extinct. It feeds on plantains, and is partial to the fruit of the *soi*, a species of *Dioscorea*, or yam, a twining plant abundant in these islands, and producing a fruit resembling a small potato. In disposition it is exceedingly shy and timid. Like the Ground Pigeons, it roosts on bushes or stumps of trees, and feeds on the ground; it also builds its nest in such situations. During the breeding season both parents aid in the work of incubation, relieve each other with great regularity, and are so intent on the performance of their duty that when sitting on the eggs they may be easily captured by hand. Two living birds were obtained in this way by Mr. Stair. They are also taken by the natives with birdlime or springes, and shot with arrows, the sportsman concealing himself near an open space in which a quantity of the *soi*, their favourite food, had been placed.”

“The first living bird obtained was accidentally killed; the second, when placed in confinement, was sullen, and refused food, but soon became reconciled to captivity, and thrived well. The natives fed it upon boiled taro (the root of the *Caladium esculentum*), rolled into oblong pellets, in the same manner as they fed their pet Wood Pigeons and Doves. The power of wing of most of the Pigeon tribe is very great, a circumstance which also obtains in this bird. It flies through the air with a loud noise, like the Top-knot Pigeon (*Lopholaimus antarcticus*), of the Illawarra district, and many other of the Australian Pigeons; and Mr. Stair describes it as making so great a noise with its wings on rising, that when heard at a distance it resembles the rumbling of distant thunder, for which it might be mistaken.”

In a second communication, made to the same society, by Dr. Bennett, in 1863, he speaks of another living specimen of this rare bird brought to Sidney by Mr. Williams. “It was,” he says, “at first rather shy and wild, but afterwards became more tame, and manifested but little fear; this feeling was, however, occasionally exhibited by the utterance of rapid ‘coos,’ and by fluttering its wings. It is a stupid-looking bird, and has no particular attraction except in the anomalous and extraordinary form of the beak, which cannot fail to attract the attention of the most ordinary observers. The only sound it utters is a quick ‘coo-coo-coo,’ the beak being always open when the sounds are emitted. The bird was captured about five miles from Apia, in the Island of Upola; it is evident, therefore, that a few still remain there. It is, however, agreed by every one with whom I have conversed who has resided at the Navigators’ Islands, that it is nearly extinct, both from being eaten by the natives, as well as owing to the attacks of cats, rats, and other vermin. Its food consisted at first of boiled yams, but it will eat bananas, apples, bread, and boiled potatoes.”

In a third paper, read by Dr. Bennett in 1864 at a meeting of the Zoological Society, he says:—“In the contour of the bill, the form and position of the nostrils, and several other characters, the *Didunculus* differs from any other living species yet known. Although a smaller bird, it approximates in all its characters to the extinct Dodo, and, like it, combines the characters of a rapacious bird with those of the harmless Pigeon. Although the mandibles are powerful, yet the beak is never used as an offensive weapon, for when the hand is placed in the cage, or the bird is seized for removal from one cage to another, it never attempts to bite, but, on the contrary, is so timid that, after fluttering about or running into a dark corner, it soon becomes subdued and is easily taken.”

Of a living pair purchased by Dr. Bennett, he says: "They would nibble into minute bits the seeds of loquats, almonds, and hempseed, with the same action as a Parrot when feeding. When I first had them, boiled potatoes and bread formed their diet; the former, being soft, were torn and swallowed in large pieces, but the latter they placed under their feet and tore with their hooked beak into small bits. It was supposed that these birds never drink water; this I soon found to be incorrect. They invariably feed in the light, but will not take food if any one be present. They run with great rapidity, elongating the body and depressing the head, and in the action of running resemble Grouse."

Another specimen, purchased at a high price by Dr. Bennett, was presented by him to the Zoological Gardens, London, where it lived for several months. Its skin is now in the British Museum. Of this bird Dr. Bennett says that, while in his possession, "it never became domesticated, nor evinced the slightest attachment to the lady who fed it; it was the same to her as to strangers." Dr. Bennett does not consider the *Didunculus* a bird which could be readily reconciled to captivity; "for some time it would be comparatively tame, and then, without any apparent cause to account for the change, it would become very wild." Walpole says that the *Didunculus* makes its nest on the ground, and that both parents incubate the eggs.

TRUE GALLINACEOUS BIRDS.

The TRUE GALLINACEOUS BIRDS are so named because they present a general resemblance, both in their structure and habits, to our common Barn-door Fowls. They are usually of a moderate or rather large size, and of a stout and somewhat heavy build. They have a small head, often partially or wholly denuded of feathers, and a bill of moderate length, of which the upper mandible is distinctly arched and overhangs the lower, both at the tip and along the margins. As they are all essentially terrestrial in their habits, their legs are always strong and well-developed. The tarsi are stout, and very commonly armed with a spur, or even with two or more such weapons, which are especially developed in the males. The toes are three in front and one behind, the latter being usually small and slightly elevated on the back of the tarsus, but sometimes more elongated, and then placed upon the same level as the other toes, so as to be efficient in grasping. The anterior toes are not very long, but stout, and often united by webs at their base; they are armed with strong, but rather blunt nails, which are of great use in scratching up the ground in search of food—a habit common to most of the species, from which, indeed, many ornithologists give them the name of RASORES, or SCRAPERS. The feathers of the legs are continued down to the articulation of the tarsus, and sometimes extend beyond this point, even to the extremities of the toes. The wings are generally short and weak in comparison with the weight of the body, so that they fly heavily and only to short distances. Their plumage is firm and often adorned with brilliant colours, and parts of it, especially in the males, are frequently developed to an extraordinary extent, sometimes giving them a grotesque appearance. The feathers are remarkable for the great development of the accessory plumules springing from the base of the stem at its junction with the quill.

The members of this order are spread over all parts of the world, but the finest species are inhabitants of the warmer regions. The *Gallinæ* may be generally described as being the order more especially set apart by their great Creator for the service of man. Hence they are more easily domesticated than any other birds; their flesh is the most palatable, and their fecundity the greatest. They live almost entirely on the ground, which consequently affords them their chief nourishment in

the seeds and grains of different plants. Their flesh and eggs are universally wholesome and very nutritious, while their feathers are employed for a variety of uses. They are peculiarly attentive to their offspring; and that the increase should keep pace with the wants of man, they are much more prolific than ordinary birds. They are social, live in societies, and are polygamous. They prefer escaping from danger by running, and only take to flight when compelled by necessity. They are fond of rolling in the dust; some nestle on the ground and live only on plains, while others reside in



SAND GROUSE.

forests, and always make their nests on trees. The young are usually able to run as soon as they leave the egg, but at night, or on the approach of danger, they shelter themselves under the wing of their mother.

The SAND GROUSE (*Pteroclae*) differ in so many essential particulars from allied groups as to make it necessary to regard them, not merely as forming a family, but a distinct tribe of birds, the peculiarity of whose habits, movements, and plumage render them eminently fit to enjoy life in the desert places and sandy wastes which they frequent. The principal characteristics of the *Pteroclae* or Sand Grouse, are a short body, much-arched breast, neck of moderate length, and small, delicate head. The beak is short, slightly arched at its culmen, and compressed at its sides in such a manner as to make it almost round; the lower mandible becomes thicker towards its tip, the nostrils, situated at the base of the bill, and concealed by the feathers on the brow, are open above, and

partially covered by a skin. The tarsi and toes are small, the latter in some species connected by a skin as far as the first joint; the hinder toe is very slightly developed or entirely wanting. The claws are short, slightly bent, blunt, and broad; the bones supporting the wings are comparatively short, but the quills very long; the tail is formed of from fourteen to eighteen feathers, and is usually either rounded or wedge-shaped at its extremity; in some species, however, the two centre feathers are of considerable length. The plumage, composed of short, broad, rounded, and very stiff feathers, has a smooth appearance, although in reality it is somewhat lax, and its coloration is such as best accords with the earth or sand of the localities these birds are intended to occupy. The sexes usually differ in the coloration of their plumage; the young at first resemble the mother, but very soon attain their adult garb. The *Pterocla* are only met with in the Eastern Hemisphere, and are particularly numerous in Africa, whilst in Europe, owing to the small extent of their favourite barren tracts, they are comparatively rare. Africa and Asia have their distinct species, which usually remain throughout the entire year in their native lands; owing, however, to their great power of wing, they are capable of flying to a considerable distance, and often make their appearance in countries very remote from each other. One species alone migrates annually.

THE GANGA, OR LARGE SAND GROUSE.

The GANGA, or LARGE SAND GROUSE (*Pterocles arenarius*), one of the largest members of the group, is of a reddish grey on the head, shading into a somewhat deeper tint at the nape; the mantle is mottled with light or dark yellow and slate-grey, each feather having a round yellow spot at its tip; the throat is ochre-yellow, a band upon its lower portion brownish black; the breast is reddish grey, and has a very clearly defined streak on its surface, which is black or brownish black, as is the belly; the quills are grey or greyish blue, tipped with brownish black above and deep black beneath; the secondaries are white at the roots; some of the feathers on the upper wing-covers are partially of a pure, unspotted ochre-yellow, and those of the lower covers white; the two centre tail-feathers are reddish brown, striped with pale black; the rest are deep grey, tipped with white above, and coal-black on their lower surface. The feathers on the upper tail-covers are mottled like the back, and those on the lower covers spotted black and white; the plumage on the feet is of a dark brownish yellow. The eye is deep brown, the beak dull blueish grey. Both sexes are about thirteen and a half inches long, and from twenty-six to twenty-seven inches broad; the wing measures eight inches and three-quarters, and the tail four inches. The female is of a sandy yellow over the entire back and sides of the throat, each of the mantle-feathers being striped with blackish brown, and those on the head, neck, throat, and upper breast marked with small dark spots: the bands upon the throat and breast are comparatively indistinct, and the brown and black belly paler than that of the male bird.

The Ganga is met with in North-western Africa, and occasionally in the most southern countries of Europe; in Asia it is very numerous, appearing regularly in India during the cold season. "This fine Sand Grouse," says Jerdon, "is only a winter visitant to India, arriving towards the end of September and leaving in March. It frequents extensive open sandy plains, flies in vast flocks, being said to be more abundant than *P. exustus* in those parts where it does occur. Like the others of this tribe, it goes regularly twice a day to certain spots on the banks of rivers or tanks to drink, and it is fond of basking in the sun and rolling on the sand. One writer records that he saw these birds leave their roosting-places among sand-hills about sunrise, and collect in thousands on a hard bare plain, close to where they usually drank, but that they were neither feeding nor drinking at that early hour, and came there, he suggests, for the sake of basking in the early rays of the sun. This species seeks its food on grassy plains and also on stubble-fields, and does so immediately after drinking."

The flight of this Sand Grouse, we are told, is amazingly strong and rapid, and when roused it

flies to great distances. In disposition it is generally shy and wary, and difficult to approach closely, from the open nature of the country it affects. It is highly esteemed as a game bird, and much sought after by many sportsmen, as well from the difficulty of the chase as for its qualities on the table. It is stated that, from the closeness and firmness of its plumage, it takes a good gun and heavy shot to bring it down. A writer records the preponderance of one sex in every flock, sometimes seven or eight females and not one male being killed, and *vice versâ*. The flesh is mixed white and brown on the breast, and although somewhat tough when fresh, and perhaps requiring to be skinned, is considered delicious eating; indeed, one authority states that it is the finest game bird for the table in India. Shooting these Grouse from a hole dug in the ground is said to be a very deadly way of making a good bag. They are caught in the neighbourhood of Peshawur and other places in horse-hair nooses. Adams, when at Peshawur, towards the end of the year, noticed the arrival of this species and also of the *P. exustus*. Their guttural voices were frequently heard among the sounds giving notice of cold weather. Both kinds were often seen in flocks during the day, and seemed to be regular migrants.

The eggs of this Sand Grouse, usually three, occasionally four in number, are, according to the Arabs, deposited on the sand or bare ground; whilst Adams, on the contrary, maintains that this species excavates a small hole wherein to place the brood, and raises a circle of dry grass around its outer edge.

THE LARGE PIN-TAILED GROUSE, OR KHĀTA.

The LARGE PIN-TAILED GROUSE, OR KHATA (*Pterocles alchata*), is somewhat smaller than the Ganga, and has the feathers more highly coloured. Like that bird, the plumage is principally of a sandy yellow, the brow and sides of the cheeks being reddish brown, the throat and a delicate line commencing at the eye and passing to the back of the head are black; the nape and the back brownish-greyish green, spotted with yellow; the small wing-covers greyish crimson, their upper feathers striped with reddish brown, then with light yellow, and again with deep brown; the feathers of the larger covers are greyish-greenish yellow, bordered with blackish brown; the lower part of the throat is reddish fawn-colour; the upper breast bright crimson-brown, surrounded above and below by a narrow black line, and the belly white. The quills are grey, with black shafts shading beneath to a deeper tint; the shoulder-feathers are greenish grey above and fawn-grey on the lower surface; most of the tail-feathers are striped grey and yellow on the outer, and grey tipped with white on the inner web; while the long centre pair are greenish grey, marked with faint stripes. The plumage of the female resembles that of her mate, but is readily distinguished by the stripes upon her mantle, a double line upon her throat, enclosing a patch of greyish yellow, and by the white hue of its upper portion. The eye is brown, the beak dark grey, and the foot of a brownish shade. The length of the male is twelve inches and three-quarters, the breadth twenty-two inches and a half; the wing measures seven inches, and the tail five inches. This well-known Sand Grouse inhabits Northern Africa, Western Asia, and the south of Europe, especially Spain, Sicily, and the Levant, and it occasionally penetrates through Central Asia to the Punjaub and Scinde.

“The Khata,” says Jerdon, “is a comparatively rare bird in India, only a few finding their way across the Sutlej. I presume that, like *P. arenarius*, it is migratory to this country, and only found in the cold season.” It is a very beautiful bird, and the bill is thicker and stronger than that of any other of the genus.

This species has a peculiar call, resembling the syllables “kaa-kia,” and not unlike the cry of the Jackdaw. It flies in flocks of from ten to seventy, or more, and is said to be very shy and wary, and more difficult to approach than the Large Sand Grouse. Its specific appellation is taken from its Arabic name, *El-chata* or *El-katta*, which, however, is also applied to *P. arenarius*. It breeds amor;

rocks in Central and Western Asia, Northern Africa, and the south of Europe, laying four or five eggs of a reddish grey colour, with brownish spots. We are told that it swarms in countless hosts in Palestine, and Mr. Blyth believes, with justice, that this bird, rather than the *Coturnix communis*, is the "Quail" of the Israelites. Colonel Chesney, indeed, writes of it as "a kind of Quail about the size of a Pigeon, which at times literally darkens the air with its numbers;" and Burckhardt tells us that the number of Khatas in the stony district beyond the Jordan is beyond description; the whole plain seems sometimes to rise and fly off in the air in masses, that appear like large moving clouds. In the mountains of Edom they so abound that two or three are often killed at a time by a



THE KHATA (*Pterocles alchata*).

stick thrown among them by the Arab boys. At some seasons of the year an ass-load may be taken at one shutting of the clasp-net. "This species," according to Tristram, "abounds in the central and southern districts of the Great Sahara, and in winter may be seen in packs or in large flocks. There is scarcely," he observes, "a bird in nature which surpasses the male *Pterocles alchata* in softness of colouring or delicacy of pencilling. Alas!" he adds, "that such handsome plumage should clothe such very dry bones. Their flesh being black and hard, is never seen at the table of the Franks, but is nevertheless eaten by the Turks. The Khata lays two or three eggs at a time, merely placing them on the ground. In size they resemble those of a Pigeon, and have a greenish black shell. The Arabs eat them fried in butter."

THE COMMON SAND GROUSE.

The COMMON SAND GROUSE, or ROCK PIGEON OF INDIA (*Pterocles exustus*), the third species of this group, is principally of a beautiful reddish cream-colour, shading into bright yellow on the face,

cheeks, and wing-covers, and overspread with a bright greenish gloss upon the back ; the deep reddish-brown lower breast and belly are divided from the upper portion of the plumage by a narrow black line, which commences at the sides of the throat, and passes across the breast ; the lower tail-covers and feathered tarsi are cream-colour, the small feathers of the wing-covers have a line of reddish brown at the tip, the primary quills are black, all except the three outermost having the tip and inner web white ; the very long, slender, and sharply-pointed centre pair of tail-feathers are of a yellowish shade, and those at the exterior dark brown, spotted and striped with a paler tint. The eye is dark brown, the bare circle that surrounds it lemon-yellow ; the beak and toes are lead-grey.



THE COMMON SAND GROUSE (*Pterocles exustus*).

This species is thirteen inches long and twenty-three broad, the wing measures seven and a half, and the tail from five and a half to six inches. The markings upon the back of the female are darker than in the plumage of the male bird ; the head, nape, and throat are greyish, darkly spotted ; the breast band is paler, the belly striped black and brown. The centre tail-feathers are only a trifle longer than the rest.

“This,” writes Jerdon, “is the most common and abundant species of Sand Grouse throughout India, being found in every part of the country except the more wooded portions, and never occurring in forest districts. It is therefore quite unknown in Malabar, in the wooded districts of Central India, and in Lower Bengal, and neither this, nor either of the previous species, as far as is known, occur to the eastwards, in Assam, Sylhet, or Burmah. Out of India, it is common through great part of Central and Western Asia and Northern Africa, and, it is stated, has been met with, though rarely, in

Europe. This Sand Grouse frequents the bare open plains, whether rocky or otherwise, and is very partial to ploughed lands and bare fallow fields. It feeds chiefly in the morning, and between eight and nine a.m. goes to drink at some river or tank, at which in certain parts of the country thousands assemble, and may then be seen winging their way in larger or smaller parties from all quarters, at a great height, uttering their peculiar, loud, piercing call, which announces their vicinity to the sportsman long before he has seen them. They remain a few minutes at the water's edge, walking about and picking up fragments of sand or gravel, and then fly off as they came. In the hot weather, at all events, if not at all seasons, they drink again about four p.m. When they are seated on bare sand or rock they are most difficult to observe, from the similarity of their colour to that of the ground; sometimes they can be approached with ease near enough to get a good shot, at other times, especially if in large flocks, they are shy and wary. A small flock or single birds can often be approached very close by walking rapidly, not straight, but gradually towards them; in this way I have often walked up to within two or three yards of them. They feed on various hard seeds, especially on those of various *Alysicarpi*, *Desmodium*, &c., as well as on grass, seeds, or grain."

These Sand Grouse breed in the Deccan and Southern India from December to May, and in Central India still later. In some parts of the country, as at Mhow and Saugor, most of them leave the district after breeding in July, and do not return till the end of the rains. The eggs are laid on the bare ground, three or four in number, of cylindrical form, nearly equally thick at both ends, of a greenish stone-colour, thickly spotted with grey and brown. This species, if kept long enough, is very excellent eating, though the flesh is somewhat hard and tough, but with a high game flavour. The young birds, when nearly full-grown, are most excellent.

THE STRIPED SAND GROUSE.

The STRIPED SAND GROUSE (*Pterocles Lichtensteinii*) has the mantle and under side of a light greyish yellow, delicately striped with black; the brow and fore part of the head are whitish, and divided in the centre by a black line, that passes from the base of the bill to the top of the head, which, like the region of the cheek and the throat, is marked with dark spots instead of stripes. The mantle is enlivened by numerous bright yellow, crescent-shaped spots, and the upper breast decorated with a broad band of light brownish yellow, through which pass two lines, the one dark brown and the other light grey; the primaries are deep brown on the outer, and light brown on the inner, web; the secondaries brown at the root, with pure white outer web and black tip; the rounded tail—the centre feathers of which do not exceed the rest in length—is reddish yellow, each feather being delicately striped with black. The eye is dark brown, and the skin around it sulphur-yellow. The beak is dull orange; and the fore parts of the foot are copper-colour. This species is ten inches and two-thirds long, and twenty-one inches and a half broad; the wing measures seven and the tail two inches and a half. The female is without the dark line on the brow, and the reddish brown band upon her breast; her plumage is greyish yellow, striped very uniformly with delicate black lines. The Striped Sand Grouse, which closely resembles its congeners in its habits, is, according to Jerdon, common in Arabia, and occurs as a straggler in Scinde and the Punjaub.

PALLAS'S SAND GROUSE.

PALLAS'S SAND GROUSE (*Syrrhaptes paradoxus*), the representative of a group inhabiting Asia, is distinguished by the long bristle-like point in which the first wing-quill terminates, and by the shortness of its toes; these latter—three in number—are very broad, and so connected by a fold of skin as to present, when seen from beneath, the appearance of a foot-sole without toes. The claws are broad and strong, and the connecting skin covered with horny warts.

This Sand Grouse is fifteen inches long, without including the longest tail-feathers, and twenty-three inches broad, exclusive of the bristle-like wing-quills ; the wing measures seven inches, and the tail four inches and a half, or seven inches inclusive of its central tail-feathers. The female is shorter and more slender than her mate. In this species, the top of the head and a line that commences at the eyes and passes over the sides of the throat are dark grey ; the region of the head is separated from the greyish yellow breast by a band formed of delicate black and white lines ; the upper belly is brownish black, its lower portion and the feathers of the middle tail-covers light grey ; the throat, brow, a broad stripe over the eyes, and the back are clay-yellow, the latter striped with a deeper shade. The quills are dark grey, those at the exterior being bordered with black on the outer, and the rest with grey on the inner web ; the shoulder-feathers are of a brownish hue, edged with yellow, and tipped with white, and those on the inner wing-covers yellowish brown, tipped with blackish brown ; the plumage on the tarsi is yellowish white. The female is without the band upon her breast, and is of a paler shade upon the face and lower belly ; her plumage is also rather spotted than striped.

These singular looking birds, respecting whose habits we have only recently received reliable information, inhabit Southern Europe, Africa, and Asia, living in dry sandy deserts, bare or rocky plains, or bushy or woody grounds, and are especially numerous in the neighbourhood of low hills. They are usually met with singly, or in pairs, except when such as occupy the desert plains resort to water, which they do in flocks. When flushed, they rise with a low chuckling call, fly for a short distance, and then alight. If followed, they run along the ground for a few steps, and with difficulty rise again. "Others, however," Dr. Smith tells us, "fly to a great height and suddenly descend, when they approach the water on their feeding grounds ; sometimes this descent is not commenced till they are directly over the spot on which they purpose to alight. On such occasions they are obliged to make a circular or semi-circular sweep, before they can reach the desired locality." Their food consists of hard seeds, bulbs, and insects, mixed with fine gravel. The two eggs which are deposited on the bare ground are elliptical in form, about seventeen or eighteen lines long by twelve or thirteen lines broad at their centre, and have a greenish-greyish yellow shell, marked, dotted, and streaked with various shades of greyish brown ; in some instances one end of the egg is decorated with a wreath of spots.

The GROUSE TRIBE (*Tetraonidae*) constitute the richest group of the entire order. These birds have a compact body, short neck, small head, and short powerful beak, with a thick base. The foot is short, the tarsus moderate ; the wing of medium length, and usually much rounded ; the tail is generally straight, but in some instances pointed or incised at its extremity. The thick plumage in most species extends over the entire body, even to the toes ; some few also exhibit bare patches of brightly-tinted skin. The sexes are nearly alike in colour. The members of this tribe inhabit almost every latitude of the globe.

The GROUSE PROPER (*Tetraones*) are recognisable by their powerful, compact bodies, short, or moderate-sized wings, and short straight tail ; the latter, however, is occasionally long, and either wedge-shaped or forked at its extremity. The bill is strong, thick, short, and much vaulted, and the foot low and powerful, with more or less well-feathered tarsus. The plumage is thick and rich, the brow and nape often exhibit bare patches, covered with small horny plates of a bright red colour. The toes of some species are covered with a short and remarkable horny growth.

These birds are met with throughout the whole of Europe, Asia, and North America, but are quite unknown in Africa. All are, without exception, stationary in their habits, and rarely undertake



PALLAS'S SAND GROUSE, OR SAND GROUSE OF THE STEPPES.

expeditions to any great distance from their native haunts. During the period of incubation they live alone or in pairs, but at other times in parties, which often unite into large flocks. Their food consists of fruits, seeds, the young shoots of plants and trees, insects, and larvæ. Some species are polygamous, but many pair; in the latter case, at least, both males and females assist in rearing the young. Although by no means highly endowed, the *Tetraones* have their sense of sight and hearing well developed. They walk quickly, but fly heavily, and with much noise, resorting but rarely to this means of progression, and never rising to any height in the air. The increase of these birds is very rapid, the female laying from eight to sixteen eggs, oval in shape, smooth, yellowish, and spotted with brown. No actual nest is prepared for their reception, a slight hollow in the earth, carelessly lined with some soft material, being all that is required for the purpose, provided that the situation is sufficiently retired to secure the safety of the young. We are told by several Swedish naturalists that not only are these birds subject, like their congeners, to many changes of plumage, but that they cast their claws, and at the same time the horny fringes with which their toes are defended.

THE CAPERCALI.

The CAPERCAILLIE, CAPERCAILZIE, or CAPERCALI (*Tetrao urogallus*), the largest and finest species of the above group, is of a blackish hue on the crown of the head and throat; the nape is deep grey, marked with undulating black lines; the back pale black, powdered with grey and reddish brown; the tail black, spotted here and there with white; the breast glossy steel-green, and the rest of the under side spotted more or less distinctly with black and white. The eye is brown, the bare skin that surrounds it bright red, and the beak greyish white. This noble bird is from two feet two inches to two feet five inches long, its breadth being from four feet four inches to four feet seven inches; the wing measures from fifteen to seventeen, and the tail from thirteen to fourteen inches.

“The Capercali,” says Mr. Lloyd, “is to be found in most parts of the Scandinavian peninsula; indeed, as far to the north as the pine-tree flourishes, that is to say, very near to the North Cape itself. These birds are, however, very scarce in the more southern of the Swedish provinces. The favourite haunts of the Capercali are extensive fir-woods. In coppices or small covers they are seldom or never to be found.” Professor Nilsson observes that such as breed in the larger forests remain there all the year round, but those on the contrary that breed on the sides of elevated mountains, or in more open parts of the country, in the event of deep snow, usually descend to the lower grounds.

The principal food of the Capercali, when in a state of nature, consists of the leaves and tender shoots of the Scotch fir (*Pinus sylvestris*). He very rarely feeds upon those of the spruce (*Pinus abies*). He also eats juniper-berries, blue berries, and other berries common to the northern forests, and also, occasionally in the winter time, the buds of the birch, &c. The young Capercali feed principally at first on ants, worms, and insects.

In the spring of the year, and often when the ground is still deeply covered with snow, the cock stations himself on a pine, and commences his love song, or *play*, as it is termed in Sweden, to attract the hens about him. This performance is usually carried on from the first dawn of day to sunrise, or from a little after sunset, until darkness has set in. The time, however, more or less depends upon the mildness of the weather, and the advanced state of the season. During his play the neck of the Capercali is stretched out, his tail is raised and spread like a fan, his wings droop, his feathers are ruffled up, and, in short, he much resembles in appearance an angry Turkey-cock. He begins his play with a call, something resembling the words “Peller, peller, peller.” These sounds he repeats at first at some little intervals; but, as he proceeds, they increase in rapidity, until at the last, and after perhaps the lapse of a minute or so, he makes a sort of gulp in his throat, and finishes by drawing in his breath. During the continuance of this latter process, which only lasts a

few seconds, the head of the Capercali is thrown up, his eyes are partially closed, and his whole appearance would denote that he is worked up into an agony of passion.

“On hearing the call of the cock, the hens, whose cry in some degree resembles the croak of the Raven, or rather, perhaps, the sound of ‘gock, gock, gock,’ assemble from all parts of the surrounding forest. The male bird now descends from the eminence on which he was perched to the ground, where he and his female friends join company.

“The Capercali does not play indiscriminately over the forest, but has certain stations, which may be called his playing grounds. These, however, are often of some little extent; and here, unless very much persecuted, the call of these birds may be heard in the spring, year after year, for years together. The Capercali does not during his play confine himself to any particular tree, and is seldom met with on the same spot for two days in succession. On these playing grounds several Capercali may occasionally be heard playing at the same time. Old male birds will not permit young birds, or those of the preceding season, to play. Should the old birds, however, be killed, the young ones, in the course of a day or two, usually open their pipes. Combats, as may be supposed, not unfrequently take place on these occasions, though I do not recollect having heard of more than two of these birds being engaged at the same time.”

“The Capercali hen makes her nest upon the ground, and lays from six to twelve eggs; these are two inches three lines long, by one inch eight lines in breadth, and of a pale reddish yellow-brown, spotted all over with two shades of darker orange-brown. It is said she sits for four weeks; her young keep with her until the approach of winter, but the cocks separate from the mother before the hens. When the females really commence incubation, they are forsaken by the old males, who skulk about among the brushwood while renewing their plumage, the female alone attending to the hatching and rearing of her progeny.”

“Except there be deep snow upon the ground,” says Mr. Lloyd, “the Capercali is much upon the ground in the daytime; very commonly, however, he sits in the pines, sometimes on the very uppermost branches. During the night he generally roosts in the trees; but if the winter be very cold, he not unfrequently buries himself in the snow. Considering the large size of the bird, his flight is not particularly heavy or noisy; indeed, I have not only seen the Capercali at a very considerable height in the air, but I have known him to take a flight of several miles at a time. During the winter he is in most instances to be seen perched on the very uppermost branches of the pines.”

“The Capercali lives to a considerable age; at least, so we infer from the cocks not attaining their full growth until their third year, or upwards. The old ones may be easily known from their greater bulk, their eagle-like bill, and the more beautiful glossiness of their plumage. The size of these birds, I have reason to suppose, depends in a great degree on the latitude where they are found.”

Pennant, in his “British Zoology,” speaking of the Capercali, says, “This species is found in no other part of Great Britain than the Highlands of Scotland north of Inverness, and is very rare even in those parts. In our country I have seen one specimen, a male, killed in the woods of Mr. Chisholme, to the north of Inverness.”

Of late years successful attempts have been made to restore this bird to Scotland, and in 1836 Mr. Lloyd procured for Sir T. Fowell Buxton forty-nine Capercali, male and female. These he presented to his friend Lord Breadalbane, by whom they were reared with such success that about Taymouth Castle they became as common as the Black Cock, and spread thence over all the more wooded parts of the Highlands as far as Aberdeen, and have grown so tame that a carriage might be driven under the trees on which the hens are perched without their taking the slightest notice.

Although the Capercali is exceedingly shy in its native wilds, it sometimes divests itself of its shyness and approaches people fearlessly; and this, says Mr. Lloyd, in his amusing volume on the

“Game Birds of Sweden and Norway,” “has occasionally given rise in Sweden to the notion that it is actually ‘possessed.’” “About this time last year,” Lieutenant Jack relates, “whilst the cottager Anders Pehrsson, of Bengtsbo, in the province of Westmarland, was collecting brushwood in the forest, a Capercali cock, without showing the smallest apprehension, came and alighted on the ground immediately near him. The old belief in *Troll-Foglar*, or enchanted birds, once so common, and which is still retained by a portion of the peasantry, could not but have its effect on the man from such clear and conclusive evidence. With this crotchet in his head, he therefore hastened to the *Klockare*, or clerk of the parish, named Pettersson, who was also its oracle, residing at a distance of about an English mile from the spot, and related to him what had happened. Pettersson, who professed not to have the most distant apprehension of the *Troll* and their emissaries, at once put his gun in order, and, accompanied by Pehrsson, repaired to the spot indicated, which the Capercali had not yet quitted. The *Klockare* advanced to within a few paces of the bird, and pulled the trigger, but the gun ‘clicked.’ It was cocked a second and a third time, though with the same result. The flint is now hammered, and fire at length produced, though confined to a flash in the pan. The ardour of the sportsman rose to its highest pitch. How provoking! neither pricker nor other instrument to clear the touch-hole. These had been forgotten in the hurry of departure from home. As a substitute a pointed piece of wood is had recourse to; but it breaks short off in the touch-hole, and only makes matters worse. All this while the Capercali remains motionless, a quiet spectator of the enemy’s proceedings. The *Klockare*, on his part, gazes at the bird, and that with a feeling somewhat akin to awe. He is on the point of sharing his comrade’s belief in *förtrollning*, or enchantment. Once more, however, he musters up courage, and, renewing his endeavours, finally succeeds in clearing the touch-hole; fresh priming is then put in the pan, but when all is in readiness, and he is prepared to discharge his piece, the bird, which hitherto had not budged an inch from the spot, suddenly takes wing. Our Nimrod is just about to give vent to his feelings, and pour maledictions on his villainous weapon, when, to his joy, he sees the bird alight on a tree within an easy distance. To place the gun to his shoulder and fire is now the work of a moment, and to the undisguised delight, not to say astonishment, of both our doughty knights of the chase, the old blunderbuss went off with a loud bang, and the Troll-bird gave up the ghost.”

“In Scandinavia,” continues Mr. Lloyd, “the Capercali is in considerable request for the table. It is more palatable, however, during the autumnal months, when it lives for the most part on berries and the like, than in the winter, when its food consists of pine-leaves, which give it a somewhat resinous flavour. In Wermeland and the adjacent country it is a standing dish at the last-named season at the houses of the gentry, who usually lay in an ample supply of these birds at the setting in of the frost. On the occasion of births, marriages, and deaths with the peasantry, the Capercali is looked upon as a needful addition to the feast. With them it is eaten either simply boiled or first parboiled and afterwards roasted until hard as a stone, in which state it will keep for weeks or months.”

The HEATH COCKS (*Lyrurus*) represent a group of slenderly-formed birds, possessing short, arched, and rounded wings, the third quill of which exceeds the rest in length. The tail, composed of eighteen feathers, is in the female very slightly excised at its extremity, but in the male is so deeply forked as to present somewhat the form of a lyre. The powerful beak is of moderate size; the foot has its exterior and inner toes of equal length, and is completely covered with feathers. The very glossy plumage exhibited by the members of this group may be regarded as their most distinguishing characteristic, the male in particular being remarkable for the resplendent brilliance that adorns his feathers.



THE CAPERCALI (*Tetrao uogallus*).

THE BLACK COCK.

The BLACK COCK (*Lyrurus tetrrix*) is principally of a rich black, relieved upon the head, throat, and lower back with a magnificent steel-blue sheen; the wings are enlivened by bands of pure white, the feathers on the lower tail-coverts are also of snowy whiteness; the eye is brown, the pupil blueish black, and the beak black; the toes are greyish brown, the eye brown, and a bare patch around the eye bright red. In the female the prevailing colour of the plumage is a mixture of rusty yellow and rusty brown, marked with transverse stripes and spots of black. The length of the male is nearly two

THE BLACK COCK (*Lyrurus tetrrix*).

feet, and its breadth over three feet; the length of the wing is twelve inches, and that of the tail seven inches. The female is six inches shorter and nine inches narrower than her mate. The young in their first plumage resemble their mother; but in the first moult the black feathers of the young males appear about the sides and breast.

The Black Cock is generally distributed over the European continent, being found in Germany, Holland, France, and, according to Savi, in Italy. In the north, it is met with in Scandinavia, Russia, Siberia, and Lapland. It is said at one time to have been frequent in Ireland, but has long since disappeared. In England it is met with on heathy hills and forest districts, becoming more plentiful toward the borders of Scotland, and is found in considerable abundance in the mountainous and wooded parts of that country. Its favourite haunts are the low slopes of hills, in which brush-wood and coppice alternate with heather and fern, and rocky, well-wooded glens. In spring and summer its food consists of leaf-buds, the tops of heather, berries of various plants growing among the heath, insects, larvæ, and sometimes corn and seeds from the neighbouring fields. In winter this

supply is diminished to the tender tops of shoots of birch, fir, and heath, and vaccinia and juniper berries. In spring and summer, these birds live apart in families, but in the autumn and winter remain together in flocks, which, when snow is on the ground, roam from place to place in search of food.

“Unlike the Capercali, which mostly roosts in trees,” says Mr. Lloyd, “the Black Cock almost invariably passes the night on the ground, and in the winter, more especially if the cold be intense, it not seldom *buries itself in the snow.*” Nilsson indeed supposes that the bird only makes a hollow in the snow and allows itself to be covered by the falling flakes; but Mr. Lloyd assures us that the bird makes a regular burrow for itself, the depth depending, it is generally believed, on the mildness or severity of the weather. “Scores of times,” he says, “when crossing glades and other openings in the forest, where the surface of the snow, to the casual observer, appeared to be as smooth as glass, one or more Black Cocks have suddenly emerged from beneath the snow, almost at my feet, and when expecting every moment others to follow I have carefully looked about me, I never could discover anything beyond the slightest indentation in the snow where the bird had burrowed, the hole itself being filled up by the sides collapsing; and yet perhaps within the next minute half a score of Black Cocks would fly up all around me. That their heads were above the surface previously to their leaving the snow I hold to be impossible, nor can I conceive that even their beaks protruded as others will have it. If air be needful to birds when thus imbedded in the snow, their beak no doubt forms an imperceptible orifice, through which they are enabled to respire.”

In addition to his own experiences in the matter, Mr. Lloyd quotes the observations of the amusing though sometimes “marvel-relating” Bishop Oppidam: “In the winter-time the Black Grouse take care of themselves in this manner: they first fill their craw with as much food as it will hold, till it hangs like a bag under their necks, whereby they are provided for something to live on for some time; then they will drop themselves down into the soft snow and do not stay in their first hole, but undermine and burrow in the snow some fathoms from it; and there they make a small opening for their bills, and thus be warm and comfortable.”

In the warm days of early spring these birds resort to their pairing ground, for unless they have been disturbed, they frequent the same place year after year. “The places selected at such seasons,” says Sir W. Jardine, “are generally elevations, such as the turf enclosure of a former sheep-fold, which has been disused and is now grown over, or some of those beautiful spots of fresh and grassy pasture, which are well known to the inhabitants of a pastoral district. Here, after perhaps many battles have been fought and rivals vanquished, the noble, full-dressed Black Cock takes his stand, commencing at the first dawn of day, and where game is abundant, the hill on every side repeats his humming call; he struts round the spots selected, trailing his wings, inflating his throat and neck, and puffing up the plumage of these parts and the now brilliant wattle above the eyes, raising and expanding his tail and displaying the beautifully contrasting white under tail-covers.” (See engraving, p. 185.)

“While the Cock is thus parading to and fro,” says Mr. Lloyd, “he frequently vaults high into the air, and in doing this ‘slews’ his body round, so that on alighting again his head is turned in an opposite direction.” This season of admiration does not continue long, the females dispersing to seek a place for their eggs, and the males retreating to the shelter of the brushwood or brakes of fern, they are then seldom seen except early in the morning and evening. The nest of the “Grey Hen,” as the female is commonly called, is very simple, being merely a hollow in the ground sheltered by a low bush or tuft of grass; the eggs are from six to twelve in number, about two inches long, and of a yellowish white colour, spotted and dotted with yellowish red. The mother has the entire charge of the young, both during and after incubation, and most zealously does she defend her trust, acutely distinguishing friends from foes, as the following anecdotes from the *Zoologist* will prove:—

“As Mr. W. S. Hurrel was crossing the hill between Carr Bridge and the Spey, on a fishing excursion, with some of his dogs following, one of them pointed, when a Grey Hen offered to do battle in defence of her brood, and flapping her wings like fanners, she with heroic bravery actually beat her canine antagonist and drove him crest-fallen away. Mr. Bass, M.P., and his friends who have taken the shootings around Carr Bridge are in the habit of giving presents to the herd-boys in the districts in order to engage them to preserve the nests, and if possible guard them from external violence. One of the keepers lately accosted one of these herd-boys, and in answer to several queries on the subject of nests, was told by the boy that in guarding the game from molestation he had no difficulty except with one nest, which was situated in a place much frequented by the cattle, and which he said must have been destroyed unless by some means protected. ‘But,’ continued the boy, ‘I have built a little house of stones and turf about it, and that will prevent the cattle getting at it.’ ‘But,’ said the keeper, ‘you will certainly scare away the birds.’ ‘Oh, no,’ replied the boy, ‘I have left a little door for the hen to get in and out of, and she sits on her eggs as usual ;’ which the keeper on visiting the place found to be true.”

The Black Cock is pursued with great zest in all countries of which it is a native—in Scandinavia various modes of warfare are resorted to.

“A very common plan of starting the Black Cock, in the winter time,” says Mr. Lloyd, speaking of his Scandinavian experiences, “is with the aid of a *bulvan*, or artificial decoy bird. This is affixed to the top of a long and slender pole, or of two poles tied together, which is then hoisted a little above the top of a birch-tree, standing on an eminence, that it may be seen from a distance. The fowler then conceals himself in a screen constructed of a few fir-boughs, previously prepared for the purpose. Here he patiently awaits the coming of the birds, and when attracted by the *bulvan*, or driven towards it by people patrolling the country for the purpose, they alight in the tree on which the decoy is placed, or on those in the immediate vicinity, one or other of them usually meets its doom.

“At times two or three individuals take part in this amusement, and if there be several wooded knolls in the same locality, each may be occupied to advantage by a *jägare* and his *bulvan*, for as these birds, when alarmed at the shot, keep flying from one *bulvan* to the other, they are pretty sure of being killed sooner or later.”

These *bulvans* seem to be very rudely constructed, for if a stuffed Black Cock be not procurable for a *bulvan*, “an imitation one may be made out of an old hat or piece of dark-coloured cloth. Two small patches of red cloth, one on each side of the head, represent the combs over the eyes, and two others of white stuff the white spots on the bird’s shoulders. The tail of a veritable Black Cock is usually attached, but should this not be procurable, one made with black cloth, and lined with white, can be substituted in its stead. Legs are not required, the stick to which the *bulvan* is fastened supplying their place. At times, however, the *bulvan* is carved out of a piece of wood and afterwards painted.” The Black Cock may be domesticated without much trouble, and instances are known of its having bred in captivity. “In the rural districts of Sweden,” Mr. Lloyd tells us, “one often sees a caged Black Cock in the houses of the gentry, this bird being greatly admired by every one both for his beauty and for his *spel*, or song, which, though anything but musical, is wild and pleasing, and during the pairing season almost continual.”

THE HYBRID GROUSE.

The HYBRID GROUSE (*Tetrao medius*). In this remarkable bird, a cross between the Black Cock and Capercali, the entire mantle is black, faintly marked with grey spots and zigzag lines; the upper wing is watered with blackish brown and grey; the secondary quills are enlivened by a brown whitish

stripe, and edged with the same shade ; the slightly-incised tail is black, occasionally with white tips to its feathers. The under side is black, the head and fore part of the neck gleam with a purple light, the sides of the body are powdered with grey and spotted with white ; the plumage of the legs is white, and the tarsus blackish grey ; the eye is dark brown ; and the beak greyish black. The female sometimes resembles that of the Capercali, sometimes the Grey Hen ; but it is smaller than either. The length of the male is from twenty-five to twenty-eight inches ; that of his mate twenty-one to twenty-two inches.



HYBRID GROUSE (*Tetrao medius*).

The Hybrid Grouse are found wherever the Black Cock and Capercali inhabit the same district, and are particularly numerous in Scandinavia. They closely resemble their parents in general habits, although towards the former of these species they frequently exhibit a very pugnacious spirit during the period of incubation, and constantly do great damage to the sportsmen by attacking and disturbing the Grey Hen when brooding.

“The Capercali,” says Mr. Lloyd, “occasionally breed with the Black Grouse, and the produce are in Sweden called *Racklehanen*. These partake of the leading characters of both species, but their size and colour greatly depend upon whether they have been produced between the Capercali

cock and Grey Hen, or *vice versâ*." Females of these hybrids are much more rare than males, but neither, according to Mr. Lloyd are common.

Professor Nilsson has given us the following account of one of these birds which he kept in confinement :—"He is more dull than lively. For the most part he will sit for a whole day on his perch in a passive attitude, with his tail hanging down, his feathers somewhat ruffled, and his eyes closed. He is, nevertheless, wild and shy. Towards people who approach his coop he evinces more shyness than malice ; but to small animals and birds that come near him, or attempt to purloin



HAZEL GROUSE (*Bonasia sylvestris*).

his food, he displays an exceedingly angry and spiteful temper. About March, when he puts on his beautiful summer plumage, he is more vicious than usual. Towards the end of that month, or early in April, when the fine weather sets in, he commences his *spel* (call). In this, however, he never indulges at an early hour in the morning, but only in the daytime, both before and after noon. His moulting season commences about July, and continues for a long period. His food consists of whortle-berries, and other forest berries when obtainable, but he is also fond of apples chopped up small, cabbages, and various vegetables, as well as of barley and the seeds of the spruce pine."

THE HAZEL GROUSE.

The HAZEL GROUSE (*Bonasia sylvestris*), a third species, represents a group that have their tarsi only partially feathered, and their toes quite bare. These birds have the tail composed of sixteen feathers, and rounded at its extremity, while the plumage on the head is prolonged into a crest. The sexes are very similarly coloured, and of about the same size. The plumage on the mantle is spotted reddish grey and white, most of the feathers being also delicately pencilled with undulating black lines. The reddish grey upper wing is enlivened with white streaks and spots; the throat is spotted brown and white. The quills are greyish brown, dotted with reddish white on the narrow outer web, and the blackish tail-feathers dotted with grey, those in the centre being marked with reddish brown. The eye is rust-brown, the beak black, and the bare part of the foot greyish brown.

The length of the male is from seventeen to eighteen inches, and the breadth from twenty-three to twenty-five inches; the wing measures seven and the tail five inches; the female is about one-fifth or one-sixth smaller than her mate. The habitat of this species extends from the Alps to the extreme north of Europe, and from Scandinavia to Eastern Siberia. Extensive forests of oak, beech, alder, and hazel are the situations it prefers, whilst it almost entirely avoids fir and pine woods; for this reason, it is by no means equally spread over this portion of the European continent, being numerous met with in a large part of Scandinavia, Russia, and Siberia, whilst in Austria, Bavaria, Bohemia, and Silesia it is comparatively rare, and in Northern Germany quite unknown. In certain districts the Hazel Grouse remains within its forest home throughout the entire year, and in others wanders to a short distance in search of berries. These expeditions are made by the male birds alone, and they usually return within a month to their former haunts. Leyeu informs us that the retreats chosen by these birds vary with the different seasons of the year—that in May, June, and July they seek the borders of the forest, and in August some retire within the most sheltered nooks of its interior to subsist upon berries, while others wander over the country in the manner above described. In September they again seek the brushwood, and in winter make their home within their favourite forests. In Switzerland they appear to prefer the wooded tracts of the Alps, and are very rarely seen upon the plains that lie beneath. They frequently associate with the Capercali, but often venture higher than that bird. In the more northern parts of Europe, they are also met with in mountainous districts, and in Scandinavia are especially numerous at the foot of the Northern Alps.

The Hazel Grouse is peculiarly quiet and retired in its habits, and has but one mate; its movements upon the ground are rapid, and its power of springing from one point to another when in danger remarkable. Naumann mentions having seen one of these birds leap to a height of fully four feet, in order to snatch some berries from a bush. Whilst running the hen keeps her crest close to her head, whilst that of the male is fully expanded and displayed. Although not much in the habit of having recourse to its wings, the flight of the Hazel Grouse is strong and more rapid than that of the Capercali; in its general character it resembles that of the Partridge.

In Finland, M. Wilhelm von Wright tells us, that the Hazel Hen is found in larger or smaller packs, according to their greater or less abundance in the districts. "It is not for me, of course," says Mr. Lloyd, "to question the accuracy of so good an observer, but singularly enough I myself never heard of more than a single family continuing in company. Sweden, however, is not Finland, and the habits of birds may vary in different countries. The favourite haunts of the Hazel Hen are hilly and wooded districts. In the open country it is never found, but it somewhat varies its ground, according to the season of the year. During summer and autumn one often sees these birds in woods consisting of deciduous trees; but when the leaves begin to fall, they retire to the great pine forests, probably that they may be less exposed to birds of prey.

“Their food in the autumn consists of worms, larvæ, and the various berries with which the Scandinavian forests abound ; but in the winter, when the snow lies deep on the ground, they subsist chiefly on the tender tops of the birch and alder, especially the latter. I have then also found in their crops the stalks and tops of the blackberry.

“Even when the Hazel Hen is ‘treed,’ a practised eye is often required to discover its whereabouts, for it frequently sits so shrouded amongst the branches of an umbrageous pine as not to be readily seen, at least by a casual observer. It is so cunning, moreover, as to regulate its movements by those of the fowler ; for whilst he is on the look-out for the bird on one side of the tree, it creeps to the opposite, leaving during its progress little more than its head exposed, and that only for the purpose of keeping the enemy in sight.

“The usual way of shooting the Hazel Hen in Scandinavia is without any dog, and solely with the aid of the so-called *hjerp-pipa*, or pipe. This implement, which is much less in size than one’s finger, is constructed of wood or metal, or, it may be, the ‘wing-bone of a Black Cock.’ It produces a soft, whistling sound, that may be varied according to the call of the bird. Such a pipe may be readily manufactured. Often, indeed,” continues Mr. Lloyd, “when we have accidentally met with a Hazel Hen has my man with his knife alone made one out of a sapling of a pithy tree, and that in the course of a very few minutes.

“Provided with this implement, the sportsman traverses the forest in silence, and when he has succeeded in flushing the brood he, after a time, begins to *lacka*, when one or other of the birds is pretty sure to respond, or, it may be, fly directly towards him, and in the end he usually succeeds in shooting the whole or greater part of them.”

M. Wilhelm von Wright speaks of the Hazel Hen as an exceedingly amusing bird in an aviary. At first it will not eat, but endeavours to hide itself in a corner ; the best way is therefore to supply it with food and water and leave it to itself. Red whortle-berries and juniper-berries are the best for it at first, but afterwards it will eat hempseed, barley, buckwheat, and other grain. To induce it to drink, some berries should be put into the vessel containing water ; it will also eat meat, raw or boiled. Dry sand should be placed in a box, as it “dusts” itself daily, if provided with this, especially should the sun shine, it makes a hole with its beak in the sand, which it throws over its body. Afterwards it lies first on one side and then on the other, or on its back, with eyes half closed, and often mounts on some part of the coop and whistles.

THE PRAIRIE HEN, OR PINNATED GROUSE.

The PRAIRIE HEN, or PINNATED GROUSE (*Tetrao cupido*, or *Cupidonia Americana*), a North American species very nearly related to the above birds, represents a group recognisable by two long tufts, each composed of about eighteen slender feathers, that hang down on each side of the neck and cover bare patches of skin which indicate the position of bladder-like cavities connected with the windpipe and capable of being inflated. The sexes are similarly coloured, but are readily distinguished by the inferior size of the tufts on the head of the female. The feathers on the mantle are black, striped with pale red and white, while those on the under side are striped light brown and white. The quills are greyish brown, with black shafts, and spotted with red on the outer web ; the tail-feathers dark greyish brown, tipped with dirty white ; the regions of the cheeks and throat are yellowish ; the belly is of a whitish shade, and a line under the eye brown ; the long throat-feathers that form the tufts are dark brown on the outer and pale yellowish red on the inner web. The eye is reddish brown, the brow bright scarlet, beak dark horn-grey, and bare parts of the foot and throat orange-yellow. This species is eighteen inches long, and its breadth thirty inches ; the wing measures five inches and five-sixths, and the tail four inches and a half.

“When I first removed to Kentucky,” says Audubon, “the Pinnated Grouse were so abundant that they were held in no higher estimation as food than the most common flesh, and no hunter of Kentucky deigned to shoot them. They were, in fact, looked upon with more abhorrence than the Crows are at present in Massachusetts and Maine, on account of the mischief they committed among the fruit-trees of the orchards during winter when they fed on their buds, whilst in the spring months they picked up the grain in the fields. Children were employed to drive them away with rattles from morning till night, and also caught them in pens and traps of various kinds. In those days during the winter, the Grouse would enter the farm-yard and feed with the poultry, alight



THE PRAIRIE HEN (*Cupidonia Americana*).

on the houses, or walk in the very streets of the villages. I recollect having caught several in a stable at Henderson, where they followed some Wild Turkeys. In the course of the same winter a friend of mine, who was fond of rifle-shooting, killed upwards of forty in one morning, but picked none of them up; so satiated with Grouse was he as well as every member of his family. My own servants preferred the fattest flitch of bacon to their flesh, and not unfrequently laid them aside as unfit for cooking.”

Such an account appears still more strange when we learn that in the same country where sixty years ago they could not have been sold for more than a cent a-piece, scarcely one is now to be found. The Grouse have abandoned the State of Kentucky, and removed (like the Indians) every season further westward to escape from the murderous white man. In the Eastern States where some of them still exist, game-laws have been made for their protection. The Pinnated Grouse selects for its abode wide prairies and treeless land covered only with grass or scattered bushes, and has hence received the name of the Prairie Hen; it does not, however, avoid cultivated land,

but readily avails itself of the plentiful supplies of food to be found there. This species is more strictly confined to the ground than any other of its kindred, and seldom ascends the trees or bushes except in search of fruits or berries, or when pressed by severe weather. In winter these birds go on expeditions which have been called migrations, but though these occur with some regularity, their only object is to seek for favourable feeding-places. Even these short journeyings are not always undertaken, but take place in certain winters, so that many sportsmen are under the impression that these birds are non-migratory. This species is less elegant than the Ruffled Grouse, its walk resembling that of the Common Hen, although it carries its head more erect. If surprised it rises at once; but if it perceives the sportsmen from a distance and the spot around it clear, it runs off swiftly to the next high grass, there to conceal itself till danger is past. Audubon describes these birds as running rapidly with wings partially expanded, until suddenly meeting with a large clod they stop, squat, and disappear in a moment. At noon they may be seen near to each other dusting themselves and trimming their feathers. When the mother of a brood is discovered with her young, she ruffles up her feathers and tries every art to allure you from the place. On the larger branches of trees these birds walk with ease; but on smaller ones balance themselves with their wings. They usually roost singly on little risings of the ground, and a few feet apart. Their flight is strong, regular, tolerably rapid, and at times prolonged to several miles distance.

“The Pinnated Grouse,” says Audubon, “moves through the air with frequent beats, after which it sails with the wings bent downwards, balancing itself for a hundred yards or more, as if to watch the movements of its pursuer, for at this time they can be easily observed to look behind them as they proceed. They never rise when disturbed without uttering four or five distinct clucks, although at other times they fly off in silence. The ordinary voice of this species nearly resembles that of our domestic fowls, but during the pairing season the male utters a peculiar call.

“The curious notes,” continues the same writer, “emitted in the love season are peculiar to the male. When the receptacles of air above alluded to, which in form, colour, and size resemble a small orange, are perfectly inflated, the bird lowers its head to the ground, opens its bill, and sends forth, as it were, the air contained in these bladders in distinctly-separated notes, rolling one after another, from loud to low, and producing a sound like that of a large, muffled drum. This done, the bird immediately erects itself, refills its receptacles by inhalation, and again proceeds with its ‘tootings.’” Audubon observed in those Prairie Hens he tamed, that after producing the noise the bags lost their rotundity and assumed the appearance of a burst bladder, but in a few seconds became again inflated. He caught one of these birds and pierced the air-cells with the point of a pin, after which it was unable to “toot” any more. Another bird, of which he punctured one cell only, was unable to inflate that one, but next morning could toot with the other, though not so loudly as before. As soon as the pairing and fighting season is over, the bladders collapse and are concealed beneath the feathers of the ruff. During the winter they are much reduced in size. The bladders and long neck-feathers are seen on the young males before the first winter, and in the spring attain maturity, but they increase in size and beauty for several years.

These birds live both on vegetable food and on insects. During the sowing season they visit corn-fields of various kinds, where they do considerable damage. They feed on the barberry, and various other berries growing on low shrubs, on buds of various plants, and on acorns. “In the western country,” says Audubon, “these birds frequent the sumach bushes to feed on their seeds, often in such numbers that I have seen them bent by their weight, and I have counted more than fifty on a single apple-tree, the buds of which they entirely destroyed in a few hours. They also alight on high forest trees on the margins of large rivers. During winter these Grouse congregate in large flocks, but as soon as the snows have melted away, and the first blades of grass

issue from the earth, announcing the approach of spring, they separate into parties of fifty or more, their love season commences, and a spot is pitched upon to which they daily resort until incubation is established. Inspired by love, the male birds, before the first glimpse of day lightens the horizon, fly swiftly and singly from their grassy beds to meet, to challenge, and to fight the various rivals led by the same impulse to the arena. The male is at this season arrayed in his full dress, and enacts his part in a manner not surpassed in pomposity by any other bird. Imagine them assembled to the number of twenty by daybreak; see them all strutting in presence of each other; mark their consequential gestures, their looks of disdain, and their angry pride as they pass each other. Their tails are spread out and inclined forwards to meet the expanded feathers of their neck, which now, like stuffed frills, lie supported by the globular, orange-coloured receptacles of air from which their singular booming sounds proceed. Their wings, like those of the Turkey Cock, are stiffened, and declined so as to rub and rustle on the ground as the bird passes rapidly along. Their bodies are depressed towards the ground, the fire of their eyes evinces the pugnacious workings of their minds, their notes fill the air around, and at the very first answer from some coy female the heated blood of the feathered warriors swells every vein, and presently the battle rages. Like Game Cocks, they strike and rise in the air to meet their assailants with greater advantage. Now many close in the encounter; feathers are seen whirling in the agitated air, or falling around them tinged with blood. The weaker begin to give way, and one after another seek refuge in the neighbouring bushes. The remaining few, greatly exhausted, maintain their ground, and withdraw slowly and proudly, as if each claimed the honours of victory. The vanquished and the victors then search for the females, who, believing each to have returned from the field in triumph, receive them with joy. It not unfrequently happens that a male already mated is suddenly attacked by some disappointed rival, who unexpectedly pounces upon him after a flight of considerable length, having been attracted by the cackling of the happy couple. The female invariably squats next to and almost under the breast of her lord, while he, always ready for action, throws himself on his daring antagonist, and chases him away never to return."

In tracts of land in the western country, the Pinnated Grouse may be heard booming and tooting before break of day, and at all hours afterwards until sunset; but in those districts where they have been frequently annoyed by that intruder, man, their meetings are more noiseless, their battles shorter and less frequent, and their fighting-grounds more concealed. Many of the young males fight in the autumn, the females generally joining them to make peace.

The nest is made earlier or later, according to the latitude of the place, between the beginning of April and the end of May. Audubon found a nest in Kentucky finished and containing a few eggs at the first-mentioned date; but he thinks, taking the difference of seasons into consideration, that the average time is about the beginning of May. The nest, which is formed of dry leaves and grass, neatly interwoven, is carefully placed amid the tall grass, or a large tuft in the open ground, or at the foot of a bush. The eggs are from eight to twelve in number, and are of a light colour. The mother sits upon the nest eighteen or nineteen days, and as soon as the young have freed themselves, leads them away from the nest, when the male ceases to associate with her. In autumn the families congregate together in flocks, which at the approach of winter consist of several hundreds. When alarmed, the young squat so closely in the grass as to be quite hidden. "Once," says Audubon, "my horse almost placed his foot on a covey that was in the path. I observed them, and instantly leaped to the ground; but, notwithstanding all my endeavours, the cunning mother saved them by a single cluck. The little fellows rose on the wing for only a few yards. I spent much time in search of them; I could not discover one. I was greatly amused, however, by the arts the mother employed to induce me to leave the spot where they lay concealed."

These birds never have more than one brood during the year ; but should the eggs have been destroyed, a second set is laid, generally fewer in number than the first. About the 1st of August the young are nearly as large as the little American Partridge, and are then fit for the table ; but they do not become strong in the wing till the middle of October.

The war against these Grouse is carried on in various ways. Some are shot on their breeding-places, others killed with sticks, or caught in nets and snares. "I observed," says Audubon, "that for several nights in succession many of these Grouse slept in a meadow not far distant from my house. This piece of ground was thickly covered with tall grass, and one dark night I thought of amusing myself by trying to catch them. I had a large seine, and took with me several negroes supplied with lanterns and long poles, with the latter of which they bore the net completely off the ground. We entered the meadow in the early part of the night, although it was so dark that without a light, one could hardly have seen an object a yard distant, and spreading out the leaded end of the net, carried the other end forward by means of the poles, at the height of a few feet. I had marked before dark a place in which a great number of the birds had alighted, and now ordered my men to proceed towards it. As the net passed over the first Grouse in the way, the alarmed bird flew directly towards the confining part of the angle, and almost at the same moment a great number of others arose, and, with much noise, followed the same direction. At a signal, the poles were laid flat on the ground, and we secured the prisoners, bagging some dozens. Repeating our experiment three times in succession, we met with equal success ; but now we gave up the sport on account of the loud bursts of laughter from the negroes, who could no longer refrain. Leaving the net on the ground, we returned to the house laden with spoil, although I am confident that several hundreds had escaped."

"The Pinnated Grouse," as Audubon further relates, "is easily tamed, and easily kept. It also breeds in confinement. I have often been surprised," he continues, "that it has not been fairly domesticated. While at Henderson I purchased sixty alive that were expressly caught for me within twelve miles of that village, and brought in a bag laid across the back of a horse. I cut the tips of their wings, and turned them loose in a garden and orchard about four acres in extent. Within a week they became tame enough to allow me to approach them without their being frightened. I supplied them with abundance of corn, and they fed besides on vegetables of various kinds. This was in the month of September, and almost all of them were young birds. In the course of the winter they became so gentle as to feed from the hand of my wife, and walked about the garden like so many tame fowls, mingling occasionally with the domestic poultry. I observed that at night each individual made choice of one of the heaps in which a cabbage had grown, and that they invariably turned their breast to the wind, whatever way it happened to blow. When spring returned they strutted, 'tooted,' and fought, as if in the wilds where they had received their birth. Many laid eggs, and a good number of young ones made their appearance ; but the Grouse at last proved so destructive to the young vegetables—tearing them up by the roots—that I ordered them to be killed. So brave were some of the male birds that they never flinched in the presence of a Turkey Cock ; and now and then would stand against a Dunghill Cock for a pass or two before they would run from him."

The PTARMIGANS (*Lagopus*) constitute a group of remarkable birds, characterised by their very compact body, medium-sized wings, in which the third quill is the longest, a short, slightly rounded, or straight tail, composed of eighteen feathers, and a small beak. The comparatively small feet have the tarsi and toes covered with hairy feathers. The rich plumage varies in its hues ; according to the season of the year ; the sexes are very similar in their coloration, and the young soon

acquire the same tints as their parents. The unusually large claws possessed by the members of this group are shed, like those of their congeners, when the plumage is changed. The Ptarmigans inhabit both America and the Eastern Hemisphere as far northward as vegetation extends, and have occasionally been seen even at 80° north latitude. In a southerly direction they are met with as far as the Alps, the Pyrenees, and the mountains of Central Europe.

These birds live on open ground, and feed upon twigs and leaves of shrubs, berries, grasses, and seeds; their flight is quick, strong, and prolonged. They walk and run very nimbly, and often escape from their pursuers by hiding under shrubs or among heather, when much alarmed they take wing, but even then never resort to the woods for shelter. Their eggs, which are numerous, are spotted with dark brown. The young run about as soon as they leave the egg, and follow their mother in search of food. At the approach of winter several families frequently associate together.

THE WILLOW PTARMIGAN.

The WILLOW PTARMIGAN (*Lagopus albus*) is about fifteen inches long and twenty-four inches and a half broad; its wing measures seven inches and a half, and the tail four inches and a quarter, the female is one inch shorter and narrower than her mate. During the winter the plumage of this beautiful bird is of a dazzling white, except the fourteen outer tail-feathers, which are black, with white roots and edges; the six largest quills have an oval brownish black streak in the outer web. As the pairing season advances, the head and nape become reddish brown, spotted and streaked with black, the feathers on the shoulders, back, and rump, and those in the centre of the tail are black, edged with white, and have lines of reddish brown or yellow over half their surface; the tail-feathers become paler and lose their light edges. The primary quills remain white as in winter, while the secondaries turn brown; the face and throat are usually of unspotted reddish brown; the head, upper breast, and thighs of a reddish hue, dotted and lined with black; the feathers of the middle part of the breast are black, spotted with reddish brown and white, and those of the belly and legs entirely white. The lower tail-covers are black, marked with reddish brown and yellow, and the corners of the mouth are decorated with white spots. The above colours often vary in their shades, and in the course of the summer become much paler. The female is always lighter in hue than her mate, and acquires her summer plumage before the male. When the feathers begin to darken, the comb on the brow becomes higher and of a reddish tint.

Many observers have assumed that there are two moulting seasons—the first, which occurs in autumn, extends to the whole of the feathers; during the second, which takes place in spring, the smaller feathers alone are changed; but the winter clothing does not immediately replace the summer dress, nor does that at once supersede the winter suit. On this account it has been supposed by some that the Ptarmigan moults four times in the year. American observers, on the contrary, think they have perceived that the smaller feathers at least are not replaced, but simply changed in colour. According to Richardson, “The second change is occasioned, not by the reproduction of feathers, but by the coloured ones becoming white, the process commencing on their tip. This alteration takes place in scattered feathers, which at the same time lengthen, and in a week or ten days the change is complete; spotted specimens undergoing the change may be distinguished from spring ones by the worn state of the tarsal feathers.”

This Ptarmigan is spread throughout the northern parts of both the New and Old World, although it is not found everywhere in the same numbers. It is very plentiful in Scandinavia, and also in Finland, and Russia, and common in the eastern coasts of the latter country, and in many parts of Siberia. Radde did not meet with it about the Lake of Baikal or the Amur, and therefore concludes that it does not stay there during the summer; but he found it in Eastern Sayan, at a height of

between five and six thousand feet above the sea-level, on wide plains, overgrown with birch bushes. It breeds in the valleys of the Rocky Mountains, and upon the arctic coasts; but collecting in flocks on the approach of winter, it retires southward as the severity of the weather increases. Considerable bodies, however, remain behind, even in the coldest winters. In the year 1819 its earliest appearance at Cumberland House, latitude fifty-four degrees, was in the second week in November, and it returned to the northward again before the beginning of spring.

These Ptarmigans prefer the shelter of birch or willow trees, and where such abound are



THE WILLOW PTARMIGAN (*Lagopus albus*). ONE-THIRD NATURAL SIZE.

frequently met with in very large numbers, one pair living close to another, but each holding its own small domain (usually measuring about fifteen paces) with the utmost intrepidity against all intruders; no sooner, however, is the breeding season over than the various families unite into large flocks, and wander over the country to a considerable distance. In disposition this species is lively, and its movements generally restless and rapid, its broad, thickly-feathered feet enabling it to run with equal facility over fresh snow or unsafe moss-covered earth. Whilst in motion the head and tail are usually held down; but when the bird is quite secure from danger, the body is kept much elongated, and the head boldly raised erect. The flight is graceful and light, that of the male accompanied by a loud resonant note as he is about to descend, but the female utters no sound when on the wing. During

very severe seasons, or when an enemy is at hand, the Willow Ptarmigan frequently takes refuge in the snow for warmth or shelter; and in very sharp wind, or biting frost, it is not uncommon to see a whole flock snugly buried in a snow-bed, close to each other, with only their heads protruding, to enable them to detect the first sign of danger, in evading which they exhibit a most wonderful instinct. Their food consists of leaves, buds, blossoms, berries, and various kinds of insects; grain of all kinds they also devour. The nest of this species is concealed with great skill in some retired nook, and slightly lined with grass, earth, and feathers. The small pear-shaped eggs are laid at the end of May or beginning of June; they are from twelve to sixteen in number, and have a yellowish shell, thickly covered with reddish-brown dots and streaks. No sooner are the young capable of walking than they are at once led forth to seek their food upon the neighbouring marshes and bogs, as the insects and larvæ of which such localities afford a rich supply are particularly acceptable to the delicate little family. Throughout the whole of the breeding season, many and fierce encounters take place between the male birds, and from ten o'clock in the evening till early morning their loud calls may be heard challenging each other to a trial of strength, which usually continues until the females gently warn their pugnacious partners that it is time to retire to rest.

THE ALPINE OR GREY PTARMIGAN.

The ALPINE OR GREY PTARMIGAN (*Lagopus Alpinus* or *mutus*)—see Coloured Plate XXVIII.—may be said to vary its plumage every month during the summer. At all seasons, however, the belly, lower tail-covers, exterior wing-covers, quills, and tarsi are white, the tail is black, and the quills streaked with black. About the middle of April other black feathers begin to make their appearance, and the entire plumage becomes, as it were, chequered. By May the head, throat, back, and upper feathers of the wing-covers are more or less variegated with reddish brown and white. As the autumn approaches the feathers gradually change, and by the end of September are of a light grey, dotted with black, and the reddish streaks on the neck and head almost white. In the female these parts are marked with undulating reddish and black lines, the bands being much broader and more clearly defined. In winter the plumage of the male is entirely of a snowy white, except the few black tail-feathers; these latter also show a light border. Occasionally specimens are met with that have retained some of these dark feathers through the cold season.

The Alpine Ptarmigan, or Fjall Ripa, as it is called, is met with in Scotland, and abounds in Scandinavia, in the higher ranges of that peninsula, up to the vicinity of the North Cape.

“The Fjall Ripa,” says Professor Rusch, in a letter to Mr. Lloyd, “is found so far south in the province of Christiansand, that its southern limits can certainly be placed in latitude 58° 40′. It occurs wherever the mountains rise above the limits of the dwarf birch, with steep precipices and stone rubble. On mountains in the southern districts of Norway, at the height of 3,000 to 3,500 feet, the sportsman may be tolerably certain of meeting with one pair or more of these birds.”

During the year the plumage varies very considerably, being almost in a constant state of moult. By all accounts, this species puts on at least three different dresses in the course of the year. The tail-feathers are always black, and the male has a small black mark from the base of the bill to the temple; but with these exceptions the winter dress of both sexes is white.

The male begins to assume his spring dress about the middle of April, the female a few days later, and usually completes it by the end of May or beginning of June; the information respecting the autumnal moulting is not so precise. In the beginning of September, according to Barth, they have assumed the greater part of their autumnal dress, which about the middle of the same month begins to change into the winter plumage in such a manner that the autumn moulting is simultaneously continued.

The *Lagopus Alpinus* is not shy in summer, and early in autumn may be approached very closely without taking flight. "Not unfrequently, indeed," says Mr. Lloyd, "the fowler or wayfarer finds himself in the very midst of a brood, without having been previously aware of its presence; but as the season advances the several families 'pack,' and they then become very wary, especially should they have become associated with the *Lagopus albus*, which is of a much wilder nature, and thus they keep together throughout the winter, and until the month of May, when they separate in pairs. Their favourite resorts are amongst stones and shingle, where they find shelter in bad weather, and from which in their summer plumage they are hardly to be distinguished."

During the summer and autumn they feed on seeds and leaves, especially on those of the craneberry (*Empetrum nigrum*), the leaves of which are green all the year round. When heavy storms of snow make these unattainable they devour the tender tops of willow and dwarf birch.

"The easily satisfied appetite of the *Lagopus Alpinus*," says M. Barth, "coupled with the fact that the craneberry grows in such profusion everywhere as in many places to cover the whole slope of the *fjall*, up to near the line of perpetual snow, explains the question why these birds never lack food in the higher regions, where one would least suppose it possible for any living creature to find the wherewithal to sustain existence. The craneberry plant in some years has so many berries that the ground looks black with them; nevertheless, in those years I never found the berries themselves in the crop of this species, but only the stalks and leaves. After producing fruits in such abundance, the craneberry plant would seem to require some time for rest, inasmuch as in the succeeding year scarcely a berry is to be seen on it. The Ptarmigan would therefore be very badly off if its taste only permitted it to feed on the berry and not on the stalk—another instance of the wise foresight of Nature. During pairing time the cry of the male is said to resemble the croak of a frog, or the snoring of a man. The female note is a low 'ü-ack, ü-ack.'"

The nest is made among stones, or heather and grass. The eggs are yellowish, with brown spots, and are from eight to fourteen in number. The brood is hatched about the middle or end of June, according to the season. The male is said to remain with his mate during the time of incubation, but as soon as the young are hatched he leaves them with their mother and joins his male companions on the upper part of the *fjalls*, where his family follow him with their mother as soon as they are sufficiently grown; both parents and brood remain together till the approach of winter, when the various families unite in packs. Mr. Lloyd, however, doubts the truth of the generally-believed fact of the partial separation of the male from his family, and thinks that these packs of males may be such as have been unable to obtain mates.

"While the female is sitting," says M. Grouland, "the male always remains in the near vicinity of the nest, to protect her against the attacks of foxes, weasels, and the numerous birds of prey by which she is then often molested. He never separates from her, even after the young are hatched, but accompanies the family everywhere, and evinces the same regard for the mother as for the poults. When meeting a family of Fjall Ripa (the Swedish name for these birds) in the forest, one has an opportunity of witnessing the instinct implanted by Nature in the parents to protect their offspring. Should a person then approach the spot where they are collected, the male, for the purpose of drawing the enemy's attention from them to himself, runs forward to meet him with plaintive cries and outstretched wings, thereby endangering himself to secure the safety of those he holds dearer than life itself."

M. Barth relates that, "When the fowler comes suddenly upon a brood of young Fjall Ripa it is really distressing to see the mother running to and fro before him. Should he remain stationary, her boldness gradually increases, until at length, either from a feeling of her own weakness, or from her fears being dispelled at seeing him make no attempts to injure her, she by degrees retires with the

same pitiable mien, and ultimately hides herself behind a bush, waiting for the moment when she may once more venture to call her chicks together. Ofttimes has a female Fjall Ripa approached so near me in the way I have described that I could have killed her with my foot."

The *Lagopus Alpinus* is pursued by many feathered enemies, and when hard pressed sometimes takes refuge in the hut of the Laplander or among his reindeer. "Of all the genus *Tetrao*," says Mr. Lloyd, "this species is the least in request in Scandinavia, but if well dressed I have always found it very palatable, and little inferior to the *Lagopus albus*."

THE RED GROUSE, BROWN PTARMIGAN, OR GAR COCK.

The RED GROUSE, BROWN PTARMIGAN, OR GAR COCK (*Lagopus Scoticus*), closely resembles the



THE ALPINE PTARMIGAN (*Lagopus Alpinus*), IN SUMMER PLUMAGE. ONE-THIRD NATURAL SIZE.

above bird in its general appearance during the summer, but is without the white feathers in the wings, and has the feet covered with plumage of a greyish hue, spotted with brown. The feathers on the head and nape are light reddish brown, spotted with black; those on the back and wing-covers are spotted in the centre with black; the throat-feathers are red, those on the back and belly dark purplish brown, with numerous markings; the quills are dark brown, and the quill-feathers, except the four in its centre (which are striped red and black) are entirely black; the plumage on the legs has a reddish shade and dark markings; the tarsi and toes are covered with whitish feathers. The eye is nut-brown, the beak black, and the powerful claws of a whitish hue. The female is darker than her mate, has white spots on her breast and belly, and some of her wing-feathers tipped with white. This species is fifteen inches long and twenty-six broad; the female is not quite so long.

The Red Grouse is peculiar to Great Britain and Ireland, not having been found in any other part of the world, and is especially abundant in Scotland, inhabiting heathy tracts from the

sea-level to a height of 2,000 feet, particularly in the moist peat tracts of the western and northern districts.

“It is pleasant,” says Macgillivray, “to hear the bold challenge of the Gar Cock at early dawn on the wild moor, remote from human habitation. I remember with delight the cheering influence of its cry on a cold morning in September, when, wet to the knees and with a sprained ankle, I had passed the night in a peat-bog in the midst of the Grampians, between the sources of the Tummel and the Dee.” After expatiating on his misadventures and the reflections to which they gave rise, he continues, “However, morning came at last, and I started up to renew my journey. It was now that



THE ALPINE PTARMIGAN (*Lagopus Alpinus*), IN WINTER PLUMAGE. ONE-HALF NATURAL SIZE.

I got a view of my lodging, which was an amphitheatre formed of bare craggy hills, covered with fragments of stone and white moss, and separated by patches of peat-bog. Not a house was to be seen, nor a sheep, or so much as a blade of green grass. Not a vestige of life can be found here, thought I; but I was reprov'd by a cry which startled me. The scarlet crest and bright eye of a Moor Cock were suddenly protruded from a tuft of heather, and I heard with delight the well-known ‘kok, kok’ of the ‘blessed bird,’ as the Highlanders call him.”

“The Brown Ptarmigan,” continues our author, “feeds for the most part upon the tops of heath (*Calluna vulgaris* and *Erica cinerea*), and also picks the leaves and tender twigs of *Vaccinium myrtillus* and *Empetrum nigrum*, with the young heads of *Eriophorum vaginatum*, shoots of *Galium saxatile*, *Carices*, grasses, willows, and other plants. It is also said to eat the berries of *Empetrum nigrum*,

Vaccinium myrtillus, and *Vaccinium vitisidæa*. In two instances I have found its crop filled with oat-seeds, to which it is said to be very partial, although it rarely ventures upon cultivated land. While feeding, it walks among the heath, selecting the fresh tips of the twigs, which it breaks off nearly of the same size, the largest pieces not exceeding half an inch in length. Along with these substances, fragments of white quartz, from one-twelfth to two-twelfths of an inch in diameter, are found in the crop and gizzard, being introduced for the purpose of aiding the action of the latter in comminuting the food. When the Brown Ptarmigans have filled their crops they repose among the heath or bask under a sunny bank, under the shelter of the shrubs or tufts of herbage. On ordinary occasions this species does not fly much, but keeps concealed among the heath, seldom choosing to rise, unless its enemy comes very near. On the approach of danger it lies close to the ground, when, being of a colour not contrasting strongly with that of the plants around, it is with difficulty perceived by rapacious birds." When traced by a dog, it either runs to some distance or squats at once, and often remains thus concealed for a long time, or again runs and squats. "I have seen them," continues Macgillivray, "run in this manner for four or five hundred yards before they were put up. On such occasions the male is generally the first to rise. He erects himself among the heath, stretches out his neck, utters a loud cackle, and flies off, followed by the female and young, affording by their straightforward, heavy, though strong flight an easy mark to a good shot."

The Red Grouse flies low, heavily, and in a direct course, moving its wings rapidly, sometimes, especially when at full speed, with a whirring sound, and then descending with almost motionless pinions.

"If disturbed when feeding," says Macgillivray, "the male often boldly starts up and utters a loud cackle, which may be imitated by quickly repeating the syllable 'kok' with a deep voice. In spring and summer they are often heard uttering the same sound without being disturbed, either as a call of defiance to their fellows, or as a warning or protection to their mates and young. Early in the morning as well as late in the evening, but occasionally through the day, you may hear on the moors a loud cry, which is easily syllabled into 'Go, go, go, go, go-back, go-back;' although the Celts, naturally imagining the Moor Cock to speak Gaelic, interpret it as signifying, 'Co, co, co, co, mo-claidh, mo-claidh'—that is, 'Who, who (goes there?) my sword! my sword!'" These birds pair early in spring. The nest is made in a hollow of the ground among the heath, and is irregularly formed of bits of twigs, grass, and a few feathers; the eggs, from eight to twelve in number, are oval, and of a yellowish white, yellowish grey, or brownish yellow colour, clouded, blotched, and dotted with blackish and amber brown. The young leave the nest soon after they are hatched, and are tended by both parents, the mother showing much anxiety for her progeny, and endeavouring by affecting lameness to lure any intruder from them. The young are soon able to fly, and all keep together till the end of autumn, when several flocks unite and form a pack, continuing together till spring arrives, when they separate and pair. In the more remote parts of Scotland the Red Grouse is considered a bird of good omen. By its crowing at dawn, the evil spirits of night are thought to be put to flight, or deprived of their power. The flesh of the Red Grouse is dark, and has a peculiar, bitter flavour, but is held in high estimation.

The PARTRIDGES (*Perdices*), one of the most numerous groups of the order, are comparatively slenderly built birds, with small heads and unfeathered tarsi. The wings, in which the third or fourth quill exceeds the rest in length, are relatively quite as short and rounded, but not so much arched as those of the *Tetraones*. The tail, composed of from twelve to sixteen feathers, is always short. The somewhat elongated beak is but slightly raised at its culmen, and compressed at its sides. The tarsus is frequently furnished with one, or occasionally with two spurs. The members of this

group are without the warty skin above the eyes possessed by the birds above described ; in some species, however, bare patches are observable on those parts, and on the throat. The plumage is smooth, and very similarly coloured in both sexes. These birds inhabit all portions of the eastern hemisphere, except its extreme north, and frequent every variety of locality from the coast to a very considerable height on mountain ranges. Some species prefer cultivated lands, while others are found in forests where they may occasionally be seen perched on the branches of trees. Their food consists of insects, grain, and portions of plants. The nest is a mere hole scratched in the dry mould, generally under the shelter of some bush or tuft of grass. The eggs, from twelve to twenty in number, are hatched in three weeks time ; the female sits exceedingly close on her nest during this period, especially during the latter part of incubation, and offers a bold resistance to any enemy seeking to plunder her ; but if quietly approached, both she and her eggs may be gently removed, and she will hatch them in confinement, departing with her young to the fields as soon as the latter are able to accompany her. The male takes no part in the labour of incubation, but like all birds that pair, he is attentive to his mate, assists her in defending the brood, and uses many arts to lure intruders from the nest. The young are reared on small insects, larvæ, and the eggs of insects ; the parents leading them to the places where these are deposited, and scraping away the mould. Multitudes of ants and larvæ are eaten by young Partridges.

The SNOW PARTRIDGES (*Tetraogallus*) may be regarded as combining the characteristics of both the Ptarmigans and Partridges. Their body is compactly framed, their neck short, the head small, the wing of moderate size, and slightly pointed at the extremity, its second and third quills being longer than the rest. The gently-rounded tail is of medium length ; the beak long, broad, and powerful, and the heavy short foot furnished with a blunt spur. The thick plumage is much developed on the tail-covers ; a small patch behind the eye is unfeathered.

THE CASPIAN SNOW PARTRIDGE.

The CASPIAN SNOW PARTRIDGE (*Tetraogallus Caspius*), a member of the above group, inhabiting Persia, is dark grey upon the head, nape, and upper breast ; the plumage on the back is varied grey and reddish yellow, and the rest of the under side grey, the shafts of the feathers are streaked longitudinally with reddish yellow. Two dark lines pass from the corners of the lower mandible to the breast. These lines divide three white patches, one on the throat, and one on each side of the face. The feathers on the upper wing-covers are shaded with black and reddish yellow, with a broad red edge at their outer web ; the quills are pure white, as are the belly and feathers of the lower tail-covers. The eye is dark brown, the beak pale horn-grey, and the foot reddish yellow. The length is about twenty-four inches.

This species was first described by Gmelin, in 1788-93, in the thirteenth edition of the "Systema Naturæ." Latham, who places it among the true Partridges, says that it inhabits Astrabad, Ghilan, and other parts of Persia.

We are indebted to Mr. Gray, who has made for these birds the separate generic title of *Tetraogallus*, for the following description of their habits, derived from the *St. Petersburg Transactions* :—" This species builds on the highest summits of the rocky mountains of the Caucasus. It prefers altogether the region of snow, which it never quits. Thus, when we desired to acclimatise the young chickens of this Partridge in the plains of Kahetia, they have not survived the spring. It runs on the rocks and the ledges of precipices with great agility, and rises with a great cry at the least danger ; so that the most skilful sportsman cannot approach within shot except under cover of mists. It lives in societies of from six to ten, becoming the inseparable companion to the goat, on the excrement of which

it feeds during the winter months. In autumn it grows very fat, and its flesh resembles that of the Common Partridge. In the crop of this gallinaceous bird I have found a quantity of sand and small stones, mixed with all kinds of seeds of Alpine plants."

The following passage in Layard's "Discoveries in the Ruins of Nineveh and Babylon" seems also to refer to this species:—"A covey of large birds sailed with a rapid swoop, with the whistling sound peculiar to the Partridge kind, from an opposite height, and alighted within a few yards of me. They were the *Kabk-i-dered*, or the *Pur-kak-lik*, as they are called by the Turks, a gigantic Partridge, almost the size of a small Turkey, only found in the highest regions of Armenia and Kurdistan."

Prince Charles Bonaparte thought that there was some reason for believing that this species exists on the confines of Europe, and a correspondent of Mr. Gould's observed it among the mountains of Candia, where it was excessively rare, and only to be seen on the peaks of the hills.

In the Zoological Gardens, London, two specimens were received, one in 1842, and another about 1852, both of which lived there for several years.

THE HIMALAYAN SNOW COCK, OR SNOW PHEASANT.

The HIMALAYAN SNOW COCK, OR SNOW PHEASANT (*Tetraogallus Himalayensis*), is grey upon the top of the head, cheeks, and nape. The feathers on the back are of a reddish grey, delicately spotted with black, and streaked with deep reddish brown. The chin, nape, throat, and lower breast are whitish. The upper breast is greyish white, decorated with crescent-shaped black spots. The rest of the feathers are grey, sprinkled with brown, and marked with two brown spots. The sides are paler than the mantle, and the lower covers almost white; the tarsi are dark grey. The eye is surrounded by two brown lines, which unite at the sides of the neck. The primary quills are white, their grey tips spotted with brown. The tail-feathers are of a reddish shade, spotted with black on the outer and grey on the inner web. The eye is deep brown, the bare patch behind it yellow, the beak pale horn-grey, and the foot yellowish red. The male is twenty-nine inches long, and forty broad; the wing measures thirteen, and the tail eight inches. The female does not exceed twenty-four inches in length.

"These fine birds," we learn from Hutton, "are common in the Hazara Mountains, and are called by the Affghans *Kank-i-durra*, or the Partridge of the Ghâts. They are sometimes sold in the markets of Cabool and Candahar. They rise," he tells us, "in coveys of from ten to twenty, and usually have a sentry perched on some neighbouring rock, to give warning of danger by a low and musical whistle."

The *Tetraogallus Himalayensis* "is confined," says "Mountaineer," "exclusively to the snowy mountain ranges, or the large spurs jutting from them which are elevated above the limits of forest, but is driven in winter to perform one, and in some places two, annual migrations to the middle regions. In summer it is only seen near the limits of vegetation. In Kunawur it is common at all seasons, from Cheenee upwards; but on the Gangetic hills, from June till August, however much a person wanders about on the highest accessible places, but few are met with, and I have no doubt whatever but that nearly all such as at other seasons frequent this part retire across the snow into Chinese Tartary to breed. About the beginning of September these birds are first seen near the tops of the higher grassy ridges jutting from the snow, and the green slopes above and about the limits of forests. After the first general and severe fall of snow they come down in numbers on to some of the bare exposed hills in the forest regions, and remain there till the end of March. This partial migration is probably made in the night after the fall of snow, as I have invariably found them in their winter quarters early next morning. It requires a deep fall of snow to drive them down, and in some mild winters, except a few odd birds, they do not come at all. The birds on each respective hill seem to have a particular spot for their winter resort, which they return to every year the migration is made. The Snow Pheasant is gregarious, congregating in packs, sometimes to the number of twenty or thirty, but in general not

more than from five to ten, several packs inhabiting the same hill. In summer the few which remain on our side are found in single pairs generally; but across the snow, where the great body migrate, I almost always, even then, found several together. They seldom leave the hill on which they are located, but fly backwards and forwards when disturbed.

“The *Jer-moonals*, as these birds are called in India, never enter forest or jungle, and avoid spots where the grass is long, or where there is underwood of any kind. It is needless to add that they never perch. During the day, if the weather be fine and warm, they sit on the rocks, or rugged part of the hills, without moving much about, except in the morning and evening. When it is cold and cloudy, and in rainy weather, they are very brisk, and are moving about and feeding all day long. When feeding they walk slowly uphill, picking up the tender blades of grass and young shoots of plants, occasionally stopping to snatch up a certain bulbous root of which they seem very fond. If they reach the summit of the hill, after remaining stationary for some time, they fly off to another quarter, alighting some distance down, and again picking their way upwards. When walking, they erect their tails, have a rather ungainly gait, and at a little distance present something the appearance of a large grey Goose. They are partial to feeding on spots where the sheep have been kept at nights when grazing in the summer pastures. These places have been called ‘tatters’ by the shepherds, and the grass on them keeps green and fresh long after the rest of the hill is dry and brown. They roost on the rocks and shelves of precipices, and return to one spot many successive nights. Their call is a low, soft whistling, occasionally heard at intervals throughout the day, but more generally at daybreak. It is most common in cloudy weather. The first note is considerably prolonged, and followed by a succession of low rapid whistles. This species has by far the most agreeable song of all our game birds. This call is only heard when the bird is at rest. When alarmed and walking away, it sometimes utters, at short intervals, a single low whistle, and when it gets on the wing the whistles are shrill and very rapid. However far it flies, the whistles are continued until it alights, and for a few seconds afterwards, but then slightly changed in tone to a few notes which seem in a strange manner to express satisfaction at being again on the ground. However odd the comparison, I can compare the whistling of these birds, when flying and alighting, to nothing but the different sounds produced by the wings of a flock of Pigeons when flying, and when alighting on some spot where they have to flutter a few seconds before they gain footing.”

The *Jer-moonals* are not remarkably wild or shy. When approached from below, on a person getting within eighty or one hundred yards, they move slowly uphill or slanting across, often turning to look back, and do not go very far unless followed. If approached from above they fly off at once, without walking many yards from the spot. They seldom, in any situation, walk far downhill, and never run, except for a few yards, when about to take wing. The whole flock rise together; their flight is rapid, downwards at first, and then curving, so as to alight on the same level. Where the hill is open and of great extent, it is often continued for upwards of a mile, at a considerable height in the air; when the space is more circumscribed, as is often the case on the hills they frequent in winter, it is of shorter duration, perhaps merely across or into the next ridge. “They feed on the leaves of plants and grass, and occasionally on moss, roots, and flowers; grass forms by far the greater portion of their food: they are very partial to the young blades of wheat and barley, when it is first springing up, and while it remains short, and should there be an isolated patch on the hill where they are, they visit it regularly night and morning. They never, however, come into what may be called the regularly cultivated parts. They are generally exorbitantly fat, but the flesh is not particularly good, and it has often an unpleasant flavour when the bird is killed at a high elevation, probably owing to some of the plants it there feeds upon. Though I have spent many summers on the snowy ranges, I never found the nest or eggs, but in Thibet I often met with broods of young ones newly hatched. There

were, however, several old birds, and probably more than one brood of chicks, so I could form no correct idea of the number in one brood. The eggs which have been found by travellers are about the size of those of a Turkey, but like those of the Grouse, are of a more lengthened form; their ground colour is clear light olive, sparingly dotted over with small, light chestnut spots."

The considerable height at which the Snow Pheasants live secures them from many persecutors to whom their congeners are exposed: nevertheless they also have their enemies, for all the larger and stronger Eagles regard them as welcome prey. "The Ring-tailed Eagle," says "Mountaineer," "is an inveterate annoyer of these birds; inhabiting exposed situations where there is nothing to conceal so large a quarry from his sight as he sails along the hill-side above them, they at once arrest his attention, and are driven backwards and forwards by this unrelenting tormentor all day long." They, however, often manage to escape his clutches, for the same author continues: "On the appearance of these birds of prey, which fortunately for them are not very numerous, they seldom wait till one of them makes a stoop, but on the enemy wheeling round near the spot where they are, immediately fly off to another quarter; the Eagle never flies after or attacks them on the wing, so that although he allows them little quiet while near their resort, he only occasionally succeeds in securing one." From man this bird has little to fear, as few persons pursue game at the heights they inhabit, and the hunting propensities of the Eastern nations are not very considerable. According to "Mountaineer" these hardy birds are easily kept in confinement, but (although they will eat grain) would probably not live long without an occasional supply of their natural green food of grass and plants. "They may," he tells us, "be kept without the least trouble in large cages, the bottoms of which, instead of being solid, are made of bars of wood, or iron wire, so that the birds being put out on the grass may feed through the interstices."

The RED-LEGGED PARTRIDGES (*Caccabis*). This section embraces several European species possessing strong bodies, short necks, and comparatively large heads. The wings, in which the third and fourth quills exceed the rest in length, are of medium size: the tail, composed of from twelve to sixteen feathers, is moderately long, and not completely concealed by its upper covers. The beak is long, but powerful; the foot of medium height, and furnished with a blunt spur or species of horny wart. The thick smooth plumage is principally of a reddish grey, shaded in some instances to slate-grey; the upper breast, part of the throat, and the thighs are brightly coloured. These birds are met with in Southern Europe, Western and Central Asia, Northern and Western Africa, Madeira, and the Canary Islands, everywhere inhabiting such barren or rocky situations as accord with their mottled plumage, and carefully avoiding tree-covered regions.

THE GREEK PARTRIDGE.

The GREEK PARTRIDGE (*Caccabis Græca*, or *C. saxatilis*) is of a blueish grey, shaded with red on the breast and mantle; the throat is white; a line encircling the throat, another on the brow, and a small spot on the chin are black; the feathers on the thighs are striped alternately yellowish brown and black; the rest of the under side is reddish yellow; the quills are blackish brown, with yellowish white shafts, and reddish yellow streaks at the edge of the outer web; the exterior tail-feathers are rust-red. The eye is reddish brown, beak coral-red, and foot pale red. The length of the male is from thirteen to fourteen inches, the breadth from nineteen to twenty inches; the wing measures six, and the tail four inches; the female is smaller than her mate.

This bird is met with in Central Europe, but more numerous in the most southern parts of that continent; as also in Turkey, Asia Minor, Palestine, and Arabia: in a westerly direction it would appear to venture but rarely beyond the limits of the Red Sea, and in India and Southern China is

represented by an almost identical species. It is a remarkable fact that, whilst such of these Partridges as inhabit Central Europe decidedly prefer sunny, verdure-covered spots lying beneath the snow-boundary of the Alps, those occupying warmer latitudes frequent the open plains and barren lowland tracts.

Tristram tells us that this is the commonest Partridge in the Holy Land: "In every part of the country, whether wooded or bare, it abounds, and its ringing call-note in early morning echoes from cliff to cliff, alike amidst the barrenness of the wilderness of Judea, and in the glens of the forest of Carmel. The male birds will stand erect on a boulder-stone, sending their cheery challenge to some rival across the *wady*, till the moment they perceive themselves detected; they then drop down from their throne, and scud up the hill faster than any dog, screening themselves from sight by any projecting rock as they run."

According to Linder Mayer, the Greek Partridge lays as early as February; in the Alps the female does not brood till the end of May at the earliest, and often as late as July. The nest is a mere hollow in the ground, beneath a low bush, and is slightly lined with moss, heath, or grass. In the south even this trifling preparation for the little family is omitted, and the hen contents herself with making a hole in the sand. The eggs, from twelve to fifteen in number, have a pale, yellowish white shell, delicately streaked with light brown; the mother alone broods, and when her young are strong enough, leads them forth to seek their food in company with her mate. Tschudi tells us that the young display extraordinary alacrity in concealing themselves on the first alarm of danger, and on this account the shooting of these much-esteemed birds is attended with no small difficulty, and frequently tries the sportsman's patience to the utmost.

THE CHUCKORE.

The CHUCKORE PARTRIDGE (*Caccabis Chukor*), a very nearly allied species, is found throughout the Western Himalayas, passing into Thibet, and in the salt range and alpine regions of the Punjaub, passing into Affghanistan.

"In our part of the hills," says "Mountaineer" (the North-western Himalayas), "the Chuckore is most numerous in the higher inhabited districts, but is found scattered over all the lower and middle ranges. In summer they spread themselves in the grassy hills to breed, and about the middle of September begin to assemble in and around the cultivated fields near the villages, gleaning at first in the grain fields which have been reaped, and afterwards, during winter, in those that have been sown with wheat and barley for the ensuing season, preferring the wheat. A few straggling parties linger on the hill-sides, where they breed, as also in summer many remain to perform the business of incubation in the fields. In autumn and winter they keep in loose scattered flocks, very numerous, sometimes to the number of forty or fifty, or even a hundred. In summer, though not entirely separated, they are seldom seen in large flocks, and a single pair is often met with. They are partial to dry, stony localities, never go into forests, and in the lower hills seem to prefer the grassy hill-sides to the cultivated fields. This may probably be owing to their comparatively fewer numbers, as I have observed that many others of the feathered race are much shyer and more suspicious of man when few in number than those of the same species in places where they are more numerous. Their call is a kind of chuckling, often continued for some time, and by a great many birds at once. It is uttered indiscriminately at various intervals of the day, but most generally when breeding. The Chuckore feeds on grain, roots, and berries, when caught young it becomes quite tame, and will associate with domestic poultry. From the beginning of October Chuckore-shooting is, perhaps, the most pleasant of anything of the kind; in the hills about some of the higher villages ten or twelve brace may be bagged in a few hours."

From a writer in the *Bengal Sporting Magazine* we learn that "the male is very bold, and is tamed for the purpose of fighting. In a domesticated state he makes no hesitation in offering battle to every animal, and pecks very fiercely, always searching for a tender part; the nose of a dog or the naked feet of the native servants immediately attract his attention, and he soon makes the object of his attack fain to run."

"When reclaimed," says another contributor to the same periodical, "this bird is peculiarly bold, fearless, and entertaining. It trots about the house, and is as familiar as a little dog. It is amusing to see its antipathy to quick motions in others. It will follow a servant who hurries into a room, pecking at his heels, scouring away when he attempts to turn upon it. It is still more persevering



THE RED-LEGGED PARTRIDGE (*Caccabis rubra*). ONE-THIRD NATURAL SIZE.

against the poor wight who moves backwards and forwards as he pulls the punkah. Half asleep at his task, he is roused by a fierce attack on his legs. He attempts to continue his work, and at the same time to drive away the intruder; but it is of no use, and he is at last obliged to call for assistance to rid him of his persecutor."

THE RED-LEGGED PARTRIDGE.

The RED-LEGGED PARTRIDGE (*Caccabis rubra*), a species inhabiting South-western Europe, differs from the last-mentioned bird in the deeper shade of the red on its mantle, and in the broad stripe and spots that adorn its neck. The back of the head and nape are bright rust-red, the crown of the head is grey, the breast and upper belly are greyish brown, the under belly and lower tail-covers reddish yellow; the long, light grey feathers on the thighs are marked with whitish red and dark brown streaks, edged with black. A white line, commencing on the brow, passes over the eye to the sides

of the throat, the centre of which is pure white. The eye is light brown, the eye-ring cinnabar-red, beak crimson, and foot pale carmine-red. The female is recognisable from her mate by the inferiority of her size, and is without the spur-like wart upon her tarsus. The male is fourteen inches and a half long and twenty broad; his wing measures six and the tail four inches and a half.

This bird inhabits France, Italy, Spain, Portugal, and the Channel Islands, and has been recently introduced into England, where it is now plentiful. It is more wild than the Common Partridge, and stronger on the wing, and will run sturdily before the dogs. It prefers heaths, commons, and waste



THE COMMON PARTRIDGE (*Perdix cinerea*, or *Starna cinerea*). ONE-THIRD NATURAL SIZE.

land, but also frequents turnip fields. The nest is slightly formed of grass and leaves, and placed in a field of corn or grass. "Two or three instances are recorded," says Mr. Yarrell, "in which a nest with eggs were found in the thatch, or upon the top of low stacks."

The eggs are of a reddish yellow-white, spotted and speckled with reddish brown, one inch and seven and a half lines long, and one inch and three lines broad, and from fifteen to eighteen in number. The young leave the nest soon after they are hatched. Their food is the same as that of the Common Partridge.

THE BARBARY PARTRIDGE.

The BARBARY PARTRIDGE (*Caccabis petrosa*), another member of the above group, is principally recognisable by the reddish brown band, spotted with white, that encircles its throat. The brow and

sides of the head are light grey, shading to a blueish tint on the wing ; the throat and eyebrows are whitish grey, the breast is of a blueish tint, shaded with grey, the thighs are striped yellowish brown and black ; the rest of the under side is blueish grey. Some of the mantle-feathers are marked with reddish grey ; the eye, beak, and foot of this bird are similarly coloured to those of its congeners. Its size is somewhat less than that of the species already described. The Barbary Partridge inhabits Greece, Sardinia, and occasionally the South of France ; it is numerous met with in North-western Africa. Naturalists are by no means agreed as to the situations it prefers, some informing us that it selects lowland districts or rising ground in the vicinity of corn-fields, whilst on the contrary, Bolle, who is particularly accurate in his observations, states that in the Canary Islands it quite as frequently lives and breeds on rocky heights as in the valleys and open country. This savoury game we are told by the last-mentioned authority, swarms in such numbers on four of the Canary Islands as to be occasionally regarded as an intolerable nuisance. Salvadori informs us that the period of incubation commences early in February, and Bolle, that the eggs, from four to twelve in number, are hatched in twenty-two days. After the breeding season the pairs collect into parties, but if alarmed and separated appear to be at little trouble to seek for and rejoin their former companions.

THE COMMON PARTRIDGE.

The COMMON PARTRIDGE (*Perdix cinerea*, or *Starna cinerea*) is distinguishable from the above birds by the coloration of its plumage, by the plates protecting the feet forming two distinct rows both before and behind, by the absence of the spur-like wart on the tarsus, and by the formation of its wing, the third, fourth, and fifth quills of which are longer than the rest ; the tail is composed of sixteen or eighteen feathers. In this species the brow, a broad line above and behind the eye, and the sides of the head and throat, are light rust-red, the rest of the head is brown, marked with yellow, and the grey beak is striped with rust-red ; the feathers are delicately traced with black zig-zag lines, and have light shafts : a broad dark band, varied with black, adorns the breast, and passes along both sides of the belly, where it is interrupted by various rust-red streaks, surrounded by a white line. The white belly has a large horseshoe-shaped brown spot at its centre ; the rump-feathers and those in the centre of the tail are streaked with shades of brown ; the primary quills are pale brownish black, spotted with reddish yellow. The eye is nut-brown, the eye-space and stripe that passes behind it are both red, the beak is blueish grey, and the foot reddish grey or brown ; the female is smaller than her mate, and less pleasing in her colour : her back is darker, and her belly without the brown patch in its centre. The male is twelve inches long and twenty broad, and the wing measures six, and the tail three inches.

The Common Partridge is almost exclusively a European bird. Mr. Gould states that in his extensive observations he has never met with a single species either from Africa or Asia. Temminck, however, tells us that it visits Egypt and the shores of Barbary, and Russian naturalists have included it among the birds found between the Caspian and Black Seas, south of the Caucasus.

In Europe it is extensively distributed in all suitable localities, and inhabits all the level parts of England and Scotland.

It frequents cultivated land and corn-fields, ranging sometimes into neighbouring waste ground covered with furze and broom. It runs with great rapidity when alarmed, but often squats close to the ground and flies off when nearly approached. The food of the Partridge consists of corn, grain of various kinds, peas, seeds, and tender shoots of grass ; it also consumes insects and larvæ of many kinds, that would otherwise injure the crops. It feeds principally in the early morning and late in the evening, when coveys of these birds may be met with in fields of corn or stubble, according to the season. During the day they frequent pasture lands, and sun and dust themselves in dry bare

places, or bask under hedgerows. In the evening their sharp shrill call-note is heard as they collect together to roost on the ground. The coveys, which assemble in the latter part of the autumn, and keep together during the winter, separate again early in the spring, when pairing-time begins.

The nest is merely a slight hollow in the ground, lined with a few dried leaves, or bits of grass scraped together; it is usually placed beneath a tuft of grass, among standing corn, or even by the road-side.

The eggs are from twelve to twenty, and of a greenish brown tint; occasionally, a greater number are found, but these are not supposed to be the produce of one bird. The female alone broods, guarding her nest with zealous anxiety, but her partner is also on the watch, lest danger should approach.

The following instance of the care of the Partridge for her eggs is related by Mr. Jesse:—“A gentleman living near Spilsby, in Lincolnshire, who was one day riding over his farm superintending his men as they ploughed a piece of fallow land, saw a Partridge glide off her nest so near the foot of one of his plough-horses that he thought the eggs must have been crushed: this, however, was not the case; but he found that the old bird was on the point of hatching, as several of the eggs were beginning to chip. He observed the old bird return to her nest the instant that he left the spot. It was evident that the next round of the plough must bury the nest and eggs in the furrow. His surprise was great, when returning with the plough, he came to the spot and saw the nest indeed, but the eggs and bird were gone. An idea struck him that she had removed her eggs, and he found her before he left the field sitting under the hedge upon twenty-one eggs. The round of ploughing had occupied about twenty minutes, and in this short time she, assisted by the cock bird, had removed the twenty-one eggs to a distance of about forty yards.”

Another interesting anecdote is thus related by Mr. Murkwick:—“As I was hunting with an old pointer the dog came upon a brood of very small Partridges, the old bird cried, fluttered, and ran tumbling along, just before the dog's nose, till she had drawn him to a considerable distance, when she took wing and flew still further off, but not out of the field; on this the dog returned to me near the place where the young ones lay concealed in the grass. This the bird no sooner perceived than she flew back again to us, settled before the dog's nose again, and by rolling and tumbling about drew off his attention from her young and thus preserved her brood a second time. I have also seen,” continues the same writer, “when a Kite has been hovering over a covey of young Partridges, the old birds fly up at the bird of prey, screaming and fighting with all their might to preserve their brood.”

Of the same daring spirit Mr. Selby gives the following remarkable instance:—“A person engaged in a field not far from his residence, had his attention arrested by some objects on the ground, which upon approaching he found to be two Partridges, a male and female, engaged in battle with a Carrion Crow; so successful and so absorbed were they in the issue of the contest, that they actually held the Crow till it was seized and taken from them by the spectator of the scene. Upon search, the young birds (very lately hatched) were found concealed in the grass. It would appear that the Crow (a mortal enemy to all kinds of young game), in attempting to carry off one of these, had been attacked by the parent birds, with the above singular result.”

The eggs of Partridges are frequently hatched under a Domestic Hen, and the young reared on ants' eggs, curds, and grits, with a little green food, when old enough they should be fed with grain. They are easily tamed, though it is said they never wholly forget their wild origin. An account is given by Daniell of one of these birds that became an inmate of a clergyman's house, which long after its full growth entered the parlour at breakfast and other times, received food from any hand, and stretched itself before the fire, the warmth of which it seemed to enjoy.

The FRANCOLINS (*Francolinus*) are distinguishable by their moderately long, powerful, and slightly-hooked beak, and by the two spurs upon their foot. The tail, composed of fourteen feathers, is either quite straight or gently rounded at its extremity; the third or fourth wing-quill exceeds the rest in length. The thick plumage is often much variegated. The male and female are usually alike in size, colour, and markings. These birds inhabit the southern portions of Asia, and are very numerous met with on the continent of Africa. Some species frequent level plains, while others live in forests; when disturbed they conceal themselves in the brushwood in the thickest part of the jungle, not venturing forth again till all danger has disappeared. Should no hiding-place be near, they endeavour to escape by running, and have only recourse to their wings when the danger is very urgent. In their general habits they very much resemble the true Partridges; they breed at the same season, testify the same care and devotion for their young, and are equally prolific. They differ, however, from Partridges, inasmuch as they do not frequent cultivated grounds, but prefer the neighbourhood of woods, where they seem to select damp localities overgrown with reeds. They live upon berries quite as much as upon grain, and seek eagerly for such worms and insects as abound in marshy soil. The African species feed on small bulbous roots which they dig from the ground with their beaks. They are very fond of perching upon trees, especially during the night, and their call is much more harsh and noisy than that of the Partridge. Their flesh is excellent. (See XXIX.—Coloured Plate—Sanguine Francolin, *Ithaginis cruentus*.)

THE BLACK PARTRIDGE.

The BLACK PARTRIDGE (*Francolinus vulgaris*) is of a deep black on the brow, cheeks, and breast; the feathers on the back of the head are edged with red, and streaked with white; the ear-feathers are pure white; those on the centre of the throat are reddish brown, and form a broad collar; the mantle-feathers are black, bordered with red, and spotted with white, those of the lower back finely striped black, and more or less spotted and lined with white. The thighs and lower tail-covers have the feathers tipped with brown; the quills are black and red, those at the exterior black and grey at their roots. The eye is brown, the beak black, and the foot yellowish red. This species is from thirteen to fourteen inches long, and twenty broad. The wing measures five inches and three-quarters, and the tail three inches and a half.

Jerdon informs us "that the Black Partridge is found throughout the whole of Northern India, from the Himalayas to the valley of the Ganges, and southwards to Sindh and Guzerat, eastwards through Dacca to Assam, Sylhet, and Tipperah, and on mountains 4,000 feet above the level of the sea." It frequents by preference grass meadows near water, cultivated fields of corn, mustard, or pulse, and any patch of moderately high green herbage, also low jungle, and is not unfrequently flushed in moderately long grass interspersed with bushes, even at some distance from water.

"In the cold weather," says Jerdon, "after the young have flown and separated from their parents, they may be found scattered over a greater expanse of country than during the hot weather and rains, and are often to be found in fields far from water. This Partridge is stated occasionally to perch and roost on trees; but this is certainly a rare habit, at least with this species."

During pairing-time the call of the cock bird may be frequently heard at sunrise, and towards evening. Malesherbes represents it as an agreeable sound, resembling the syllables "Tre-tre-tre."

A Sicilian proverb says that the bird wishes to declare his own value, and that he may be purchased for three coins. This cry has been represented by many different syllables that, however, would scarcely give a correct idea of its sound to those who have not heard it. The Mussulmans say that it repeats the pious words, "Dobhan teri kudrut," others that it calls out, "Lussun, piaz, udruk," or garlic, onions, ginger. Adams represents the cry as "Lohee-wha-which-a-whick," and some one

else as "Juk-juk-tee-tar." One writer has compared it to the harsh grating blast of a cracked trumpet; but Jerdon says that it is far from being a loud call, though sufficiently audible for a great distance. This cry is almost always uttered from a slight eminence, such as a bank, ant-hill, or clump of earth, and where the birds are numerous, answering cries may be heard from all sides. These birds generally call much after rain, or after a heavy dew.

The Francolin is not shy, but when it finds itself pursued, runs quickly for two or three minutes, avoiding open ground, before it takes wing; its flight is strong and steady, but slow, and not long continued. When alarmed it usually only rises to the nearest bush, and thence descends again to the ground.

In India, according to Jerdon, the hens brood from May to July. The nest is usually in high grass, sometimes in indigo fields, and occasionally in plantations of sugar-cane. The eggs are ten or twelve, and sometimes even fifteen in number, of a pale blueish white or pale green tint. It is probable that the mother alone broods.

A few years ago many of these birds were shot in Sicily, but now they seem to have almost disappeared from that island. In Syria and Palestine, according to Tristram, "they are found in the rich lowland plains of Gennesaret, Acre, and Phœnicia, concealing themselves in the dense herbage and growing corn, where their singular call can be heard resounding at daybreak from every part of the plain, while not a bird can be seen." In the *Bengal Sporting Magazine* for 1841, we are told that seventy-five brace were shot by one sportsman in the neighbourhood of Karnal in the Upper Provinces; but it is everywhere more scarce than it was formerly. The flesh of this bird is good, especially when kept for a few days, and eaten cold. The beautiful spotted feathers of the lower plumage were used in some parts of the country to make into capes, but are now scarcely procurable.

The BARE-NECKED PHEASANTS (*Pternistes*) constitute a group of African Francolins, recognisable by their comparatively slender body, moderately long neck, and small head. The wing (in which the fourth quill exceeds the rest in length) is much rounded, the tail, over which the pinions do not extend, is almost straight at its extremity. The beak is of medium size, the foot high, and armed with a spur.

THE RED-NECKED PHEASANTS.

The RED-NECKED PHEASANTS (*Pternistes rubricollis*) are principally of a pale greyish brown, almost all the feathers, except those on the head, being decorated with a triangular yellowish white spot, and edged with white. The primary quills are black, bordered with yellow on the outer, and spotted with the same shade on the inner web; the tail-feathers are irregularly striped with yellow and brown. The eye is light brown, the bare circle that surrounds it cinnabar-red; a patch upon the throat is yellow, edged and spotted with black; the beak deep brownish grey, with red base and nostrils; the foot dark brownish grey. The male is sixteen inches long and twenty-five broad; his wing measures seven inches and two-thirds, and the tail four inches; the female is an inch and a half shorter and one inch narrower than her mate.

As far as has been at present ascertained, the habitat of this species extends over all the low-lying country near the African coast, from the northern boundary of Abyssinia to Somali; we have never seen it upon mountains, although it occasionally frequents their immediate vicinity. The Red-necked Pheasant, like other Francolins, is extremely shy, and if disturbed runs with great quickness to a place of security, and only when very hard pressed employs its wings. Its flight is noisy but light, and resembles that of the *Lyrurus tetrrix*; upon the ground, however, it is far more at home than in the air, running over its surface with almost incredible ease and rapidity. Like its

congeners, this species has but one mate, and lives on excellent terms with its companions, as several pairs and their young usually keep together, forming small parties. In spite of this usually peaceful mode of life, the males, like the rest of their kind, occasionally indulge in regular pitched battles. Their cry is very similar to that of the Partridge; about April or May the males become much excited, and may be heard calling almost incessantly during the evening hours. A nest found by Brehm in a thick, dark bush near the ground, was formed of leaves and feathers, and contained within its deep walls, six pure white eggs, closely resembling those of a Domestic Fowl. "My attention," he tells us, "was attracted to the nest in the first instance by the movements of the hen, who ran out of the bush at my approach, and placing herself in an open space near me, spread and beat her wings, and by her cries endeavoured to lure me from the spot. I carefully marked the bush that contained the brood and at once pretended to follow the anxious mother, who, after leading me some five hundred paces, suddenly rose and flew back to her home in a series of large curves quite after the manner of the rest of her congeners. The cock was not to be seen, but no doubt was in the immediate vicinity." The flesh of this species is much esteemed, and large numbers are snared for the table. In many European houses it is to be seen caged, yet, though it endures captivity well, it never becomes really tame.

The AMERICAN PARTRIDGES (*Odontophori*) are delicately-framed birds, possessing a short high beak, compressed at its sides, high, much arched, and furnished at its margin with two strong, tooth-like projections. The moderately long tail is composed of twelve feathers, the external of which are frequently much shortened; the fourth, fifth, and sixth quills of the very decidedly-rounded wings exceed the rest in length; the tarsi are high, without a spur, but the toes are long and furnished with long, sharp claws. The thick plumage is more or less brilliantly coloured and always beautifully marked; some species have a bare patch around the eye. All the members of this group are strictly American, and by far the greater number of them are natives of that portion of the continent lying between 30° north latitude and the equator. Four species are now included in the fauna of North America, and four have been discovered in Brazil; some few extend their range to the larger of the West Indian Islands, and several others inhabit the vast mountain ranges of the Andes.

The American Partridges form a large and well-defined group, distinguishable from the Partridges and Quails of the Old World by the absence of any spur, or spur-like appendage on the tarsi, and by the tooth-like processes in the upper mandible. They are pugnacious in their disposition, seem arboreal in their habits, and deposit their eggs in a depression of the ground or in a very inartificial nest. Their food consists of seeds, berries, fruits, and the tender leaves of grass and other vegetables. Their flesh is white, tender, and well flavoured. In the morning and evening twilight they perch on a low branch near each other, when the males frequently give utterance to their cries, which reverberate through the forest to a great distance. If alarmed when on the ground, they usually hasten to some neighbouring branch, along which they run, and crouching down conceal themselves amongst the foliage.

The female lays from eight to fifteen eggs.

THE CAPUEIRA PARTRIDGE.

The CAPUEIRA PARTRIDGE (*Odontophorus dentatus*), the largest species of the entire family, represents a group of powerfully-built birds, with comparatively long necks and moderate-sized heads. Their short tail, rounded at its extremity, is formed of soft feathers; the short, decidedly-rounded wing has its fifth and sixth quills longer than the rest; the strong, hooked beak is compressed at its sides, and has the high upper mandible much vaulted; the margins of the lower mandible are furnished

with two well-defined tooth-like appendages. The tarsi are high, the toes long, armed with sharply-pointed hooked claws, and protected by large horny scales. The plumage, which is alike in the two sexes, is prolonged into a crest on the head; the eye is surrounded by a broad, brightly-coloured skin. This species is yellowish brown on the nape, back, wings, and tail; the crown of the head is brown, and a cheek-stripe that extends to the nape is reddish yellow, dotted with a lighter shade: the feathers on the throat and upper portion of the back are spotted with brown and black, and striped with yellow; those on the shoulders have a large black triangular patch on the inner web. The feathers of the wing-covers have a pale, yellow, heart-shaped spot at their tip, whilst the lower shoulder-feathers and exterior secondaries are edged with reddish yellow on the inner web, and streaked with black, the centre part of each being also varied with reddish grey and brown. The brown primary quills have the outer web dotted with white, and the shaft grey; the secondaries are marked with reddish yellow on the outer web. All the feathers on the hinder parts of the body and tail are of mottled reddish yellow in the centre, with a pale yellow border, and a black spot at the tip; those on the under side are slate-grey, edged with brown. The eye is brown, the bare ring that surrounds it deep flesh-red, the beak black, and the foot greyish red. The female is of paler hue, and the young show more reddish brown in their plumage than the adult male. The length of the body is sixteen inches and a half, the wing measures three inches and a half, and the tail three inches.

This bird is found in suitable localities in most parts of Brazil, from the Rio de la Plata to the Amazon. We are indebted to the Prince of Wied for what we know of its life and habits.

"This species," says the prince, "is called 'Capueira' by the Brazilians. Its habits and mode of life are very similar to those of the Hazel Grouse, or Gelinotte (*Bonasia sylvestris*). It never frequents the open country, but confines itself entirely to the thick woods. In the early part of the year the 'Capueira' lives in pairs, and after the breeding season the families remain in coveys of from ten to sixteen or more in number. These birds run very quickly, and procure their food among the dry leaves on the ground in the midst of the extensive woods. The stomachs of such as I examined contained fruits, berries, insects, small stones, and a little sand. The part of the country in which I met with them is the eastern portion of Southern Brazil, from Rio de Janeiro to 13° south latitude; by Spix they appear to have been found still farther north. In the vast forests bordering the rivers Mucuri, Alcobaça, Belmonte, and Ilheo they were very common, and we frequently killed them for the sake of their flesh, which is excellent. Their loud and remarkable voice is heard only in the forests, where it reverberates to a great distance. Azara states that the cry is uttered by both sexes, but I believe it is emitted by the male bird only. Like the Domestic Cock in Europe, it frequently aroused us at the break of day, bidding us, as it were, continue our researches among the grand but almost impenetrable forests of that magnificent country. They commenced calling before daybreak, thus affording us ample time for breakfasting, and enabling us to start by the dawn of the young day."

Azara tells us that the voice of the Capueira consists of two notes; but on this point he is incorrect, as it comprises three or four notes, which are frequently and very quickly repeated: Morning and evening the Capueiras perch on a branch in a line, very near to each other, and at this time the male birds frequently give utterance to their cry, which Azara states to resemble the word "uru," but it appeared to me very different. The nest found by me in the woods near the fine lake called Lagoa d'Arara (Macaw Lake) was placed on the ground, and contained from ten to fifteen pure white eggs, which coincides with Sonnini's account; while Azara's assertion that they are of a violet-blue is doubtless a mistake, which may probably have arisen, as M. Temminck suggests, from his having mistaken the eggs of a Tinamou for those of a Capueira. Some travellers have asserted that they have found the nests of this bird on trees, and that they were placed in such situations in order

that they might be secure from the attacks of snakes and other enemies ; but this is also a mistake, for were such a precaution necessary, it would be adopted by all the birds in the country, whereas numerous species, especially the Tinamous, constantly breed on the ground. The sport afforded by the Capueira very closely resembles that afforded by the Hazel Grouse. When a covey was disturbed by the pointers they flew to the trees, the motion of their wings causing the same rustling sound as those of the Partridge. Occasionally they might be killed very easily ; at other times it was very difficult to sight them among the dense foliage of the woods. Their flesh, which is very palatable, forms an excellent article for the table.

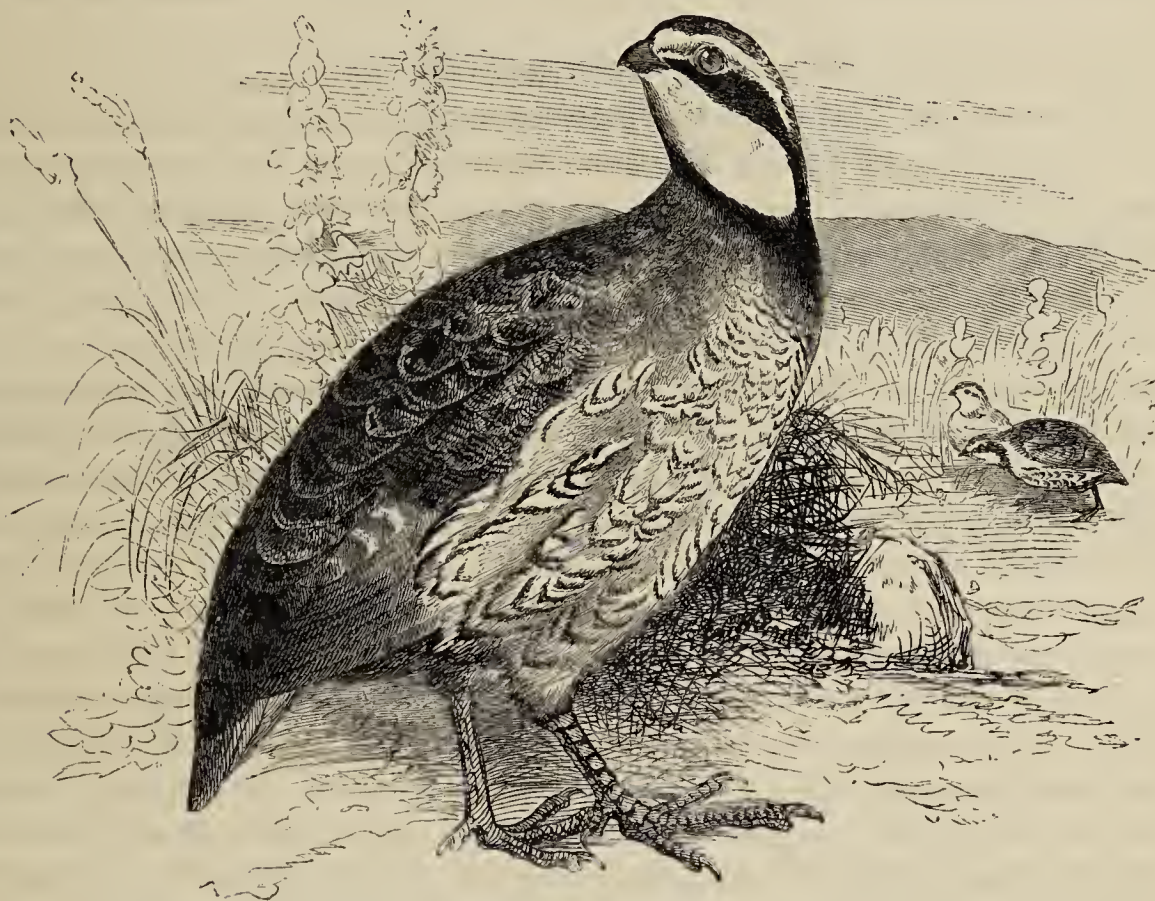
THE VIRGINIAN OR AMERICAN PARTRIDGE.

The VIRGINIAN OR AMERICAN PARTRIDGE (*Ortyx Virginianus*) represents a group distinguishable by the following characteristics :—Their body is short and powerful, with the neck and head of medium size ; the beak is strong, short, much vaulted, and has the lower mandible incised, the upper mandible terminates in a hook, while the margin of the lower portion near its apex presents two or three distinct notches. The moderate-sized and arched wing has the fourth quill longer than the rest ; the rounded tail is composed of twelve feathers, and the foot is protected by rows of smooth, horny plates in front, and covered with small scales at the back and sides. The plumage is glossy, and prolonged into a crest on the head. In the male all the feathers of the mantle are reddish brown, spotted and lined with black and edged with yellow ; those on the under side are whitish yellow, striped with reddish brown and marked with black. Two bands, the one white, the other black, pass across the brow ; the white throat is separated from the sides of the neck—which is mottled with black, brown, and white, by a black line. The upper wing-covers are principally reddish brown ; the dark brown primary quills are bordered with blue on the outer web ; the secondaries are irregularly striped with brownish yellow ; the centre tail-feathers are greyish yellow, dotted with black ; the rest are greyish blue. The eye is reddish, the beak dark brown, and the foot greyish blue. The female has more yellow on the brow and neck, and the rest of her plumage is less clearly marked than that of her mate ; the young resemble the mother. This species is nine inches long, and thirteen inches and five-sixths broad ; the wing measures four inches and a half, and the tail two inches and a quarter.

Canada forms the northern, the Rocky Mountains the western, and the Gulf of Mexico the southern limit of the range of these birds. They have been introduced into the island of Jamaica, where they thrive, breeding in that warm climate twice in the year. In the southern part of the United States they are stationary, but in the north they make yearly expeditions, which resemble migrations. They are principally met with in open fields, or about fences sheltered by bushes or briars, and they sometimes visit the woods, but are rarely found in the depths of the forest. In their general demeanour they very much resemble our own Partridge. They run nimbly and fly swiftly, making a loud whirring sound with their wings. When chased by dogs they take refuge in the trees, where they remain until danger is past, walking with ease on the branches. Their usual cry is a clear whistle. The love-call of the male consists of three clear notes, the two last being the loudest, and resembling the syllables, "Ah ! Bob White !"

"The male," says Audubon, "is seen perched on a fence, stake, or on the low branch of a tree, standing nearly in the same position for hours together, and calling, 'Ah ! Bob White,' at every interval of a few minutes. Should he hear the note of a female, he sails directly towards the spot whence it proceeded. Several males may be heard from the different parts of a field, challenging each other, and should they meet on the ground they fight with great courage and obstinacy until the conqueror drives off his antagonist to another field." About the beginning of May the female proceeds to build her nest ; this is placed on the ground, close to a tuft of grass, and partly sunk in

the earth : it is formed of leaves and fine dry grass, is of a circular form, and covered above, with an opening at the side. The eggs are of a pure white, and rather sharp at the smaller end. Both parents assist in hatching the eggs. When the young are freed from the shell they leave the nest, and are led in search of food by their mother, who shelters them with most assiduous care. If danger threatens, she throws herself across the path of the intruder, beating the ground with her wings as if severely wounded, and uttering notes of alarm to decoy the stranger into pursuit of herself, and give warning to her young to conceal themselves in the high grass till the danger is past, when, having allured her pursuer to a distance, she returns, and leads them safe home. The American Partridge usually rears only one brood in the year, but should this be destroyed she immediately



THE VIRGINIAN PARTRIDGE (*Ortyx Virginianus*). ONE-HALF NATURAL SIZE.

prepares another nest, and even should mischance befall this also, a third batch of eggs is laid. This Partridge has been occasionally employed to hatch the eggs of the Domestic Hen.

“A friend of mine,” says Wilson, “informs me, that of several hens’ eggs, which he substituted for those of the Partridge, she brought out the whole ; and that for several weeks he occasionally surprised her in various parts of the plantations, with her broods of chickens, on which occasions she exhibited much alarm, and practised her usual manœuvres for their preservation. Even after they were considerably grown and larger than the Partridge herself, she continued to lead them about ; but though their notes or call were those of common chickens, their manners had all the shyness, timidity, and alarm of young Partridges : they ran with great rapidity, and squatted in the grass exactly after the manner of the Partridge. Soon after this they disappeared, having probably been destroyed.”

In summer the food of these birds consists of insects, berries, and grain, and in the autumn they revel in the fields of buckwheat and Indian corn. When winter comes, and their supplies have disappeared, those in the northern districts commence their southward course, and many perish during

these journeys. Early in October the shores of the large rivers are covered with flocks of them, which rove along the margin of the river and cross towards evening, the weaker ones often falling and perishing in the water. After the principal streams have been thus crossed, the flocks distribute themselves about the country, and resume their usual mode of life. During the severity of winter they often suffer from scarcity of food, and will then approach the dwellings of men, and become half domesticated, visiting the barns and mixing with the poultry, to share their food. The eggs of this species have frequently been hatched by the Domestic Hen; two of these birds that had been brought up in this manner, according to Wilson, associated with the cows, followed them to the fields, returned with them in the evening, stood by them while milked, and again returned with them to pasture. These remained during winter, lodging in the stable, but as soon as spring came they disappeared.

Dr. Bachmann attempted to domesticate the American Partridge, and gives us the following account of his proceedings:—"The eggs had been obtained from the fields, and were hatched under a Bantam hen. By confining the young with their foster mother for a few days they soon learned to follow her like young chickens. They were fed for a couple of weeks on curds, but soon began to eat cracked Indian corn and several kinds of millet. They were permitted to stray at large in my garden; but fearing that they might be induced to fly over the enclosure and stray away, I amputated a joint of the wing. There was no difficulty in preserving them during the summer and winter, and they became so very gentle that they were in the habit of following me through the house, and often seated themselves for hours on the table at which I was writing, occasionally playfully pecking at my hand and running off with my pen. At night they nestled in a coop, placed for that purpose in the garden. The cats in the neighbourhood, unfortunately for my experiment, took a fancy to my birds and carried off several, so that at the breeding season my stock was reduced to two females, with a greater number of males; the latter now commenced their not unmusical notes of 'Bob White,' at first low, but increasing in energy and loudness till they were heard throughout the whole neighbourhood. These notes were precisely similar to those of the wild birds, affording a proof that they were natural, and not acquired by an association with others of their own species, as these birds had no opportunity of hearing any other notes than those of the poultry on the premises. As the spring advanced, the males became very pugnacious, and great contests took place between themselves, as well as with the Pigeons and the young poultry that occasionally intruded on their domicile. In May the hens commenced laying, both in one nest, and the eggs were hatched under a Domestic Hen."

Dr. Bachmann was prevented carrying out his experiments further, but other observers have been more fortunate, and have without trouble reared many of these delicate birds in closed rooms. Their great fertility is very favourable to their increase, wherever it is wished that they should be naturalised.

Several attempts have been made to introduce this species into England, and from time to time specimens have been shot in different parts of the country.

The American Partridge is easily caught by means of snares and traps of various descriptions. Many are shot, but they are most frequently netted in the following manner:—A number of persons, furnished with a net, ride along the fences and thickets where the birds resort, one of the party simulating the call of the bird, which is soon answered by a covey; the party approach in an apparently careless manner to ascertain the position and number of the others; and then a horseman furnished with a net gallops a hundred yards in advance, and places it so that his companions can drive the Partridges into it. In this manner fifteen or twenty Partridges may be caught at one driving, but a pair out of each flock usually receive their liberty for fear that the breed should be destroyed.

The CALIFORNIAN PARTRIDGE (*Lophortyx Californianus*) and GAMBEL'S PARTRIDGE (*Lophortyx Gambelii*) represent an American group principally remarkable for the crest that adorns their head. These birds have a powerful body, short neck, and moderately large head. The short arched wing is rounded at its extremity, and has its fourth or fifth quills longer than the rest. The tail, composed of twelve feathers, is short and remarkably graduated; the beak is short, strong, and much arched at its culmen; the foot is of medium height, and the thick plumage compact and glossy. At the top of the head rises a crest, formed occasionally of from two to ten, but generally of from four to six feathers; these are slender at the roots, becoming gradually broader towards the tips, which incline forward, and have somewhat the form of a sickle. This crest is much developed in the males. The coloration of the plumage, though by no means gorgeous, is both beautiful and brilliant.

THE CALIFORNIAN PARTRIDGE.

The CALIFORNIAN PARTRIDGE (*Lophortyx Californianus*) has the feathers on the top of the forehead of a straw-yellow, with dark shafts, these being surrounded by a dark line that passes over the eyes. The crown of the head shows two shades of brown; the long feathers that cover the nape are blueish grey, with black shafts and edges, and two white spots at their tips. The back is olive-brown, the throat black, encircled by a white band, the upper breast is blueish grey, its lower portion yellow, each feather being lighter at the tip, and bordered with black; the feathers on the belly are brownish red, edged with a darker shade, those on the sides brown, with white shafts, and those on the lower tail-covers light yellow, with dark shafts. The quills are brownish grey, the secondaries bordered with a yellowish tint; the tail is pure grey. The eye is dark brown, the beak black, and foot deep lead-colour. The female is of a dull whity-brown on the forehead, and brownish grey on the crown; the throat is yellowish, with dark markings, the breast dull grey; the rest of the plumage resembles that of the male, but is duller and fainter.

The Californian Partridge was first observed during the visit of the unfortunate ship *La Perouse* to California, since which time it has been found to inhabit in abundance all suitable localities in that country; the accounts of its life and habits are, however, as yet very scanty.

"These beautiful birds," says Gambel, "so extraordinarily plentiful throughout California, assemble in the winter in numerous swarms of more than a thousand individuals, if the woods are able to provide for that number, and are equally plentiful on bushy plains and the declivities of hills. They exhibit great watchfulness and activity, and when pursued run nimbly away into concealment; if suddenly started they take refuge in trees, crouching close to the horizontal branches like squirrels—in which position the great resemblance of their colouring to that of the bark of the tree, makes it very difficult to detect them." The nest is usually placed on the ground at the foot of a tree or beneath a bush. The eggs are generally numerous and placed in a shallow hollow, scooped at the foot of an oak, and spread over with a few leaves and a little dried grass. Gambel found twenty-four eggs in one nest, but thought that possibly they were the produce of two hens—fifteen being the usual number of the brood.

Freyborg, who also observed this bird in its native country, says that it is stationary, or at least wanders only to a short distance, and feeds on grass, seeds, bulbous roots, garlic, plants of various kinds, berries, and insects, preferring thick bushes to any other localities. It seldom moves more than forty or fifty paces, and scarcely ever strays from the shade of the woods to open spots; it holds out for some time before the hounds, and flies to the nearest tree. In the winter it digs long burrows under the snow. In California these birds are shot from the trees with a small rifle, and they are also chased by the help of dogs—their flesh being in great request, and considered to resemble that of the Hazel Grouse (*Bonasia sylvestris*).

Captain Beechey brought home several of these birds, but the females all died, and of the males which were presented to the Zoological Society, scarcely one survived.

Since this time several others have been imported to different parts of Europe, and two pairs brought by Deschamps laid and hatched a numerous brood—other experimenters have been equally successful.

GAMBEL'S PARTRIDGE,

GAMBEL'S PARTRIDGE (*Lophortyx Gambelii*) resembles the species last described in its general appearance, but has the black patch on the face larger, and only a very small portion of



THE CALIFORNIAN PARTRIDGE (*Lophortyx Californianus*).

the brow is white. The back of the head is bright reddish brown, streaked with light yellow. All its hues are brighter and more glossy than those of the Californian Partridge.

“It was late in June,” says Coues, “when I arrived in Arizona, where I heard that this Partridge was especially plentiful. In my first day’s sporting I stumbled, so to say, over a covey of young poults that were just escaped from the egg, but the nimble little creatures ran and concealed themselves with such wonderful celerity, that I could not catch a single one. I thought that I had mistaken for them the *Oreortyx pictus*, and wondered to find young ones of these so late in the year. But it was not yet late for Gambel’s Partridge, as I found several broods in August only a few days old. In the following year I observed that the old birds had paired by the end of April, and at the beginning of June I saw the first young ones. I would also notice that breeding goes on rapidly in the months of May, June, July, and August, and that probably two or possibly three broods

are hatched in one year. The greatest number of poults in one brood are, as far as I could learn, between fifteen and twenty-six, the smallest from six to eight. On the first of October I found some half-grown young, the greater number were already nearly or quite as large as their parents, and so fledged that they might well attract the attention of a sportsman. As long as the young brood require their parents' care they keep together in a small collected flock, and if this is threatened each little chick runs away so quickly and squats in some convenient place that it is very difficult to induce them to rise. If this can be done, the covey fly all close together, but usually quickly alight on low branches of trees or bushes, but often also on the ground, and here they generally sit, sometimes



THE COMMON QUAIL (*Coturnix communis*), ONE-HALF NATURAL SIZE.

stiffly in a heap, and while they think they are well concealed, allow themselves to be approached within a few paces. Later in the year, when they have reached their full growth, they more seldom take to the trees, become more cautious, and are approached with greater difficulty. The first intimation that a covey is near, is given in a single note, repeated two or three times, then follows a rustling of dry leaves, and the whole troop hasten, as quickly as they may, yet one step farther and then all rise with a whirring noise, and disperse themselves in different directions."

With the exception of close fir-woods, without undergrowth, these birds people every locality, but seem to prefer thick bushes, and especially osier holts, on the borders of streams. Dr. Gambel tells us that he saw them in flocks of fifteen or twenty in company with another species in a barren tract, where several podded kinds of *Prosopis*, with low-spreading branches, afforded them excellent covert, and the seeds of bushy *Malvas*, *Chænopodia*, and *Artemisia* probably served them for food. In this

dreary region, where one would suppose it impossible for any creature to subsist, they were running about in small parties, occasionally uttering a low guttural call of recognition; this call is often composed of several notes, and very different from that of the common species. When in flight they emit a sharp whistle, and conspicuously display their long crest.

The QUAILS (*Coturnices*) are recognisable by their comparatively small size, powerful, compact bodies, proportionately long, pointed wings, and very short, rounded tail, formed of twelve soft feathers, and almost concealed by the long feathers on the rump. The beak is small, and high at its base, the foot short, or of moderate size, without a spur, and the plumage, which completely covers the head, alike in both sexes. These birds are met with over a larger portion of the globe than any other members of the entire order, as they not only inhabit the whole of the Eastern Hemisphere, but are particularly numerous in Australia and the Malay Islands. Unlike other Rasoires, the Quails are by no means social, but live strictly in pairs and rarely congregate into flocks, or associate freely with others of their kind, except during the migratory season, at which time they undertake journeys of considerable extent, their long wings enabling them to fly with far less effort or fatigue than do the *Perdices*. The incubation of this group is also somewhat peculiar, for wherever the means of subsistence are to be found, there they will breed as readily as in their native lands. As regards their general development, the Quails will bear comparison with any of their relations, and far exceed most of them in the rapidity and ease of their movements. In most respects the food of this group is the same as that consumed by other Rasoires, although, perhaps, they may be said to eat a less proportion of vegetable matter.

THE COMMON QUAIL.

The COMMON QUAIL (*Coturnix communis*) is brown, striped with reddish yellow on the upper parts of the body; the head is somewhat darker than the back, the throat reddish brown, and the region of the crop reddish yellow; a pale yellowish line passes from the base of the upper mandible over the eyes and down the sides of the neck across the throat, where it is bounded by two narrow dark brown lines. The blackish brown primary quills are spotted with reddish yellow in such a manner as to form stripes, the first quill has also a narrow yellow border; the reddish yellow tail-feathers have white shafts and are spotted with black at their edges. In the female all these colours are comparatively indistinct, and the reddish brown of the throat but little conspicuous. The eye is light brownish red, the beak horn-grey, and the foot either reddish or pale yellow. The length is seven inches and a half, and the breadth thirteen inches; the wing measures four inches and the tail one inch and three-quarters.

This species is found in most parts of the Old World. It arrives on the south coast of Europe and the islands of the Grecian Archipelago in immense flocks about April, and thence spread over Europe.

“The European Quails,” says Jerdon, “are found throughout India in considerable numbers during the cold weather, most migrating during the rains and breeding elsewhere, but a few pairs remaining and breeding in various parts of the country, especially towards the west and north-west. The Grey Quail, as it is termed in India, generally rises singly or in pairs, but considerable numbers are found together; and in some localities and in certain seasons it occurs in great profusion, and affords excellent sport to the gunner. It is found in long grass, corn-fields, stubble, and fields of pulse, wandering about, according as crops ripen in different parts of the country. It is less numerous towards the south of India than farther north.” In Great Britain it has been considered as a summer visitor; but, according to Yarrell, many instances have latterly been recorded of its occurrence in Ireland, as well as in England, during the winter months.

This Quail is likewise met with abundantly in Syria and Judæa, and there seems to be little doubt of its identity with the Quails so frequently mentioned in the Holy Scriptures. "We have," says Tristram, "a clear proof of the identity of the Common Quail with the Hebrew *selac*, in its Arabic name, *salwa*, from a root signifying 'to be fat'—very descriptive of the round, plump form and fat flesh of the Quail. The expression 'as it were two cubits high above the face of the earth' probably refers to the height at which the Quails fly above the ground. There are several expressions in the scriptural account which are borne out by observations of the habits of the Quail. At all times its flight is very low, just skimming the surface of the ground, and especially when fatigued it keeps close, never towering like the Partridge or Sand Grouse. It migrates in vast flocks, and regularly crosses the Arabian desert, flying for the most part at night, and when the birds settle they are so utterly exhausted that they may be captured in any numbers by the hand. Notwithstanding their migratory habits, they instinctively select the shortest sea passages, and avail themselves of any island as a halting-place. Thus in spring and autumn they are slaughtered in numbers on Malta and many of the Greek islands, very few being seen till the period of migration comes round. They also fly with the wind, never facing it like many other birds." "The Israelites 'spread them out' when they had taken them before they were sufficiently refreshed to escape; exactly as Herodotus tells us that the Egyptians were in the habit of doing with Quails—drying them in the sun."

Brehm mentions having been a witness to the arrival of a huge flock of Quails upon the coast of North Africa, and tells us that the weary birds fell at once to the ground completely exhausted by their toilsome journey, and remained there for some minutes as though stupefied. On recovering somewhat, they did not again take wing, but continued their journey apparently on foot. In Africa they occasionally take up their quarters in stubble-fields and cultivated districts, but principally frequent the vast steppes, and wander about singly from spot to spot. During the summer they prefer fruitful plains and the vicinity of corn-fields, carefully avoiding mountains or marshy localities. The popularity of these birds is in a great measure due to the pleasant sound of their clear, resounding cry, which during the breeding season enlivens the whole district in which they live. Upon the ground they move quickly but ungracefully, with tail hanging down and neck drawn in, each step being accompanied by a slight nod of the head. Their flight is very rapid, and occasionally changes to a beautiful hovering motion. Even towards its own species the Quail is extremely unsocial and frequently most pugnacious, displaying the latter quality not only towards its rivals, but to its mate, who is often very roughly treated. The females exhibit a somewhat more amiable disposition, and besides being careful of their own offspring, prove excellent foster-mothers to such young birds as have lost their parents. Whilst the sun is high the Quails remain concealed among the long grass and weeds, and about noon indulge in a sand-bath; the succeeding hours are also spent in a state of quiescence, but the sun has no sooner set, than they become brisk and fully alive to the necessity of going in search of food or picking a quarrel with some rival. At this time their agreeable call may be said to be almost incessant. Seeds, small portions of plants, but principally insects, constitute their usual diet, the process of digestion being assisted by the swallowing of small stones. They do not require much water, the dew affording them in most instances all the moisture they need; for this reason they are rarely met with at any drinking-place. Although insect nourishment is decidedly preferred by the Quail, it has been fed for months together simply on grain and wheat. It would appear that this bird is polygamous, and it is even stated on good authority that it will mate with birds of entirely different species. The nest, formed by the hen of small portions of plants and placed in a corn-field, is not commenced till the beginning of the summer months. The eggs, from eight to fourteen in number, are large and pear-shaped, with a glossy, light brown shell, very variously

marked with a deeper shade. The hen broods about twenty days, and testifies such devotion to her precious charge as often to sacrifice her life rather than quit the nest, while her mate goes forth with his companions into the neighbouring fields. The young grow rapidly and soon leave their parents' care, for by the time they are six weeks old they have attained their full size, and can fly well enough to join in the autumn migration. Immense numbers of Quails are annually captured on the shores of the Mediterranean, and the island of Capri so abounded in them that we are told some of its ancient bishops derived the principal part of their revenue from this source. Waterton assures us that no less than 17,000 of these delicate birds have been conveyed to Rome in one day.

The DWARF QUAILS (*Excalfactoria*), the smallest members of this family, represent a group



THE CHINESE QUAIL (*Excalfactoria Chinensis*).

distinguished from those already described by the rounded form of their wing, in which the third, fourth, and fifth quills are longer than the rest, the first being much shorter than the second; and the unusual difference observable in the plumage of the male and female. According to Latham, the scientific name given to these birds has arisen from a custom the Chinese have of using them to warm their hands upon during the winter. The various species inhabit India, the Malay Islands, and Australia.

THE CHINESE QUAIL.

The CHINESE QUAIL (*Excalfactoria Chinensis*) is a very beautiful bird, with the entire mantle of an olive-brown, each feather having a dark and light line on its shaft; the quills of the wing-covers are without these markings, though some few of the shoulder-feathers are striped with deep red. The brow, cheeks, breast, and sides are of a rich, deep grey; the throat is black above, and white, surrounded by a black line, beneath; the centre of the breast, the belly, lower tail-covers, and tail are of a beautiful brownish red. The coloration of the female is less varied in its tints; her chin is merely



Edw. C. Cassin's Book of Birds

LAGOPUS MUTUS

PTARMIGAN

(shown in half Nut.)

indicated by a small white patch, and the light brown breast is striped. The eye of both is dark brown, the beak black, and the foot bright yellow. The length of the male is five inches and a quarter, and the breadth nine inches: the tail measures but one inch. The female is not quite so large as her mate.

This beautiful little Quail is found all over China, the Malay Islands, and in many parts of India, but is rare in the latter country, except in Bengal and the neighbouring provinces.

"I have killed it," says Jerdon, "only once in the Carnatic. It occurs occasionally in Central India and in the Upper Provinces, as far as Bareilly, but it is rare in all these localities, and perhaps only stragglers find their way so far. In Lower Bengal it is tolerably abundant in low grassy meadows, the borders of indigo-fields, and in the grasses on road-sides; and in Purneah, in the month of July, it was the only Quail I observed."

This species breeds in July, the eggs being pale olive-green. When the young are full-grown they spread themselves all over the country, and this dispersion is greatly assisted and in many parts perhaps caused by the heavy inundations to which great part of the country in Bengal is annually subjected, generally in August and September. In the cold season they are replaced by the Grey Quail and the so-called Rain Quail.

These birds, according to Bernstein, live by preference in thick, extensive wilds, where they are easily hidden between high stalks of plants, but nevertheless visit the fields and pastures in the vicinity of dwellings. Their quiet and retired mode of life makes it difficult to observe their habits. They take wing unwillingly, and avoid danger rather by running or squeezing themselves through sheltering plants than by flight. Their note is gentle, beginning loud and gradually becoming softer, "du, du, du," or "du, du, hi." Their food consists of insects, worms, and a variety of seeds; Bernstein himself kept them on grasshoppers and various insects. He several times found their nest, which was in a little hollow of the ground, scraped by the mother, and in this she prepared her bed of dry grass, stalks, and roots. In none of these nests were there more than six eggs; these are of a greyish olive-green, or olive-brown, more or less thickly sprinkled with numerous olive-brown specks. Bernstein tells us that these birds retain their shyness when tamed, and often injure themselves by beating against their cage; but Swinhoe says that in Canton they are highly esteemed as cage-birds, and may be pretty regularly found in the markets there. Latham informs us that this species, as well as the Common Quail, is used by the Chinese to warm their hands in winter, as may be seen in many drawings and paper-hangings from China, and that many of these birds are made into pies as a delicacy for Europeans during their voyage home. They are caught in China as in Europe by means of a call-pipe.

The BUSH QUAILS (*Turnices*) are small birds with slender bodies, moderate-sized rounded wings, in which either the first quill is the longest, or the three first are of equal length. Their tail is composed of from ten to twelve narrow, weak feathers, and so small as to be almost entirely concealed beneath the upper and lower tail-covers; the medium-sized, straight, thin beak is high at its culmen and slightly arched towards its tip; the nostrils are situated at either side of the bill, and are partially covered with a small fold of skin; the delicate feet have long tarsi, and usually three or occasionally four toes.

The Bush Quails are spread over the whole of the Eastern Hemisphere, but are quite unknown in the western division of the globe. Australia would, however, appear to be their principal headquarters, for in that country, according to Gould, they are met with in every part that has as yet been explored, except in the neighbouring islands. Everywhere they select open plains, stony tracts covered with grass, or mountain sides, and in such situations lead a life so retired as to render their

capture a work of some difficulty, except during the breeding season. At that time both sexes lay aside their usual shy, quiet deportment, and exhibit the most fierce pugnacity towards all their companions. The strangest part of these encounters is that they are not confined to the males, as is usually the case, the females being fully as jealous and as violent as their mates, and, like them, constantly engage in such furious encounters as nearly to cost them their lives. Owing to this peculiar temperament these birds are trained by the Asiatics as fighting-cocks are in Europe. The nest is composed of grasses, and is placed in a hollow on the surface of the ground, under the shelter of a tussock of grass. The female usually lays four pear-shaped eggs.

THE BLACK-BREASTED BUSTARD QUAIL.

The BLACK-BREASTED BUSTARD QUAIL (*Turnix pugnax*), a well-known species of the above group, has the foot furnished with only three toes. The feathers on the mantle are of a dark brown tipped with crescent-shaped black and rust-red spots; the region of the eye, bridles, and cheeks are white, spotted with black; the wings are greyish brown, spotted with black and white; the quills are edged with white on the outer web; the throat is deep black, and the lower breast and belly bright rust-red; the rest of the plumage resembles that of the male. The eye is white, the beak light grey, and the foot dark yellow. This species is six inches long; the wing measures three inches, and the tail one inch. The female is considerably larger than her mate.

This interesting bird, which has long been a domestic favourite with the Hindoos and Malays, is very common in Java, where, as everywhere else, it frequents grassy patches in the forests and jungles, low bushy jungle, or fields of *dhal* and other thick crops near patches of brushwood; but it is rarely found in barren country, or in cultivated ground where there is no shelter. It feeds on various kinds of grain, small insects, and grasshoppers. The call of the female is a peculiar, loud, purring sound.

“The hen birds,” says Jerdon, “are most pugnacious, especially about the breeding season; and this propensity is made use of in the south of India to effect their capture. To this end a small cage with a decoy-bird is used, having a concealed spring compartment made to fall by the snapping of a thread placed between the bars of the cage. This is set on the ground in some thick cover, carefully protected. The decoy-bird begins her loud purring call, which can be heard a long way off, and any females within earshot rapidly run to the spot and commence fighting with the caged bird, striking at the bars. This soon breaks the thread, the spring-cover falls, at the same time ringing a small bell, by which the owner, who remains concealed near at hand, is warned of a capture, and at once runs up, secures his prey, and sets his cage again in another locality. In this way I have known twelve to twenty birds captured in one day in a patch of jungle in the Carnatic, where only I have seen this practice carried on. The birds that are caught in this way are all females, and in most cases are birds laying eggs at the time, for I have frequently known instances of some eight or ten of those captured so far advanced in egg-bearing as to lay their eggs in the bag in which they were carried before the bird-catcher had reached my house.”

The eggs, which are usually laid in a hollow in the ground, behind a bush, or sheltered by a stone, are from five to eight in number, of a dull stone-grey or green tint, thickly spotted and freckled with dusky yellowish brown; they are blunt in shape and very large in proportion to the bird. The affection of the male of this species for its offspring would appear to be by no means inferior to that of the mother; for we learn from Swinhoe that upon one occasion, having succeeded in capturing two young Bustard Quails that were almost fully fledged and placed them in a cage, he observed the female parent, as he supposed, clucking like a hen, as it ran and crept about the prisoners in a vain endeavour to lure them out of their strange abode. In order to secure a specimen the bird was shot,

and on examination proved to be a male. The Javanese rear this species on rice and small grasshoppers, and train both sexes to fight for their entertainment.

THE AFRICAN BUSH QUAIL.

The AFRICAN BUSH QUAIL (*Turnix Africanus*, or *T. Gibraltariensis*), one of the largest members of the group, is about six inches long; the sexes resemble each other in the coloration of their plumage, but the female is of much greater size, and fully one-third heavier than her mate. The dark brown head of the male is enlivened by three yellow streaks, and the back marked with irregular black and brown zigzag lines; the feathers of the wing-covers are yellow, with a black spot on the outer and a reddish yellow spot on the inner web; the throat is white, and the region of the crop reddish brown, each feather being edged with a lighter tint; the sides are reddish brown, with a few dark spots, and shade gradually into the pure white that covers the belly; the outer webs of the quills have light edges; the eye is yellow, the beak yellowish, and the foot lead-grey.

This species is found in many parts of Sicily and Spain, and stragglers are sometimes seen in the plains of Languedoc; it is met with also in the north of Africa, especially among the thickets and dwarf palms of Mount Atlas. Tristram informs us that a nest found in Algeria was most carefully concealed in thick bushes, and contained several eggs, slightly spotted, and of a purplish blue shade.

THE COLLARED PLAIN-WANDERER.

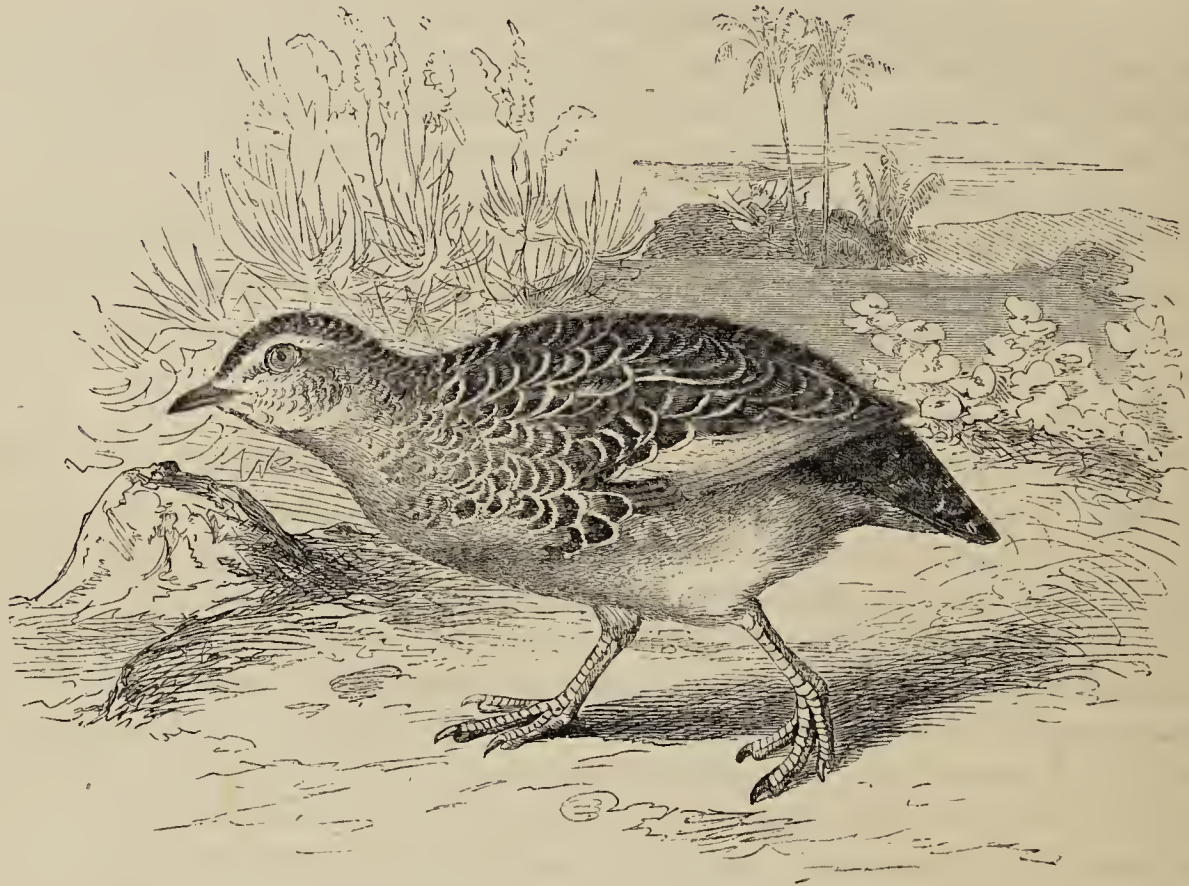
The COLLARED PLAIN-WANDERER (*Pedionomus torquatus*) has the foot furnished with four toes. The beak, which almost equals the head in length, is straight and compressed at its tip; the wings are short and shell-shaped, with the first, second, and third quills of equal size; the tail is short, the tarsus long, and the hinder toe placed high. In this species the top of the head is reddish brown, spotted with black; the brow and sides of the neck are light fawn-colour, dotted with black; the broad white band on the throat also shows black spots; the mantle-feathers are reddish brown, striped with black, and edged with reddish yellow; the middle breast is red, the rest of the under side fawn-colour, each of the feathers being marked like those on the back, whilst those at the sides exhibit broad irregular black spots; the tail-feathers are striped with blackish brown. The eye is straw-colour, the beak yellow, with black tip, and the foot greenish yellow. The male is four inches and a half long, and his wing three inches and a quarter, whilst his mate, who also surpasses him in the beauty of her markings, is not less than seven inches long; her wing measures three inches and a half, and the tail of both sexes one inch and a quarter.

“The structure of this singular little bird,” says Gould, “is peculiarly well adapted for inhabiting the arid and extensive plains that characterise the eastern portion of Australia. The lengthened and courser-like legs of the Collared Plain-Wanderer are admirably suited for running, while its short, round wings are as little fitted for extensive flight. Its general contour suggests the idea of a diminutive Bustard. On its native plains this bird has many singular habits, particularly that of secreting itself among the scanty herbage, or of remaining quiet on the bare ground until it is nearly trodden upon before it will rise, and when it does take wing its flight is more contracted than that of any other bird with which I am acquainted.” Sir George Grey states that these birds are migratory; appearing at Adelaide in June, and disappearing about January. While running about they are in the habit of raising themselves in a nearly perpendicular position on the extremities of their toes, so that the hinder part of the foot does not touch the ground, and of taking a wide survey around them.

“While in confinement,” says the same observer, “these birds eat pounded wheat, raw boiled rice, bread, and flies; the latter appear to be their favourite food. They soon become perfectly tame. The three in our possession we have had for upwards of four months. The call of those we have in

confinement precisely resembles that of the Emu—not the whistle, but the hollow-sounding noise, like that produced by tapping on a cask, which the Emu utters—but is, of course, much fainter.”

Gould received from Mr. Strange a fully-developed egg, taken from the ovarium of the female, which in general character resembled those of the *Turnices*. It was somewhat suddenly contracted at the smaller end. The ground-colour was stone-white, sprinkled with small blotches of umber-brown and vinous grey, the latter tint appearing as if beneath the surface of the shell, the sprinkled markings predominating at the larger end. The egg was one inch and one-eighth long, and seven-eighths of an inch broad.



THE AFRICAN BUSH QUAIL (*Turnix Africanus*, or *T. Gibraltariensis*).

The *Phasianidæ* of Brehm comprise not merely the PHEASANTS PROPER, but all nearly allied groups. The members of this important division generally possess a comparatively slender body, medium-sized or short and much rounded wings, and a long or broad tail, composed of from twelve to eighteen feathers. The moderately long bill is much vaulted, with its upper mandible curved over the lower part of the beak, and occasionally prolonged into a sharp, nail-like tip; the rather high foot is furnished with long toes, and in the male is armed with a spur; the partially bare head is sometimes adorned with combs and lappets of skin, and sometimes with horn-like appendages or tufts of feathers. The plumage is glossy and brilliantly coloured. This family is almost entirely confined to the Eastern Hemisphere, only two species being found in America; and even in the Old World their distribution is nearly completely restricted to the warmer part of the Asiatic continent and its dependent islands.

The TUFTED PHEASANTS (*Lophophori*) constitute a group distinguishable by their short, rounded tail, the feathers of which are not placed as in most other Pheasants, but present a fan-like arrangement.

THE MONAUL, OR IMPEYAN PHEASANT.

The MONAUL, or IMPEYAN PHEASANT (*Lophophorus resplendens, refulgens, or Impeyanus*), possesses a comparatively powerful body, moderate-sized wings, and a rather long tail, composed of sixteen feathers. The upper mandible is curved and sharply pointed at its tip; the foot is of medium height, that of the male furnished with a spur. The plumage of the male is magnificently coloured and very glossy; the region of the eye is bare, and his head decorated with a crest formed of numerous



THE MONAUL, OR IMPEYAN PHEASANT (*Lophophorus resplendens, refulgens, or Impeyanus*).

feathers; these are denuded of web at the roots and very broad at the extremities. The head and throat of this beautiful bird are of a metallic green, the crest is also of that hue, but resplendent with a golden sheen; the nape and upper part of the throat are of such a glossy purple or carmine-red that they gleam with all the brilliancy of the ruby; the lower parts of the throat and back are bronze-green, shaded with gold; the rest of the mantle, the wing and upper tail-covers are brilliant violet or blueish green; some few feathers on the under side are white, but its surface is principally black, shining with green and purple on the centre of the breast, and lustreless on the belly; the quills are black, the tail reddish brown; the eye is brown, the bare place that surrounds it blueish; the beak is dark grey, and the foot greyish green. The length is twenty-six and the breadth thirty-three inches;

the wing measures from eleven to eleven and a half inches, and the tail eight inches and a quarter. The female is white upon the throat, the rest of her plumage being pale yellowish brown, spotted, striped, and marked with dark brown. The primary quills are blackish, the secondaries and tail-feathers striped black and brownish yellow. The size of the female is inferior to that of her mate.

We have from the pen of "Mountaineer" a full account of the life of the Monaul, but we cannot help regretting that such an excellent observer should look upon this magnificent species with the eye of a sportsman rather than with that of a naturalist. "The Monaul is found on almost every hill of any elevation, from the first great ridge of the Himalayas above the plains to the limits of the wooded district, and in the interior it is the most numerous of the game-birds. When the hills near Mussooree were first visited by Europeans it was found to be common there, and a few may be still seen on the same ridge eastwards from Landour. In summer, when the rank vegetation which springs up in the forest renders it impossible to see many yards around, few are to be met with, except near the summits of the great ridges jutting from the snow, where in the morning and evening, when they come out to feed, they may be seen in the green glades of the forest and on the green slopes above. At that time no one would imagine they are half so numerous as they really are, but as the cold season approaches, and the rank grass and herbage decay, they begin to collect together. The wood seems full of them, and in some places hundreds may be put up in a day's work. In summer the greater number of males and some of the females ascend to near the limits of the forests, where the hills attain a great elevation, and may often be observed on the grassy slopes a considerable distance above. In autumn they resort to those parts of the forest where the ground is thickly-covered with decayed leaves, and descend lower and lower as winter sets in, and the ground becomes frozen or covered with snow. If the season be severe, and the ground covered to a great depth, they collect in the woods which face south or east, where the snow soon melts in the more exposed parts, or descend much lower down the hill, where it is not so deep, and thaws sufficiently to allow them to lay bare the earth under the bushes and sheltered places. Many, particularly females and young birds, resort to the neighbourhood of the villages situated up in the woods, and may often be seen in numbers in the fields. Still, in the severest weather, when fall after fall has covered the ground to a great depth, many remain in the higher forests during the whole winter; these are almost all males, and probably old birds. In spring all in the lower parts gradually ascend as the snow disappears.

"In the autumnal and winter months numbers are generally collected together in the same quarter of the forest, though often so widely scattered that each bird appears to be alone. Sometimes you may walk for a mile through the wood without seeing one, and suddenly come to some part where, within the compass of a few hundred yards, upwards of a score will get up in succession: at another time, or in another forest, they will be found dispersed over every part—one getting up here, another there, two or three farther on, and so on for miles. The females keep more together than the males; they also descend lower down the hills, and earlier, and more generally leave the sheltered woods for exposed parts, or the vicinity of the villages, on the approach of winter. Both sexes are found separately in considerable numbers. On the lower part or exposed side of the hill, scores of females and young birds may be met without a single old male; while higher up, or on the sheltered side, none but males are to be found. In summer they are more separated, but do not keep strictly in pairs, several being often found together. It may be questioned whether they do pair or not in places where they are at all numerous; if they do, it would appear that the union is dissolved as soon as the female begins to brood, for the male seems to pay no attention whatever to her whilst sitting, or to the young when hatched, and is seldom found with them.

"From April to the commencement of the cold season, the Monaul is rather wild and shy, but this soon gives way to the all-taming influence of winter's frosts and snows; and from October it becomes

gradually less so, till it may be said to be quite tame, but as it is often found in places nearly free from underwood, and never attempts to escape observation by concealing itself in the grass or bushes, it is perhaps sooner alarmed and at a greater distance than other Pheasants, and may therefore appear at times a little wild and timid. In spring it often rises a long way in front, and it is difficult to get near it when it again alights, if it does not at once fly too far to follow; but in winter it may often be approached within gunshot on the ground, and when flushed it generally alights on a tree at no great distance, and you may then walk quite close to it before it again takes wing.

“In the forest, when alarmed, it generally rises at once without calling or running far on the ground; but on the open glades, or grassy slopes, or any place where it comes only to feed, it will, if not hard pressed, run or walk slowly, in preference to getting up; and a distant bird, when alarmed by the rising of others, will occasionally begin and continue calling for some time while on the ground. It gets up with a loud fluttering and a rapid succession of shrill whistles, often continued till it alights, when it occasionally commences its ordinary loud and plaintive call, and continues it for some time. In winter, when one or two birds have been flushed, all within hearing soon become alarmed: if they are collected together, they get up in rapid succession; if distantly scattered, bird after bird slowly rises—the shrill call of each alarming others still farther off till all in the immediate neighbourhood have taken wing. When repeatedly disturbed by the sportsmen or *shikaries*, they often take a longer flight.

“In spring, when the snow has melted in every part of the forest, and they have little difficulty in procuring food, they appear careless about being driven from any particular spot, and often fly a long way; but in winter, when a sufficiency of food is not so easily obtained, they seem more intent on satisfying their hunger, and do not heed so much the appearance of man. The females seem at all times much tamer than the males. The latter have one peculiarity, not common in birds of this order; if intent on making a long flight, an old male, after flying a short way, will often cease flapping his wings, and soar along with a trembling, vibratory motion at a considerable height in the air. At such times, particularly if the sun be shining on his brilliant plumage, he appears to great advantage, and certainly looks one of the most magnificent of the Pheasant tribe.”

The call of the Monauls is a loud, plaintive whistle, which is often heard in the forest at daybreak or towards evening, and occasionally at all hours of the day. In severe weather, numbers may be heard calling in different quarters of the wood before they retire to roost. The call has rather a melancholy sound, or it may be that as the shades of a dreary winter's evening begin to close on the snow-covered hills around, the cold and cheerless aspect of nature with which it seems in unison make it appear so. In autumn the Monaul feeds chiefly on a grub or maggot which it finds under decayed leaves; at other times it subsists on roots, leaves, and the young shoots of various shrubs and grasses, or when obtainable, on acorns and other seeds and berries. In winter it often feeds in the wheat and barley fields, but does not touch the grain; roots and maggots seem to be its only inducement for digging amongst it. At all times and in all seasons it is very assiduous in the operation of digging, and continues at it for hours together. In the higher forests, where large open plots occur quite free from trees or underwood, early in the morning or towards evening these localities may often be seen dotted over with Monauls all busily engaged at their favourite occupation.

The Monaul roosts in the larger trees, but in summer, when near or above the limits of the forest, will often sleep on the ground in some steep rocky spot. The female makes her nest under a small overhanging bush or tuft of grass, and lays five eggs of a dull white, speckled with reddish brown; the chicks are hatched about the end of May. By some persons, according to “Mountaineer,” the flesh of the Monaul is thought equal to that of the Turkey, while others think

it scarcely eatable. In autumn and early winter the females and young birds afford excellent food, but from the commencement of spring they deteriorate in that respect. The same writer tells us that in autumn, when the leaves have fallen from the trees and an extensive view through the wood is allowed, he has frequently stood till twenty or thirty have got up and perched on the branches, and then he has walked up to the different trees and fired at them in succession without disturbing any but those which were quite close to the spot. The Monaul is easily kept in confinement, and in that condition has bred in England; it appears quite capable of enduring the severity of our winter.

LHUYS' PHEASANT.

LHUYS' PHEASANT (*Lophophorus Lhuysi*). This newly-discovered species, which has received the name of *Lophophorus Lhuysi* from Geoffrey St. Hilaire, in honour of the French minister of that name, differs from the Monaul chiefly in the ornamentation of its head and tail, the feathers of its crest being acuminate instead of spatulated, and its tail of a greenish bronze adorned with white spots.

This bird inhabits the northern slope of the Great Himalaya range, while the Impeyan Pheasant occupies the southern slope of the same mountains. The female of this species resembles the Hen Monaul.

The TRAGOPANS, or HORNED PHEASANTS (*Cerionis*), have a powerful body, moderate-sized wing, and short, broad tail composed of eighteen feathers. The bill is very short and rather weak, while the strong, flat foot is furnished with a spur. Two small, fleshy, horn-like appendages are situated behind the bare patch around the eye, and the naked skin on the throat is prolonged so as to form a pair of pendent lappets. The rich plumage of the male lengthens into a crest at the crown of the head, and is most beautiful both in its hues and markings, whilst that of the female is comparatively of sombre tint.

THE SIKKIM HORNED PHEASANT.

The SIKKIM HORNED PHEASANT (*Cerionis Satyra*) is of a bright carmine-red on the brow, crown of the head, nape, and shoulders; a broad band, that passes from the temples to the back of the head, and a narrow line around the lappet at the throat, are also of the same glowing hue; the upper back, breast, and belly are red, enlivened with white spots edged with black; the mantle and upper tail-covers are brown, but each feather is delicately striped with black, and has a black spot at its extremity; some of the feathers on the upper wing-covers are also dotted with red, the dark brown quills are bordered and streaked with dull yellow; the tail-feathers are black, striped with dark brownish yellow.

The eye is deep brown, and the foot yellowish brown; the fleshy appendages and lappets are blue, spotted here and there with orange-yellow. The male is twenty-seven inches long, the wing measures eleven inches and a half, and the tail eleven inches. The plumage of the female is principally brown, darkest on the back, and enlivened by numerous black and red spots and streaks, as well as by the white shafts and dots of the feathers. Her length is only twenty-four inches, and that of her tail ten inches.

This species, which was the first known to naturalists, inhabits the Nepaul and Sikkim Himalayas, being more abundant in the former. "I have," says Jerdon, "seen it in spring at an elevation of about 9,000 feet above the level of the sea; and in winter it descends to between 7,000 and 8,000 feet in the vicinity of Darjeeling, and perhaps lower in the interior. It is frequently snared by the Bhotees and other Hill-men, and brought alive for sale at Darjeeling. Its call, which I have heard in spring, is a

low, deep, bellowing cry, sounding like "waa-ung-waa-ung." Its general habits are no doubt similar to those of the *C. melanocephala*, which have been more accurately described."

THE JEWAR, OR WESTERN HORNED PHEASANT.

The JEWAR, or WESTERN HORNED PHEASANT (*Ceriornis melanocephala*), differs from the species last mentioned principally in the predominance of black in the coloration of the under side. In the male the feathers on the top of the head are black, with red tips; the nape, upper part of the throat, and shoulder are scarlet; the feathers on the mantle dark brown, ornamented with very delicate black



THE SIKKIM HORNED PHEASANT (*Ceriornis Satyra*).

lines and, towards their extremities, with small black-edged white spots. The feathers on the breast and belly are black, spotted with white, and slightly shaded with red; the quills are pale black, spotted and edged with brown; the tail is black, striped with brown and white at the ends of the feathers. The eye is nut-brown, the bare patch that surrounds it bright red, while the fleshy horns are pale blue; the lappets on the throat are purple, dotted with light blue at the sides, and bordered with flesh-pink; the beak is horn-grey, and the foot reddish. The male is from twenty-seven to twenty-eight inches long, and from thirty-five to thirty-six broad; the wing measures ten inches and a half; and the tail ten inches. The plumage of the female is varied with different shades of brown and black on the upper parts of the body, and with greyish brown, black, and white on the under side; the back is enlivened by pale yellow markings, and the under side by irregular white spots. The length of the female is twenty-three inches, the breadth thirty-one inches and a half; the wing measures nine inches and a half, and the tail eight inches and a half. (See Coloured Plate XXX.)

These birds are found from the western borders of Népaul to the extreme North-west Himalayas ; they are not very common near Simla and Mussooree, but are more plentiful near Almora.

“Their usual haunts,” says “Mountaineer,” “are high up, not far from the snows, in dense and gloomy forests, where they live either alone or in small scattered parties. In winter they descend the hills, and then their favourite haunts are in the thickest parts of the forests of oak, chestnut, and morenda pine, where the box-tree is abundant, and where under the forest trees a luxuriant growth of ‘ringalt’ or the hill bamboo forms an underwood in some places almost impenetrable. They keep in companies of from two or three to ten or a dozen or more, not in compact flocks, but scattered widely over a considerable space of forest, so that many at times get quite separated and are found alone.” Jerdon tells us, “that if undisturbed, they generally remain pretty close together, and appear to return year after year to the same spot, even though the ground be covered with snow, for they find their living then upon the trees. If driven away from the forest by an unusually severe storm or any other cause, they may be found at this season in small clumps of trees, wooded ravines, or patches of low brushwood.

“At this season, with the exception of its cry of alarm when disturbed, the Jewar is altogether mute, and is never heard of its own accord to utter a call or note of any kind ; unlike the rest of our Pheasants, all of which occasionally crow or call at all seasons. When alarmed it utters a succession of wailing cries, not unlike those of a lamb or kid, like the syllables ‘waa, waa, waa,’ each syllable uttered slowly and distinctly at first, and more rapidly as the bird is hard pressed and about to take wing. Where not repeatedly disturbed, it is not particularly shy, and seldom takes alarm till a person is in its immediate vicinity, when it creeps slowly through the underwood, or flies up into a tree, in the former case continuing its call till again stationary, and in the latter till it has concealed itself among the branches. If several are together all begin to call at once, and run off in different directions, some mounting into the trees, others running along the ground. When first put up they often alight in one of the nearest trees ; but if again flushed the second flight is generally to some distance, and almost always down-hill. Their flight is rapid, and the whirr produced by the wings peculiar, so that even when the bird is not seen it may be distinguished from any other species. Where their haunts are often visited, either by the sportsmen or the villagers, they are more wary, and if such visits are of regular occurrence and continued for any length of time, they become alert in a very high degree ; so much so that it is impossible to conceive a forest bird more shy or cunning. They then, as soon as aware of the presence of any one in the forest, after calling once or twice, or without doing so at all, fly up into the trees, which near their haunts are almost always evergreens of the densest foliage, and conceal themselves so artfully among the tangled leaves and branches that unless one has been seen to fly into a particular tree, and it has been well marked down, it is almost impossible to find them. In spring, as the snow begins to melt on the higher parts of the hills, they entirely leave their winter resorts, and gradually separate and spread themselves through the more remote and distant woods, up to the region of birch and white rhododendron, and almost to the extreme limits of forest. Early in April they begin to pair, and the males are then more generally met with than at any other period ; they seem to wander about a great deal, are almost always found alone, and often call, at intervals, all day long. When thus calling, the bird is generally perched on the thick branch of a tree, or the trunk of one which has fallen to the ground, or on a large stone ; the call is similar to the one they utter when disturbed, but it is much louder and only one single note at a time—a loud energetic ‘waa,’ not unlike the bleating of a lost goat—and can be heard for upwards of a mile. It is uttered at various intervals, sometimes every five or ten minutes for hours together, and sometimes not more than two or three times during the day ; its purport most probably is to invite the females to the place. When the business of incubation is over, the broods, with the

parent birds, keep collected together about one spot and descend towards their winter resorts as the season advances ; but the forests are so densely crowded with long weeds and grass that they are seldom seen till about November, when these have partially decayed, so as to admit of a view through the wood."

The Jewar feeds chiefly on the leaves of trees and shrubs : of the former the box and oak are the principal ones ; of the latter, *thugall* and a shrub something like privet. It also eats roots, flowers, grubs, insects, acorns, seeds, and berries of various kinds, but in small proportion as compared with leaves ; in captivity it will eat almost any kind of grain. Though the most solitary of our Pheasants, and in its native forests perhaps the shyest, it is the most easily reconciled to confinement ; even when caught old it soon loses its timidity, eating readily out of the hand, and little difficulty is experienced in rearing it.

"The Jewar," says Jerdon, "roosts in the trees ; and in winter, perhaps for warmth, seems to prefer the low evergreens, with closely interwoven leaves and branches, to the larger trees which overshadow them."

We are without particulars respecting the incubation of this species.

The JUNGLE FOWLS (*Galli*) have a powerful body, short wings, and a moderate-sized graduated tail, consisting of fourteen feathers, placed vertically one above another. The beak is strong, of medium length, arched at its culmen, and curved at the tip of the upper mandible ; the high foot is armed with a spur ; a fleshy comb rises at the top of the head, and from the lower part of the beak depend soft fleshy wattles ; the region of the cheek is bare. The thick, variegated plumage is so prolonged on the upper tail-covers as to conceal the real tail, over which the flowing feathers fall in graceful sickle-shaped curves. India and the Malay Islands seem to be the native abodes of these birds, each species, however, having its peculiar habitat. All the members of the group lead a retired life within the recesses of woods and forests, and for this reason we are but little acquainted with any minute details concerning the habits of many species.

THE KASINTU, OR RED JUNGLE FOWL.

The KASINTU, OR RED JUNGLE FOWL (*Gallus Bankiva*), is a most gorgeous bird, having its head, throat, and the flowing feathers on the nape of glossy golden yellow, those on the back are purplish brown, with bright orange-red centre, and yellowish brown edges ; the long feathers of the upper tail-covers are golden yellow, those of the middle wing-covers chestnut-brown, shaded with blackish green ; the breast-feathers are black, with a golden green lustre ; the dark, blackish grey primaries have light borders, the secondaries are rust-red on the outer and black on the inner web ; the black tail is glossy at its centre and quite lustreless at its sides. The eye is orange-red, the comb red, the back brownish, and the foot slate-grey. This species is twenty-five inches long ; the wing measures eight inches and a half and the tail fourteen inches. The female is smaller than her mate, and carries her tail lower, and in her the comb and fleshy wattles are only indicated. The long neck-feathers are black, edged with whitish yellow, and those of the mantle dotted with brownish black ; the under portions of the body are creamy yellow, and the quills and tail brownish black. This beautiful and well-known species, which is generally supposed to be the original stock of our domestic poultry, closely resembles some of the British Dunghill Cocks in plumage, but is considerably less in size. This bird appears to have been domesticated in the East at a very early date, and must have been introduced into Europe in very ancient times. It was well known to the Greeks and Romans, who, like our own people at a very recent period, and many Eastern nations at the present day, delighted in the cruel spectacle of a cock-fight. The Red Jungle Fowl is found from the Himalayas south-

wards, on the western side of India, at any rate as far as the Vindhyan range. On the east it extends through Central India and the Northern Circars, almost to the northern branch of the Godavery. In Central India this fowl is rare, especially towards the west, but it is abundant towards the east, particularly in the Northern Circars. It is found in the Raimahal Hills, as far as the southern bank of the Ganges; but is seldom seen in the range of hills south of Cashmere, and from thence across the Himalayas to Assam, Silhet, Chittagong, and Burmah.

The Jungle Fowls are partial to bamboo jungle, but also inhabit lofty forests and dense thickets. "In travelling through a forest country," says Jerdon, "many are always found near the roads, to which they resort to pick up the grain from the droppings of cattle, &c.; dogs often put them up, when they at once fly on to the nearest trees. When cultivated land is near their haunts they may be seen morning and evening in the fields, often in straggling parties of from ten to twenty."

The breeding season is from January to July, according to the locality. Their eggs, eight in number, are creamy white, and are often laid in a dense thicket, or under a bamboo clump, the hen occasionally scraping together a few leaves or dried grass to form a nest. After the end of the period of incubation, the hackles fall off the neck of the male, and are replaced by short blackish grey feathers.

Jerdon tells us that young birds, if kept for a few days, are very excellent for the table, having a considerable game flavour.

THE JUNGLE FOWL OF CEYLON.

The JUNGLE FOWL OF CEYLON (*Gallus Stanleyii*). The male of this beautiful bird resembles that of the species last described in its general appearance, but has the breast reddish brown, striped with deep black, moreover, the wing-feathers have no brown patch in their centre. The female closely resembles that of the *Gallus Bankiva*. "This fowl," says Tennant, "abounds in all the lower parts of the island of Ceylon, but chiefly in the lower range of mountains; and one of the most vivid memorials associated with my journey through the hills, is its loud, clear cry, which sounds like a person calling 'George Joyce.' At early morning it rises amidst mist and dew, giving life to the scenery that has scarcely yet been touched by the sunlight." This species has never as yet been bred or survived in captivity, and no living specimens have been successfully transmitted to Europe.

THE JAVANESE JUNGLE FOWL.

The JAVANESE JUNGLE FOWL (*Gallus furcatus*) is even more gorgeously plumed than those of its family already described. The long blunt feathers on the neck are of a deep metallic green, with a narrow border of velvety black; the long narrow feathers on the upper wing-covers are blackish green, with bright golden green edges; the long rump-feathers are blackish green in the centre, bordered with light yellow; and all the feathers of the tail-covers are of a deep and glossy black. The primary quills are blackish brown; the secondaries brown, with a narrow, reddish yellow edge to the outer web; while the real tail-feathers are of a rich glossy metallic green. The eye is light yellow; the bare face red at its sides, and marked with King's yellow beneath; the lower part of the comb is blue, and its apex violet; the beak is greyish black, with greyish yellow at its base; the foot is light-blueish grey.

The female is considerably smaller than her mate, has her face covered with feathers, and is entirely without either comb or lappets on the throat. Her head and throat are greyish brown, the feathers on the mantle golden green, with greyish brown edges, and delicate golden streaks on the shafts. The secondary quills and large wing-covers are glossy dark grey, marked with yellow; the primaries are greyish brown; the tail-feathers brown, shaded with green, and edged with black. The under side is greyish cream-colour, and the throat white. This beautiful species is a native of Java.

THE SONNERAT JUNGLE FOWL, OR KATAKOLI.

The SONNERAT JUNGLE FOWL, or KATAKOLI (*Gallus Sonnerati*), differs from all its congeners in the construction of its neck-feathers, which are long, slender, and rounded at their extremities, where the shaft spreads out in such a manner as to form a round horny disc; it then again contracts, and again expands into a second disc. The webs of these feathers are dark grey; the shafts and lower discs pure white, and those at the end bright reddish yellow; the long slender feathers on the mantle are brownish black with light spots, and those of the smaller wing-covers have a webless smooth shaft of a glossy reddish brown; the wing-feathers are grey, with light shafts and edges, those at the exterior bordered and shafted with red and yellow. Some of the quills are dull grey, with light edges and shafts, the rest black, with a greenish lustre; the sickle-shaped feathers of the upper tail-covers gleam with dark green, those on the under side are blackish grey, such as cover the thighs having a reddish or yellow tint at the centre and edges. The eye is light brownish yellow, the comb red, and the beak yellowish grey. This species is twenty-four inches long; the wing measures nine inches and a half, and the tail about fifteen inches. The hen is almost of a uniform dark brown on the mantle, the edges to the feathers being of so pale a tint as merely to give the effect of light shading; the throat and gullet are white, the rest of the under side light yellowish grey, bordered with black; the primary quills are dark brown; the secondaries striped black and brown; the tail-feathers blackish brown, spotted and marked with a still deeper tint.

The Sonnerat Jungle Fowl, or Grey Jungle Fowl, as it is also sometimes called, is found only in Southern India, spreading on the eastern coast to a little north of the Godavery, in Central India to the Pachmari, and on the west to the Jajpeele hills. It is found in great abundance on the Malabar coast, especially in the most elevated portions, and ascends to the summit of the Neilgherry Hills. It is also found in the Eastern Ghauts, and in various isolated ranges in different parts of Southern India.

“Like the Red Jungle Fowl,” says Jerdon, “it affects bamboo jungles. Early in the morning, throughout the Malabar coast, the bird may be found feeding on the roads; and with dogs you are certain of getting several shots, the birds perching at once on being put up by dogs. The hen lays from February till May, generally producing from seven to ten eggs of a pinky cream-colour. These are usually deposited under a bamboo clump. The call of the Cock is very peculiar, being a broken and imperfect kind of crow, quite unlike that of the Red Jungle Fowl, and quite impossible to describe. When they are taken from the jungles they are also very much wilder, and not so easily domesticated as that species; but cases are known in which they have bred in confinement with hens of the common breed.”

The section *Phasianus* of Brehm constitutes a numerous subdivision of the *Phasianidæ*, generally recognisable by the elongate body, short neck, and small head; the short, much-rounded wing has the fifth and sixth quills longer than the rest; the tail (composed of from sixteen to eighteen feathers, placed in lengths) is wedge-shaped, and either very long or of moderate size; the slender bill is weak, much arched and hooked at its extremity; the foot is of medium height, smooth and powerful—that of the male is furnished with a spur. The plumage, which covers the entire body except the cheeks and tarsi, is prolonged upon the head, and sometimes on the nape into a crest and flowing collar; the brilliancy of its coloration is, to a certain degree, inferior to that of the *Phasianidæ*, which we have before described, but it is, nevertheless, striking and beautiful. The female is smaller than her mate, owing to the unusual shortness of her tail; she also differs in the fact that her plumage is sombre and but little variegated.

All the various members of this group were originally natives of Asia, where some species frequent mountain ranges, and never descend from a certain altitude even during the most severe winters, whilst others prefer low-lying districts; they, however, avoid the actual forest, and seek for the shelter of brushwood, shrubs, or hedges, and from thence fly out to search for food in the surrounding country. These birds are stationary in their habits, and at most indulge in short expeditions not exceeding the distance of a few miles from their native haunts.

The MACARTNEY PHEASANTS (*Euplocamus*) constitute a group possessing a slender body, short neck, small head, short wing, and moderate-sized tail, composed of sixteen feathers. The bill is moderate, the tarsus high, and in the male armed with a spur. The feathers on the neck and rump are not much prolonged, and the former are more or less ragged at their tips; those of the tail are placed in gradations, the centre ones curving both downwards and outwards. The head is decorated with a delicate crest; the cheeks are bare, and covered with a soft velvety skin, which swells to such a size during the period of incubation as to form a comb and short lappets. The plumage of these birds is more remarkable for its brilliant lustre than for the variety of its hues. The female and young differ considerably from the adult male in their appearance.

THE SIAMESE FIREBACK.

The SIAMESE FIREBACK (*Euplocamus-Diardigallus-prælatus*) is a fine species, with the throat and upper part of the breast and back of a beautiful dark grey; the crown of the head and a narrow band around the bare red cheek are black; the feathers on the centre of the back are bright yellow; those on the rump black, with a broad scarlet edge. The wing-feathers are grey, bordered and marked with a darker shade; those of the tail are lustrous blackish green, and those on the breast deep black, with a green gloss; the crest is composed of from twelve to twenty feathers, having lancet-shaped tips and bare shafts towards their roots.

This bird is a native of Siam, where it is known as the "Kai-pha." Sir Robert Schomburghk saw a living specimen in a collection of animals at a Siamese temple, and purchased it. When in captivity, instead of seeds, it had been fed upon the fry of fishes, prawns, and shrimps; this specimen, when dead, was forwarded to Mr. Gould. Sir Robert Schomburghk was afterwards told by the Prime Minister, or Kalakome, that this pheasant is found at Rapri, or Raxaburi according to Sir J. Bowring's map, in latitude $31^{\circ} 33'$ north; longitude say 100° east.

Mr. Gould, previously to the receipt of this specimen, had seen a drawing of the bird in the East India Company's collection.

Schomburghk describes some of these birds kept by himself as being readily tamed; their flight resembled that of a Partridge, and their cry, when alarmed, was loud and harsh. Their food consisted of insects, rice in the husk, small bits of plants, bananas, and various other kinds of fruit; the latter diet they evidently preferred.

THE SIKKIM KALEEGE, OR BLACK PHEASANT.

The SIKKIM KALEEGE, BLACK PHEASANT, or KIRRIK (*Euplocamus-Gallophasis-melanotus*), as it is called in India, has the entire mantle of a glossy black, a part of the throat and the breast are whitish, the belly and feathers on the tail-covers dull brownish black. The eye is brown, the beak greyish yellow, the bare cheek bright red, and the foot grey. The length of this bird is twenty-three and the breadth twenty-eight inches; the wing measures eight inches and three-quarters, and the tail ten inches. The female is somewhat smaller, and is principally of an umber-brown, each feather having a light tip and lines on the shaft; these markings are broader and lighter on the under side

and upper wing-covers than on the back; the throat-feathers are light grey, unspotted; and the centre tail-feathers deep brown, marked with light grey; those at the sides are greyish, with a green gloss.

Jerdon tells us the Sikkim Black Pheasant is met with in Nepaul, in some portions of the country being replaced by *Gallophasis Horsfieldii*. He informs us that about Darjeeling it is the only Pheasant at all common, and is not unfrequently put up on the roadside by dogs, when it at once takes refuge in trees. It is found at an altitude of from 3,000 to nearly 8,000 feet. It walks and runs with its tail semi-erect, and frequents both forests and bushy and grassy ground, coming to the fields and to more open spaces to feed in the morning and evening. Its eggs are occasionally found by the coolies, when weeding the tea-gardens in June and July, and are usually from five to eight in number. Its call sounds something like "koorchi-koorchi," at other times it resembles "kooruk-kooruk."

THE KELITSCH, OR WHITE-CRESTED KALEEGE PHEASANT.

The KELITSCH, OR WHITE-CRESTED KALEEGE PHEASANT (*Gallophasis albocristatus*), has the head, throat, mantle, and tail of a lustrous blueish black; the rump-feathers are dull white, marked with pale black; the crest is white; the long breast-feathers greyish white; and the rest of the under side dark grey. The eye is brown, the bare cheek red, the beak dark grey, and the foot blueish grey. The hen bird is scarcely distinguishable from the female Kirrik.

Of the life and habits of these birds we know but little, except from the writings of "Mountaineer," who has, however, observed and described them with his usual exactness. "The well-known Kaleege," says he, "is most abundant in the lower regions; it is common in the Dhoon at the foot of the hills, in all the lower valleys, and everywhere to an elevation of about 8,000 feet. From this it becomes scarcer, though a few are found still higher. It appears to be more unsuspecting of man than the rest of our Pheasants; it comes much closer to his habitations, and from being so often found near the villages and roadsides, is regarded by all as the most common, though in their respective districts the Monauls are more numerous. In the lower regions it is found in every description of forest from the foot to the summit of the hills, but is most partial to low coppice and jungle, and wooded ravines or hollows. In the interior it frequents the scattered jungle at the borders of the dense forest, thickets near old deserted patches of cultivation, old cow-sheds and the like, coppices near the villages and roads, and, in fact, forest and jungle of every kind except the distant and remote woods, in which it is seldom found. The presence of man, or some trace that he has once been a dweller in the spot, seems as it were necessary to its existence.

"The Kaleege is not very gregarious; three or four are often found together, and ten or twelve may sometimes be put out of one small coppice, but they seem in a great measure independent of each other, much like our English Pheasants. When disturbed, if feeding or on the move, they generally run, and do not often get up unless surprised suddenly and closely, or forced by dogs, or else they lie rather close in thick cover. They are never very shy, and where not unceasingly annoyed by sportsmen or *shikarees* are as tame as could be wished. In walking up a ravine or hill-side, if put up by dogs a little distance above, they will often fly into the trees close above one's head, and two or three will allow themselves to be quietly knocked over in succession. When flushed from any place where they have sheltered, whether on the ground or aloft, they fly off to some distant cover, and alight on the ground in preference to the tree. Their call is a loud whistling chuckle or chirrup; it may be occasionally heard from the midst of some thicket or coppice at any hour of the day, but is not of frequent occurrence. It is generally uttered when the bird rises, and if it flies into a neighbouring tree is often continued for some time. When flushed by a cat or some small animal, this chuckling is always loud and earnest.

“The Kaleege is very pugnacious, and the males have frequent battles. On one occasion I had shot a male, which lay fluttering on the ground in its death-struggles, when another rushed out of the jungle and attacked it with the greatest fury, though I was standing reloading the gun close by. The male often makes a singular drumming noise with its wings, not unlike the sound produced by shaking a stiff piece of cloth. It is heard only in the pairing season, but whether it is employed to attract the female, or in defiance of his fellows, I cannot say, as I have never seen the birds in the act, though often led to the spot where they were by the sound. It feeds on roots, grubs, insects, seeds, and berries, and the leaves and shoots of shrubs. It is rather difficult to rear in confinement when



THE KALEEGE, OR BLACK PHEASANT (*Euplocamus-Gallophasis-melanotus*).

caught old, and the few chicks I have tried have also soon died, though possibly from want of attention. The Kaleege lays from nine to fourteen eggs—very similar in size to those of the Domestic Hen. They are hatched about the end of May.”

Birds of this species resident in the Zoological Gardens in London have repeatedly bred there.

THE SILVER PHEASANT.

The SILVER PHEASANT (*Nycthemerus argentatus*, or *Euplocamus nycthemerus*) differs from the preceding, which in other respects it closely resembles, in the long ragged crest on its head, and the wedge-like form of its tail. The feathers of the latter are placed in heights, those in the centre curving rather towards the sides than downwards. This magnificent bird is white on the nape and mantle, the feathers of the latter being traced with delicate zigzag black lines. The black under side has a steel-blue lustre, the quills are white, edged and streaked with black; the tail-feathers are

similarly coloured, their markings becoming gradually broader towards the tips. The long thick crest is glossy black, the bare cheek scarlet, the eye light brown, the beak blueish white, and the foot coral-red. This species is thirty-two inches long.

From the date of its first introduction into Europe the Silver Pheasant has been everywhere regarded as more fitted to be an ornament of our aviaries than a denizen of our woods, and, when so treated, has rewarded us for our pains. It may, indeed, be said to be completely naturalised in a



THE SILVER PHEASANT
(*Nycthemerus argentatus*, or *Euplocamus nycthemerus*).

domesticated state, and it could doubtless be established in our woods, were such a measure desirable; but to effect this with success no other species of Pheasants must be kept within its precincts, the pugnacious nature of this tribe of birds not admitting of the near proximity of two species, as the certain result would be a constant succession of battles, almost invariably ending, as is known to be the case when the Domestic Cock and Pheasant meet, in the death of the weaker bird.

Our country is not, perhaps, after all, well adapted either for this bird or its near allies, the *Euplocami*, which have been only recently introduced. The Silver Pheasant has been found to bear confinement well, and with but ordinary care its propagation is usually attended with success. After the autumn moult, its pencilled markings are exceedingly elegant and graceful; as spring advances its rich comb and wattle become enlarged, and of a most vivid scarlet, offering a striking contrast to its delicate pea-green bill. The colouring of the female is altogether sombre, and devoid of that sparkling brilliancy which so eminently adorns her mate, making him conspicuous even among the gayest of his congeners.

The PHEASANTS PROPER (*Phasiani*) are recognisable by their long tail, the feathers of which are placed vertically, those in the centre being six or eight times as long as those at the sides, while those of the upper tail-covers have ragged or rounded tips. Their head is without a crest, but has a small upright tuft of feathers close to each ear. The plumage of the male is always beautiful, often most brilliant; but that of the female is comparatively sombre, with dark markings. The native countries of these birds are the mountainous parts of Asia, extending even to Japan; some species, however, have become naturalised in the temperate part of Europe. During the day they are found lying concealed in jungles, covers, and long grass, living in divided societies, of different sex. Towards the spring they separate into families, consisting of a male and several females; the party generally taking possession of a certain locality, from which the commander is very particular in driving away all male intruders. When suddenly disturbed, they endeavour to escape by using their legs rather than their wings. Their flight is rapid and noisy when first started, but is sustained only for a short distance. Various kinds of grain and insects form their principal food; these are usually sought for at sunset. They also consume bulbous roots, which are obtained by means of their bill and feet. Their eggs are deposited on long grass, without any kind of nest, and are about ten in number.

THE COMMON PHEASANT.

The COMMON PHEASANT (*Phasianus Colchicus*) is so variegated as to render an accurate description of its plumage extremely difficult. The head, as well as part of the neck, is green, with a resplendent blue gloss; the lower part of the neck, breast, belly, and sides are reddish brown, glistening with purple, each feather on these parts being edged with glossy black. The feathers on the mantle have white crescent-shaped spots below the border. The flowing, ragged feathers on the rump are dark copper-red, shaded with purple; the quills striped brown and reddish yellow; and the tail-feathers olive-grey, striped with black, and bordered with reddish brown. The eye is reddish yellow, the bare regions round the eye red, the beak light brownish yellow, and the foot reddish grey or lead-colour. This species is from thirty to thirty-two inches long, and from twenty-nine to thirty-one broad; the wing measures nine inches and a half, and the tail sixteen inches. The female is of inferior size, and has the entire plumage of a brownish grey tint, spotted and striped with black and deep reddish brown; the feathers on her back are darker than the rest of the body. The *Banded* and *Isabel Pheasants* closely resemble the above bird in their general appearance: but the first is distinguishable therefrom by a narrow white band on the throat, the deeper shade of its colouring, and the comparative paleness of its black markings; whilst the *Isabel Pheasant* is principally of a light yellowish grey, each feather edged with a deeper shade, the belly, on the contrary, is very dark, sometimes quite black. The females of both these last-mentioned varieties are similar to their mates in the principal hues of their plumage.

The Common Pheasant, which is now naturalised all over the European continent, was originally introduced from Colchis, and derived its name from the river Phasis, in the neighbourhood of which it was especially abundant. In its native country, now called Mingrelia, it is still to be found wild, and of unequalled beauty. This bird, which is spread extensively over England, as far north as Northumberland, prefers woods, especially those of oak or beech, and such as have a growth of long grass and brambles, also damp ground where osiers and reeds abound, and hedgerows, but always lives in the vicinity of wood and water. During the day these Pheasants remain on the ground, moving quietly from bush to bush, as they go in search of food at dawn and sunset. In their progress to their feeding-place they always run, and on this account are very easily taken by wire snares set in the narrow paths that they make in the long grass which they constantly frequent. Towards evening they go to roost on low branches, taking their place near the stem or trunk of the tree.

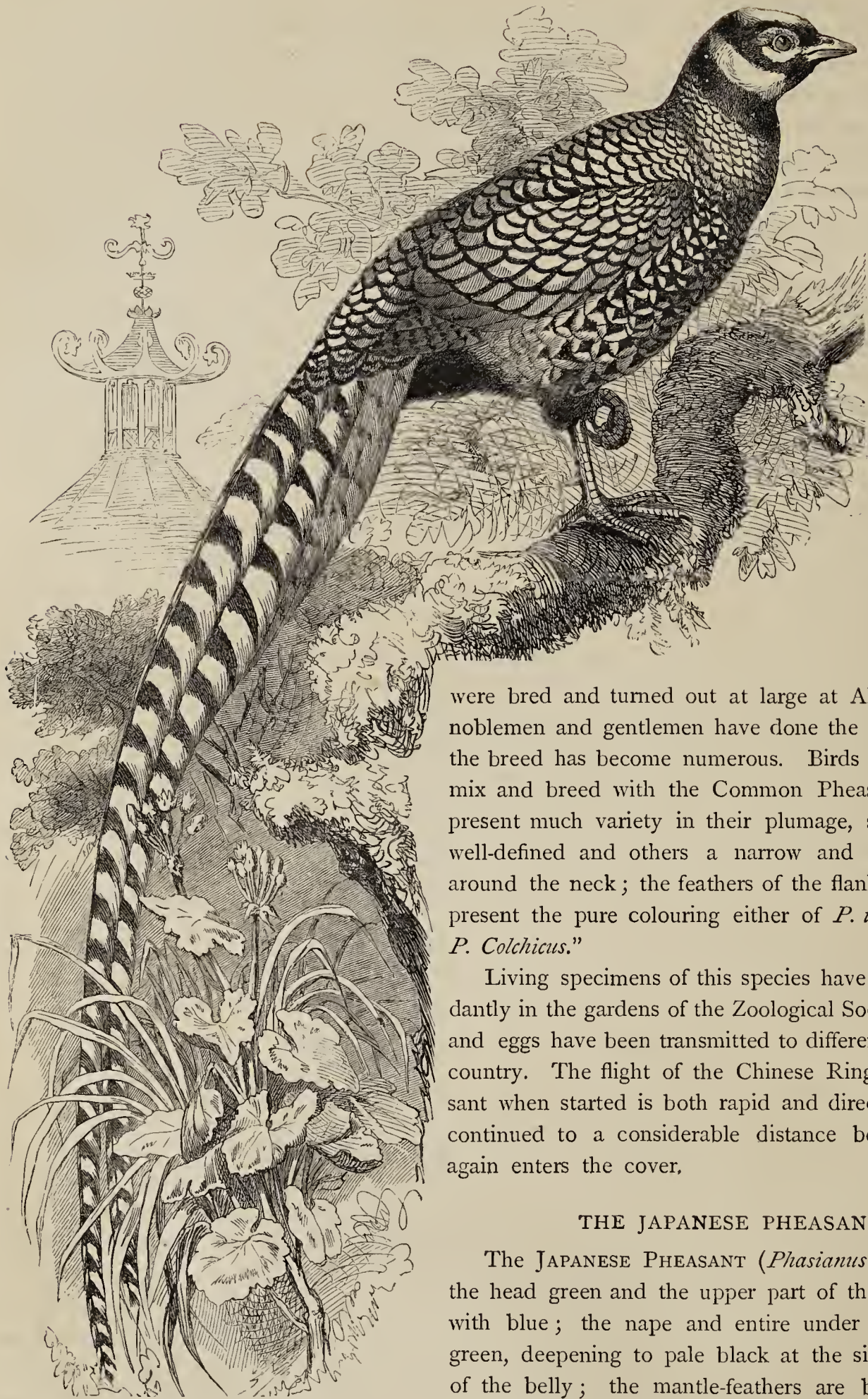
This habit of roosting upon trees is very fatal to their safety, since, being objects of considerable size, readily distinguishable by their long tails, and not easily frightened from the perch, they offer a sure mark during moonlight nights to the poacher's gun. The roosting-place of the male is very easily discovered, for he invariably chuckles when he first "trees," or goes to perch; and the female usually chirps on the same occasion. During summer and the period of moulting the Pheasant rarely perches, but retires for the night to the longest grass or other thick cover, and does not begin to "mount" again until towards the end of September or the beginning of October, having at that time renewed its plumage. Where Pheasants are numerous, the males are generally found associated during the winter separate from the females; and it is not until the end of March that they allow the approach of the latter without signs of displeasure, or at least indifference. At the above-mentioned time, however, the male bird assumes an altered appearance; the scarlet on his cheeks and around his eyes acquires additional depth of colour, and he walks with a more measured step, with his wing let down, and his tail carried in a more erect position. Being polygamous, he now takes possession of a certain "beat," from whence he drives every male intruder, and commences his crowing, which is accompanied by a peculiar clapping of his wings as a note of invitation to the other sex, as well as of defiance to his own. The female makes a very inartificial nest upon the ground, in long grass or thick underwood, and not unfrequently in fields of clover; she lays from ten to fourteen eggs, of a clear yellowish grey-green colour. The young are hatched during the months of June and July, and continue with the hen until they begin to moult and assume the adult plumage; after this period the young males are only to be distinguished from the older birds by the comparative bluntness and shortness of the tarsal spur. Usually when alarmed the Pheasant escapes by running rapidly, and seldom uses its wings, except in cases of very pressing danger.

"An old cock Pheasant," says Mr. Yarrell, "immediately on hearing a dog give tongue in a wood where he is, will foot away to the farthest corner, particularly if the wood be open at bottom, and from thence run one dry ditch or hedgerow after another for half a mile to the next covert; but a hen Pheasant seems to trust to her brown colour to escape detection, and, squatting in any bit of long grass that is near her, often surprises and startles the young shooter not a little by bouncing up with a rattling noise close at his feet. The poor frightened bird is frequently indebted to the sensation thus created for a clear escape. The brown earth-like colour of the plumage of the females of several species of Pheasants seems to be an admirable provision, not only for their individual safety, but for the preservation of the whole race."

In a wild state, the Pheasant feeds on grain, seeds, green leaves, and insects; also on some kinds of bulbs and berries.

THE CHINESE RING-NECKED PHEASANT.

The CHINESE RING-NECKED PHEASANT (*Phasianus torquatus*) is even more beautiful than its congeners. In this elegant bird the head and part of the throat are green; a line over the eyes and a collar about the throat white; the feathers on the nape almost black near the shaft, with broad yellow borders; and those on the mantle black at the base, with alternate yellow and black streaks, each feather edged with bright red. The long feathers on the rump and upper wing-covers are greenish grey, marked and dotted with red; those on the belly purplish brown, with conical black spots on the shafts, and those on the sides brownish yellow, marked with large round dark spots on the shafts. The quills are greyish brown, striped with greyish yellow, and secondaries reddish grey; the tail-feathers are greenish yellow, streaked with black. The eye is yellowish, the wattle on the cheek red, the beak light grey, and the foot brownish yellow. The size of this species is about that of the Common Pheasant. The hen resembles the female of the latter in her general appearance, but is somewhat



REEVES' PHEASANT
(*Phasianus Reevesii*, or *P. veneratus*).

redder. China is the native land of this beautiful species, which is there very abundant in wood-covered tracts.

"These birds," says Latham, "were first introduced into England under the name of Barbary Pheasants, by the Duke of Northumberland, and many

were bred and turned out at large at Alnwick. Other noblemen and gentlemen have done the same, and thus the breed has become numerous. Birds of this species mix and breed with the Common Pheasant, and thus present much variety in their plumage, some having a well-defined and others a narrow and imperfect ring around the neck; the feathers of the flank, also, do not present the pure colouring either of *P. torquatus* or of *P. Colchicus*."

Living specimens of this species have bred so abundantly in the gardens of the Zoological Society that birds and eggs have been transmitted to different parts of the country. The flight of the Chinese Ring-necked Pheasant when started is both rapid and direct, and is often continued to a considerable distance before the bird again enters the cover.

THE JAPANESE PHEASANT.

The JAPANESE PHEASANT (*Phasianus versicolor*) has the head green and the upper part of the neck shaded with blue; the nape and entire under side are dark green, deepening to pale black at the sides and centre of the belly; the mantle-feathers are blackish green, surrounded by a horseshoe-shaped line of reddish yellow,

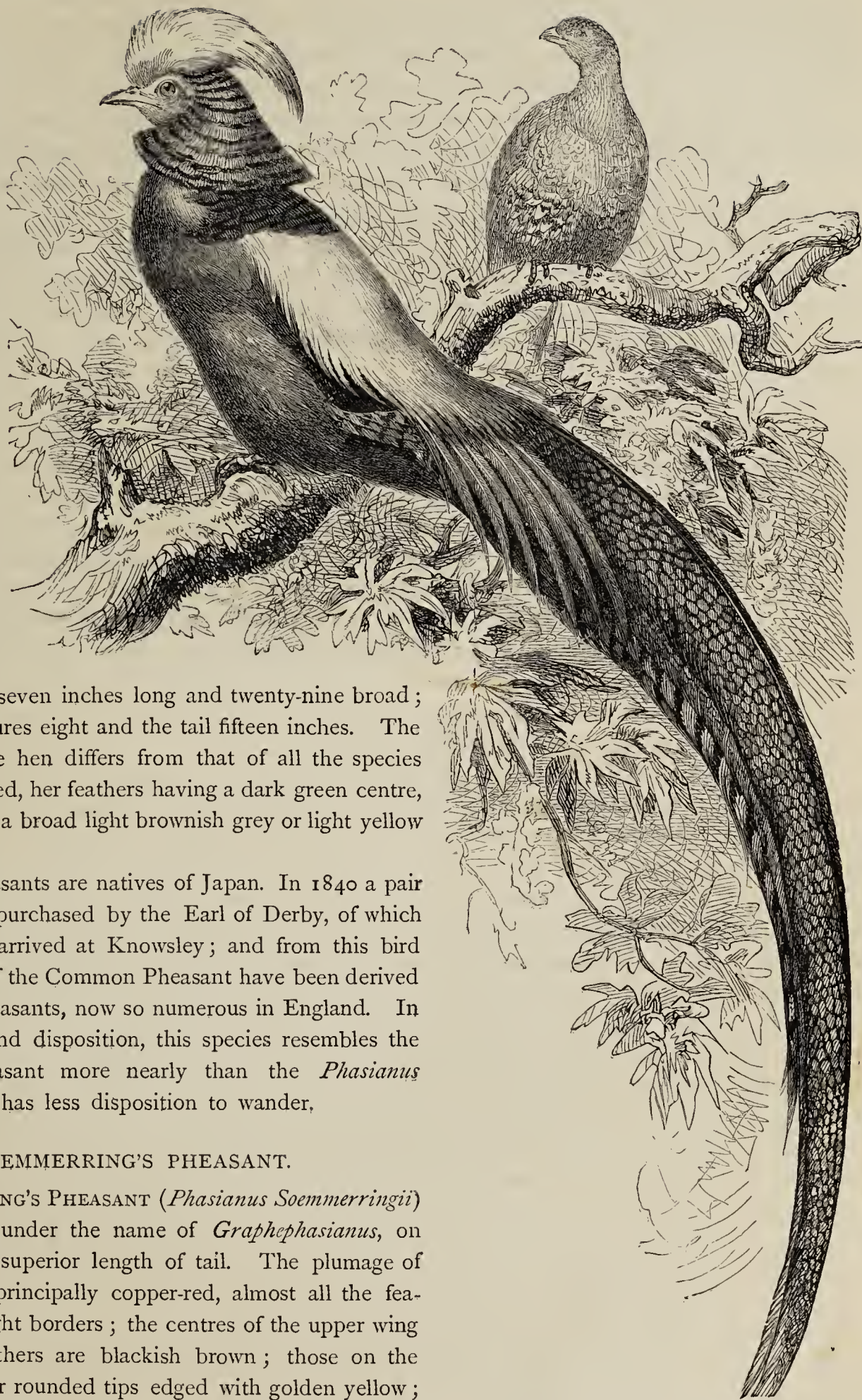
edged with rust-red; the feathers of the upper wing and tail covers are blueish greyish green; the quills brownish grey, with light stripes; and the tail-feathers reddish grey, marked with black. The eye is light brown, the beak whitish grey, and the foot light brownish grey. The

male is twenty-seven inches long and twenty-nine broad; the wing measures eight and the tail fifteen inches. The plumage of the hen differs from that of all the species above-mentioned, her feathers having a dark green centre, surrounded by a broad light brownish grey or light yellow border.

These Pheasants are natives of Japan. In 1840 a pair of them were purchased by the Earl of Derby, of which the male only arrived at Knowsley; and from this bird and a female of the Common Pheasant have been derived the Green Pheasants, now so numerous in England. In form, habits, and disposition, this species resembles the Common Pheasant more nearly than the *Phasianus torquatus*, and has less disposition to wander,

SOEMMERRING'S PHEASANT.

SOEMMERRING'S PHEASANT (*Phasianus Soemmerringii*) is also known under the name of *Grapphephasianus*, on account of its superior length of tail. The plumage of this species is principally copper-red, almost all the feathers having light borders; the centres of the upper wing and breast feathers are blackish brown; those on the rump have their rounded tips edged with golden yellow; the quills are brown, bordered with a paler tint; the eye



THE GOLDEN PHEASANT (*Thaumalea picta*).

is yellow, the beak horn-grey, the foot lead-grey. The hen is copper-red, marked with black, each feather edged with grey of various shades; those on the thighs are striped pale red and black; the quills are greyish brown, lightly bordered; the tail-feathers reddish, streaked with black and marked with deep brown; the throat and centre of the belly are light, and the lower belly dark grey.

This Pheasant, with which we became first acquainted through Dr. Siebold and Temminck, received its name from the latter, in honour of Professor Soemmerring, a distinguished naturalist.

Since the year 1860 the living bird has been brought to Europe, and those in the Zoological Gardens, London, produced a brood in June, 1865.

"The female," says Mr. Bartlett, "laid about ten eggs, but only three or four birds were hatched, and these died. The *Phasianus Soemmerringii* at the Antwerp Gardens also bred, but we are unable to say if the young arrived at maturity. In both places the males exhibited a strong inclination to destroy the females, and we come to the conclusion that the species is ill-adapted to breed in captivity."

REEVES' PHEASANT.

REEVES' PHEASANT (*Phasianus Reevesii*, or *P. veneratus*) represents a group, called by Wagler *Syrmaticus*, remarkable for their great length of tail and unusually variegated plumage. In this species the top of the head, ear-tufts, and a broad line around the throat are pure white; the sides of the head and a wide band across the breast are black, the feathers on the mantle, rump, and upper breast are golden yellow, edged with black; those of the lower breast and side whitish grey, decorated with a slender heart-shaped line, broadly edged with brownish red, and those of the belly brownish black. The feathers of the upper wing-covers are blackish brown, bordered with two lighter shades of brown; the quills are striped golden yellow and brownish black; and the tail-feathers silver-grey, dotted with red spots, surrounded by a black line, and broadly bordered with golden yellow. The eye is reddish, the beak and foot greyish yellow. This species resembles the Silver Pheasant in its general size, but has a streaming tail about six feet in length.

Considerable confusion respecting the nomenclature of this remarkable bird has been occasioned by the late M. Temminck having, in his "Histoire Naturelle Generale des Pigeons et des Gallinacés," assigned its two lengthened tail-feathers to the old *Phasianus superbus* of Linnæus, an error which he subsequently corrected, when describing and figuring this bird in his "Planches Colorées" as *P. veneratus*. M. Temminck's error was adopted by Dr. Latham; and hence, while the description of the Barred-tail Pheasant, in his "General History of Birds" (Vol. VIII., p. 190), has reference to the old *P. superbus*, some of his remarks apply to the present species. It is probable that the bird did not escape the notice of the celebrated Marco Polo, since he states "there be plenty of Feysants and very great, for 1 of them is as big as 2 of ours, with Tayles of eygth, nine, and ten spannes long, from the kingdom of Erguyl or Arguill, the western side of Tartary;" but we question if he ever saw more than the central tail-feathers, which, being held in great estimation, were considered to be suitable presents to foreigners, and hence these feathers found their way to Europe many years before the entire bird. Through Mr. Reeves, after whom this species was named by Dr. Gray, we obtained the sight of the skin of a male, and afterwards some parts of a female. He also brought a female in 1838, and both were living in the Zoological Gardens at the same time, but did not breed. Another, brought from China in 1862, lived at Mr. Kelk's seat, near Edgware, among other Pheasants, at perfect liberty and in excellent health, for two years. Since the Chinese War, living examples have successfully bred in more than one menagerie, both in England and on the Continent.

"The successful introduction of the living birds now in this country," says Mr. Tegetmeier, in the *Field* for June 7, 1867, "is owing to the combined efforts of Mr. John J. Stone, and Mr. Walter Medhurst, H.M. Consul at Hankow."

Latham saw at Sir Joseph Banks's some drawings taken from a curious collection of ancient porcelain, representing a sham-fight on the water for the Emperor's amusement, supposed to be between his Tartarian and Chinese subjects, personated by the females of his seraglio, the chieftains of the former having one of the barred feathers of this species on each side of the bonnet, and the opponents, or Chinese, having two feathers of a Pheasant of a smaller kind, probably a Golden one; hence he concludes that the present bird is a native of Tartary, and not unlikely to be as common there as the other is in China.

Dr. Bennett, in his "Wanderings in New South Wales," writes as follows:—"In Mr. Beale's splendid aviary and gardens at Macao, the beautiful *Phasianus veneratus* of Temminck, or *P. Reevesii* of Gray, now commonly known by the name of Reeves' Pheasant, was seen. It is the Che Kai of the Chinese. The longest tail-feathers of this bird are six feet in length, and are placed in the caps of the players when acting military characters. This I observed in Canton, where some of the beautiful tail-feathers (rather in a dirty condition, like the actors themselves, who in their tawdry dresses reminded me of the sweeps in London on a May-day) were placed erect on each side of their caps as a decoration. The Chinese do not venerate this bird, as was at first supposed, and which may have caused Temminck to bestow upon it the name of *Veneratus*, but it is superstitiously believed that the blood is possessed of poisonous properties, and that the mandarins, when in expectation of losing their rank and being suddenly put to death by order of the Emperor, preserve some of it upon a handkerchief in a dried state, on sucking which they fall down and instantly expire."

Mr. Beale's first male specimen, obtained in 1801, was kept in a healthy state for thirteen years. After its death he endeavoured to procure others, but did not succeed until 1831, when four specimens were brought from the interior and purchased by him for 130 dollars. These were, I believe, subsequently taken to England by Mr. Reeves.

The GOLDEN PHEASANTS (*Thaumalea*) are distinguishable from the birds above described by the comparatively small size of their bodies, their slender forms, bushy crest, and very long tail. The neck of the male is adorned with a remarkable collar of feathers that covers the nape, and is broadest under the chin.

THE GOLDEN PHEASANT.

The GOLDEN PHEASANT (*Thaumalea picta*) is most gorgeously apparelled, with a bright golden crest upon its head, and a rich orange-red collar, in which each feather is edged with deep velvety black; the feathers of the mantle are golden green, bordered with black, those on the lower back and upper tail-covers bright yellow, and those on the face, chin, and sides of throat whitish yellow. The lower neck and under side are a deep saffron-yellow, the wing-covers chestnut-brown, the quills greyish brown, edged with rust-red, the shoulder-feathers dark blue, with light borders, and most of those of the tail decorated with a black network tracery; the long, centre feathers of the upper covers are dark red, the eye is golden yellow, the beak whitish yellow, and the foot brownish. The male is thirty-two inches long and twenty-five broad, the wing measures eight and the tail twenty-two inches. The plumage of the hen is deep rust-red above, shading on the under side into a mixture of red, grey, and yellow; the feathers on the top of the head, throat, and sides, upper secondaries, and centre tail-feathers are striped brownish yellow and black, and the side tail-feathers brown, marked with yellowish grey. A very similar species lately discovered, and called *Thaumalea obscura*, is distinguishable from the above species, which in other respects it closely resembles, by the comparative darkness of its plumage during all its various changes, and by the inferior length of the tail-feathers.

The Golden Pheasant inhabits Southern Tauria and the eastern part of the desert of Mongolia, advancing in summer up to the Amoor, and also the provinces of Kansu and Setschun in the interior

of China, whence, Mr. Swinhoe tells us, living examples are brought into Canton for sale. Latham says that this bird is called in China *Kinki*, or *Kinkee*, which signifies Gold-flower Fowl, or Wrought Fowl. It is a hardy bird, and many pairs have been turned loose in our own country with the hope of naturalising it, but unfortunately they have all been shot. According to Gould it bears confinement well, and breeds freely. The sexes change considerably in appearance, and some hens kept for six years by Lady Essex gradually assumed the male feathers.

LADY AMHERST'S PHEASANT.

The LADY AMHERST'S PHEASANT (*Thaumalea Amherstiae*) is a very beautiful bird, having a black



THE CHINESE EARED PHEASANT (*Crossoptilon auritum*).

and red plume upon its head. The feathers that form the collar are of a silvery hue, with dark edges; the plumage of the neck, upper back, and upper wing-covers is light golden green, bordered with a deeper tint; and that of the lower back shaded golden yellow. The feathers of the upper tail-covers are pale red, spotted and lined with black, those on the under side pure white; the quills are brownish grey, edged with a lighter tint on the outer web; the centre tail-feathers are whitish grey, striped with black and edged with yellow, the rest are brownish grey; the lancet-shaped feathers at the sides of the upper tail-covers are coral-red, the bare patches on the cheeks blue, and the eye golden yellow; the beak is pale, and the foot dark yellow.

This species was first described by Mr. B. Leadbeater, in a paper read before the Linnæan Society, December 2nd, 1828, and received from him its name in honour of the Countess of Amherst, to whom



THE ARGUS PHEASANT, OR KUAU (*Argus giganteus*).

two males of the species had been presented by Sir Archibald Campbell, who received them from the King of Ava. They came originally from the mountains of Cochin China, and only survived the voyage to England a few weeks.

"It is now believed," says Mr. Gould, "that the bird is an inhabitant of the Chinese province of Yunnan and the adjoining region of Thibet." We have no account of its mode of life or habits.

The EARED PHEASANTS (*Crossoptilon*), are so called on account of the remarkable tufts of feathers, resembling those of some Owls, situated at the sides of the head. They are also distinguishable from the members of the family already described by their very powerful build and comparatively short tail, the feathers at the extremity of which are discomposed, and overhang the rest.

THE CHINESE EARED PHEASANT.

The CHINESE EARED PHEASANT (*Crossoptilon auritum*) has the throat and a line that passes from thence to the ear of pure white; the somewhat lax plumage on the head, the nape, upper breast, and back are black, and the mantle-feathers light brownish grey; the rump is yellowish white, and the under side pale greyish yellow; the quills and tail-feathers are yellowish grey, with a dark border to the outer web; the streaming feathers on the upper covers are greyish black. The hen is somewhat smaller than her mate, and has the long feathers less developed.

We are without particulars as to the life and habits of this Pheasant. Lamprey tells us he observed it in the markets of Peking, and heard that it is found on the mountains to the north of that town. M. Armand David also met with it in July, 1863, in the northern valley of a high mountain, fifteen leagues to the west of Peking, and was told that it is called Ho-ki, or Gho-ky, by the Chinese. When placed in an aviary these birds soon become gentle and familiar. In their wild state they frequent well-wooded spots on mountains; they perch readily, and carry their tails after the fashion of the Domestic Fowl; their somewhat varied call also much resembles the voice of that bird. The crops of three specimens killed in July were filled with the leaves of *cytisis*; and those examined in winter contained nuts, kernels, leaves of mugwort, ferns, roots, orchids, coleoptera, worms, and caterpillars. In a paper contributed to the *Zoological Society's Proceedings* for July, 1866, Mr. Saurin informs us that the hen lays at the end of May; the eggs are larger than those of a Common Fowl, and of a blueish tint. The Chinese rear these Pheasants on a kind of millet-cake; they are also very fond of barley. In 1866 two males of this species were presented to the London Zoological Gardens, and in the same year two hens were purchased from the Jardin d'Acclimatisation of Paris; since that time they have produced several broods, which have been hatched by a Domestic Hen.

THE ARGUS PHEASANT, OR KUAU.

The ARGUS PHEASANT, or KUAU (*Argus giganteus*). This magnificent species has the feathers on the upper and primary quills unusually prolonged, and broad at the tips; their shafts are soft, and the web of firm, stiff texture; the secondaries, on the contrary, are very short. The moderately long beak is compressed at its sides, slightly vaulted, bare at its base, and hooked at its tip; the long weak foot is without a spur; the tail, composed of twelve feathers, is very long and much graduated, the two centre feathers far exceeding the rest in length; the sides of the head and throat are bare, with the exception of a few black hairs; the brow, top of the head, and back of the head, on the contrary, are covered with a growth of small velvety feathers. The coloration of the plumage is more remarkable for the delicacy of its markings than for the brilliancy of its hues. The short feathers on the crown are deep black, those on the back of the neck striped yellow, and those on the nape and upper back brown, marked and dotted with light yellow. The yellowish brown feathers on the centre

of the back are yellowish grey, with round dark brown patches ; those on the under side striped and marked with reddish brown, black, and light yellow. The outer web of the secondary quills is entirely greyish red, thickly dotted with spots of shaded brown, whilst the inner web is marked with delicate white dots at its base. The long feathers of the upper wing-covers are of a beautiful dark reddish brown, marked with pale greyish red, dark brown, and yellowish white streaks of tracery, and enlivened by large lustrous round spots or eyes. These eyes are situated on the outer web, and are more perceptible upon the feathers of the second order than on the shoulder. The longest tail-feathers are black, the shafts grey on the inner and reddish brown on the outer side ; both sides of the web are decorated with a white spot, surrounded by a black edge ; the exterior tail-feathers are similarly coloured, and have their numerous spots placed in rows. Rosenberg tells us that the head and bare parts of the throat are light greyish blue, and the feet red. This fine bird is from five and a half to six feet long ; of this measurement four feet are included in the tail. The length of the real wing is seventeen inches : that of its longest feather twenty-eight inches and a half. The hen is much smaller and more quiet in appearance. The feathers on her head are striped black and yellow ; those on the upper breast and nape are of a fine reddish brown, marked with black ; those on the other parts of the back striped brownish yellow and black ; the under side is light brown, with undulating black and yellow lines ; the primary quills are brown marbled with black ; and the feathers on the upper and lower covers dark reddish brown, marked in a similar manner with a lighter shade.

The Argus Pheasant is said to be found in the woods of Sumatra, and is called by the natives Coo-ow, or Kuaow. It does not bear long confinement, and seems to have an antipathy to the light, remaining inanimate during the day. When kept in a dark place, however, it appears to be perfectly at ease, and sometimes utters the note or call from which it takes its name. This cry is rather plaintive, and not harsh like that of the Peacock. The flavour of its flesh resembles that of the Common Pheasant.

The PEACOCK PHEASANTS (*Polyplectron*) constitute a group forming the connecting link between the Argus Pheasants and the Peacocks. They have small, slender bodies ; short, decidedly rounded wings, in which the fifth and sixth quills are the longest, and the feathers of the upper covers much prolonged ; the tail is long, composed of twelve feathers, broad at its extremity and slightly graduated ; the feathers on the upper covers closely resemble those beneath them in form, colour, and markings. The long, thin tarsus is armed with from two to six spurs, the toes are short, and the claws small ; the moderate-sized beak is thin, straight, compressed at its sides, slightly curved towards the tip, and covered with feathers at its base. The plumage of the male is enlivened by numerous eyes upon the tail, and occasionally on the mantle and wing-covers.

THE CHINQUIS, OR ASSAM PEACOCK PHEASANT.

The CHINQUIS, OR ASSAM PEACOCK PHEASANT (*Polyplectron chinquis*), the most beautiful of the four species of the above group with which we are acquainted, has the head of a greyish brown, delicately dotted and lined with black ; the lower neck, breast, and centre of the belly are brown, striped with brownish black, and spotted with light yellow ; the mantle-feathers are greyish yellow, marked with small greyish black lines ; each feather being decorated with an ocellus having a green centre and glossy purple border ; the feathers of the back, rump, and large tail-covers are pale brown, spotted and marked with brownish yellow, and have a similar green and purple spot, surrounded by a black rim. The eye is bright yellow and the foot black. This species is twenty-two inches long, but of these ten inches are included in the tail. The hen is distinguished by less showy plumage, the slight excrescences that replace the spurs upon her foot, and the shortness of her tail.

The countries of Assam, Silhet, Arucan, and Tenasserim, as far as Mergui, may be regarded as the habitat of this species, which received from Linnæus, who erroneously believed Thibet to be its native country, the name of the Thibet Peacock; and even now we are but little acquainted with its habits, owing to its shy disposition, and the preference it has for the innermost recesses of dense forests. In "Ornithognomon's" "Game Birds of India" is one of the most interesting of the few notices we possess. "I have never," says the writer, "shot this bird; and, indeed, only once came upon it



THE CHINQUIS, OR ASSAM PEACOCK PHEASANT (*Polyplectron chinquis*).

This was in a narrow path leading along a ridge about 3,000 feet above the sea, in the mountains on the British side of the Thoungyen River, which separates Tenasserim from Yohan in Siam. It started so suddenly, having apparently been dusting itself in the path, and shot so rapidly across the jungle, through the *kud*, that had it not left two or three of its feathers behind I should not have known what bird I had flushed. I am not aware of any English sportsman having ever bagged one of these Pheasants; and, indeed, it frequents such inaccessible places as effectually to defy approach. The mountains in the tropics rise to a height of six or eight thousand feet above the sea, and from 6,000 feet downwards are clothed with such a dense mass of trees, thickets, underwood, bamboos, and thorny rattans, all bound together by creepers and tangle, that it would be an hour's labour to cut

any one's way through 100 yards of such stuff. I have, however," says the same writer, "kept these Peacock Pheasants in captivity, which they appear to bear tolerably well, but never become thoroughly tame. They were incessantly uttering a soft, low cluck, but emitted at times a cry or crow, being the same cluck loudly and rapidly repeated."

Two males of this species were sent by the Baba Rajendra Malhik to the London Zoological Gardens in 1857, and another pair in 1863, of which the female died; another female was obtained in 1864, which bred several times, and thus many particulars concerning their economy were learned. "Thus we know," says Mr. Sclater, "that two or three broods in a year are produced by the same pair, and are often covered by her tail, that the normal number of eggs is two, and that they are peculiarly delicate in form and colour, assimilating very closely to those of the Golden Pheasant (*Thaumalea picta*)—they are of a cream-colour, or buffy white, nearly two inches long, by one inch and seven-sixteenths broad."

Mr. Ellis, in his monograph on the *Phasianidæ*, states that Mr. Bartlett, superintendent of the Zoological Gardens, London, told him that the first time the young of this species were hatched in the Gardens, a Bantam Hen was employed as a foster mother, and the chicks would follow close behind her, never coming in front to take food, so that in scratching the ground she frequently struck them with her feet. The reason for the young keeping behind was not understood, until on a subsequent occasion two chicks were reared by a hen Chinquis, when it was observed that they always kept in the same manner behind the mother, who held her tail widely spread, thus completely covering them, and there they continually remained out of sight, only running forward when called by the hen to pick up some food she had found, and then immediately retreating to their shelter. It was thus rendered evident that the young, in following the Bantam Hen, were simply obeying the instincts of their nature, although the upright tail of their foster mother failed to afford them the protection which they would have found had they been reared by a female of their own species.

The PEACOCKS (*Pavones*) are distinguished from all other members of their family by the superiority of their size, and the extraordinary development of the feathers of the upper tail-covers. Their bodies are powerful; the neck moderately long, head small, wings short, and legs high; the beak is strong, arched at its culmen and hooked at the tip; and the foot of the male is armed with a spur. The crown of the head is adorned with a crest, formed either of long and slender or short bearded feathers. The region of the eye is bare. These fine birds only attain their full beauty when three years old.

The Peacock is a native of the East Indies and Ceylon, and is represented in Assam, the Sunda Islands, and Japan by the *Pavo nigripennis*. All the members of this glorious group frequent woods and jungle, preferring mountainous districts. On the Neilgherries and mountains of Southern India the *Pavo cristatus* is frequently met with at an altitude of 6,000 feet above the level of the sea; but it is not found in the Himalayas.

Williamson tells us that these splendid creatures abound chiefly in well-wooded localities, where there is an extent of long grass for them to range in. They are very thirsty birds, and will only remain where they can have free access to water. "About the passes in the Junglerry districts," continues the same authority, "I have seen such quantities of Pea Fowls as have absolutely surprised me. Whole woods were covered with their beautiful plumage, to which a rising sun imparted additional brilliancy. The small patches of plain among the long grass, most of them cultivated, and with mustard then in bloom, which induced the birds to feed, added beauty to the scene; and I speak within bounds when I assert that there could not be less than twelve or fifteen hundred Pea Fowls of various sizes within sight of the spot where I stood for more than an hour." When on the wing they fly heavily, generally within an easy

shot, but if only winged speedily recover, and if not closely pursued will nine times out of ten disappear. The capture of the Peacock is by no means a safe pursuit, for Williamson tells us that wherever that bird and the spotted deer abound the tiger will generally be a visitor; thus the borders of jungle containing such game are highly dangerous. At the season when the peepul berries and figs are in season their flesh is rather bitter; but when they have fed for a time among corn-fields, the flesh of the young is remarkably sweet and juicy. The nest is formed among thick shrubs or on high garden walls, or even on the roofs of houses. When the young are bred in an elevated situation, they are said to be carried to the ground by the parent on her back. The eggs, from four to six in number, are hatched within thirty days, and within three months of their birth the sex of the young is easily recognisable. When domesticated, the Peahen requires to be kept perfectly undisturbed during the period of incubation, or she will desert her little family.

THE COMMON PEACOCK.

The COMMON PEACOCK (*Pavo cristatus*) is of a magnificent purplish blue on the head, throat, and upper breast, overspread with glowing green and golden lustre; the green feathers on the back are edged and marked with copper-red; the centre of the back is deep blue, the wing white striped with black, and the under side black; the quills and tail are light brown; the long feathers of the latter, which form the graceful train that renders this bird so conspicuous, being decorated with numerous ocellated spots. The crest-feathers, from twenty to twenty-four in number, are bearded at their tips. The eye is dark brown, and the bare ring that surrounds it whitish; the beak and foot are greyish-brown. The length of this species is from three and a half to four feet; the wing measures eighteen and the tail twenty-four inches. The long train-feathers of the upper tail-covers are from four to four feet and a half in length. The female is nut-brown on the head and upper throat; the feathers on the nape are greenish, edged with whitish brown; those of the mantle light brown, marked with delicate lines; and those on the throat, breast, and belly white; the quills are brown, and the tail-feathers brown tipped with white. The hen is from thirty-six to thirty-eight inches long; her wing measures fifteen and tail from twelve to thirteen inches; her crest is much smaller and darker than that of her mate.

The general form of this magnificent bird is exceedingly elegant; and when he elevates and spreads his gorgeous train to the sun, displaying it in every way, as if conscious of the admiration he is exciting, the beholder is constrained to admit that there is no creature upon which Nature has lavished her powers of adornment with a more unsparing hand. The voice of the Peacock is extremely harsh and disagreeable, closely resembling in sound the word *paon*, which is its French name. The introduction of this bird into Europe is ascribed to Alexander the Great, but the exact date at which it was first imported into England is unknown.

This Pea-fowl inhabits the whole of India Proper, and is replaced in Assam and the countries to the east by another species. Jerdon tells us, "It frequents forests and jungly places, more especially delighting in hilly and mountainous districts; and in the more open and level country, wooded ravines and river banks are the never-failing resort of some of them. It comes forth to the open glades and fields to feed in the morning and evening, retiring to the jungles for shelter during the heat of the day, and roosting at night on high trees.

"During the courting season," says Jerdon, "the Peacock raises his tail vertically, and with it of course the lengthened train, spreading it out and strutting to captivate the hen birds; he has also the power of clattering the feathers in a most curious manner. It is a beautiful sight to come suddenly on twenty or thirty Pea-fowl, the males displaying their gorgeous trains, and strutting about in all the pomp of pride before the gratified females. The train continues to increase in length for many years. at each successive moult, but it appears to be shed very irregularly." The breeding of

the Pea-fowl in India varies, according to the locality, from April to October ; the eggs, from four to eight or nine, are laid in a secluded spot.

“ In Ceylon,” writes Sir Emerson Tennant, “ as we emerge from the deep shade and approach the park-like openings on the verge of the low country, numbers of Pea-fowl are to be found, either feeding on the seeds and fallen nuts among the long grass, or sunning themselves on the branches of the surrounding trees. Nothing to be met with in English demesnes can give an adequate idea of the size and magnificence of this matchless bird when seen in its native solitudes. Here he generally selects some projecting branch, from which his plumage may hang free of the foliage ; and if there be a dead and leafless bough, he is certain to choose it for his resting-place, whence he droops his wings and spreads his gorgeous train, or spreads it in the morning sun to drive off the damps and dews of night. In some of the unfrequented portions of the eastern province to which Europeans rarely resort, and where the Pea-fowl are unmolested by the natives, their number is so extraordinary that, regarded as game, it ceases to be sport to destroy them ; and their cries at early dawn are so tumultuous and incessant as to banish sleep, and amount to an actual inconvenience.”

The flesh is excellent when served up hot, though it is said to be indigestible ; when cold it contracts a reddish and disagreeable tinge.

Among old English dishes for high festivals the Peacock at one time held a notable place, and a “*Pecock enhakyl*” (that is, with the feathers of the tail extended) is mentioned by Fabian as one of the second course dishes at the wedding-feast of Henry VI. In an old manuscript in the Library of the Royal Society is a receipt for the dressing of this noble dish :—“ For a feste royal, Pecokkes schol be dight on this manere : Take and flee off the skin, with the fedures, tayle, and the neck and hed thereon. Then take the skynne and all the fedures, and lay hit on a tabel abroad, and straw thereon grounden comyn. Then take the Pecok and roste him, and endore him with rawe yolkes of eggs ; and when he is rosted take hym off and let hym cole a whyle, and take and sowè him in his skynne, and gild his combe, and so serve him forthe with the last cōurs.”

The flesh of the Peacock is said to be dry, but such a quality must have been amply compensated by the wholesale provision of sauce ; as, according to an old play,* among other extravagances enumerated, “ The carcasses of three fat wethers were bruised for gravy to make sauce for a single Peacock.

THE BLACK-WINGED PEACOCK.

The BLACK-WINGED PEACOCK (*Pavo nigripennis*), a very similar species, differs from the above principally in the blackish blue or blueish green feathers on the upper wing-covers. The hen has a light grey plumage, spotted with a darker shade.

THE JAPAN PEACOCK.

The JAPAN PEACOCK (*Pavo muticus*, or *Pavo spicifer*) far exceeds its congeners in beauty. In this bird the body is slender and the foot high. The crest is composed of feathers having broader tips than those in the crest of the Common Peacock. The upper throat and the head are emerald-green ; the feathers of the lower throat are adorned with blueish green spots, having golden edges ; and the emerald-green breast-feathers gleam with gold. The belly is brownish grey, the wing-covers are dark green, the quills brown, marbled with black and grey on the outer web, and the secondary quills black, with a greenish gloss. The long feathers of the upper tail-covers resemble those of the Common Peacock, but are more gorgeous. The eye is greyish brown, the bare region around blueish green, the cheek brownish yellow, the beak black, and the foot grey. The female resembles her mate, but is without the train.

* “ The City Madam,” by Massinger.

The earliest description of this splendid bird is given by Aldrovandus, in the sixteenth century ; this was taken from a drawing sent some years before by the Emperor of Japan to the Pope, who gave it to his nephew, the Marchese Tachinetti, from whom Aldrovandus received it. On the authority of this author it had been described in several scientific works, till at length, no further knowledge being gained concerning the species, its actual existence began to be doubted, and Cuvier, in his "Règne Animal," says, "Le Paon de Japon, ou Spicifère (*P. muticus*, Linn.), n'est rien moins qu'authentique. Le véritable Paon sauvage du Japon diffère peu du notre, par les couleurs, et point par l'aigrette."

M. Temminck, however, admitted the species, and described it principally from the account of Le Vaillant, who had seen an example of it in a menagerie at the Cape of Good Hope. At the time of the publication of Temminck's work, a specimen was received in the Paris collection, and two males were procured by Professor Jameson for the Ornithological Museum of Edinburgh.

The GUINEA FOWLS (*Numidæ*) are recognisable by their strongly-built body, short wings, moderate-sized tail, very long feathers in the upper tail-coverts, moderate-sized, short-toed feet, without spurs ; strong beak, and head and neck more or less denuded of feathers, and decorated with a crest, plume, wreath, or helmet of feathers, and lappets of skin. The plumage of both sexes is usually dark, enlivened with white. The female is adorned with a dress similar to that of her mate.

The ROYAL GUINEA FOWLS (*Acryllium*) differ in many particulars from all their congeners. These birds have a slender body, long thin neck, small bare head, decorated with a wreath, extending from the ears over the back of the head, and formed of very short velvety feathers ; the feathers on the throat are lancet-shaped ; the upper secondaries considerably exceed the primaries in length, and the centre tail-feathers are longer than those at the exterior. The short strong beak is much curved, and has the upper mandible very decidedly hooked at its tip ; the tarsi are high, and furnished with a spur-like wart. The members of this group are natives of Africa.

THE VULTURINE ROYAL GUINEA FOWL.

The VULTURINE ROYAL GUINEA FOWL (*Acryllium vulturinum*) has the head and upper part of the throat destitute of feathers, but besprinkled with hairs of a black colour, which are longest on the neck ; the nape is thickly clothed with short, velvet-like, brown down, and the lower part of the neck ornamented with long, lanceolate, and flowing feathers, having a broad stripe of white down the centre, to which on each side succeeds a line of dull black, finely dotted with white, and margined with fine blue. The feathers of the inferior part of the back are of a similar form, but broader, with a narrower line of white down the centre, and with the minute white dots disposed in irregular and obliquely transverse lines. The wing-coverts, back, rump, tail, under tail-coverts, and thighs, are blackish brown, ornamented with numerous round and irregular spots of white surrounded by circles of black, the intermediate spaces being filled with very minute spots of dull white ; the primaries are brown, with light shafts and spots of brownish white on the outer web ; and the tips of the inner secondaries brownish black, with three imperfect lines of white disposed lengthwise on the outer web, and three rows of irregular spots of white on the inner web ; the breast and sides of the abdomen are of a beautiful metallic blue, the centre of the abdomen black, the flanks dull pink, with numerous spots of white surrounded by circles of black ; the bill is brownish, and the feet brown.

"Independently of the chaste and delicate markings which adorn the whole of this tribe, the neck of the present species of Guinea Fowl," says Mr. Gould, "is ornamented by a ruff of lanceolate flowing plumes, which new feature, as well as the head being entirely devoid of fleshy appendages, render it conspicuously different from all its congeners. We are not able to furnish any account of its



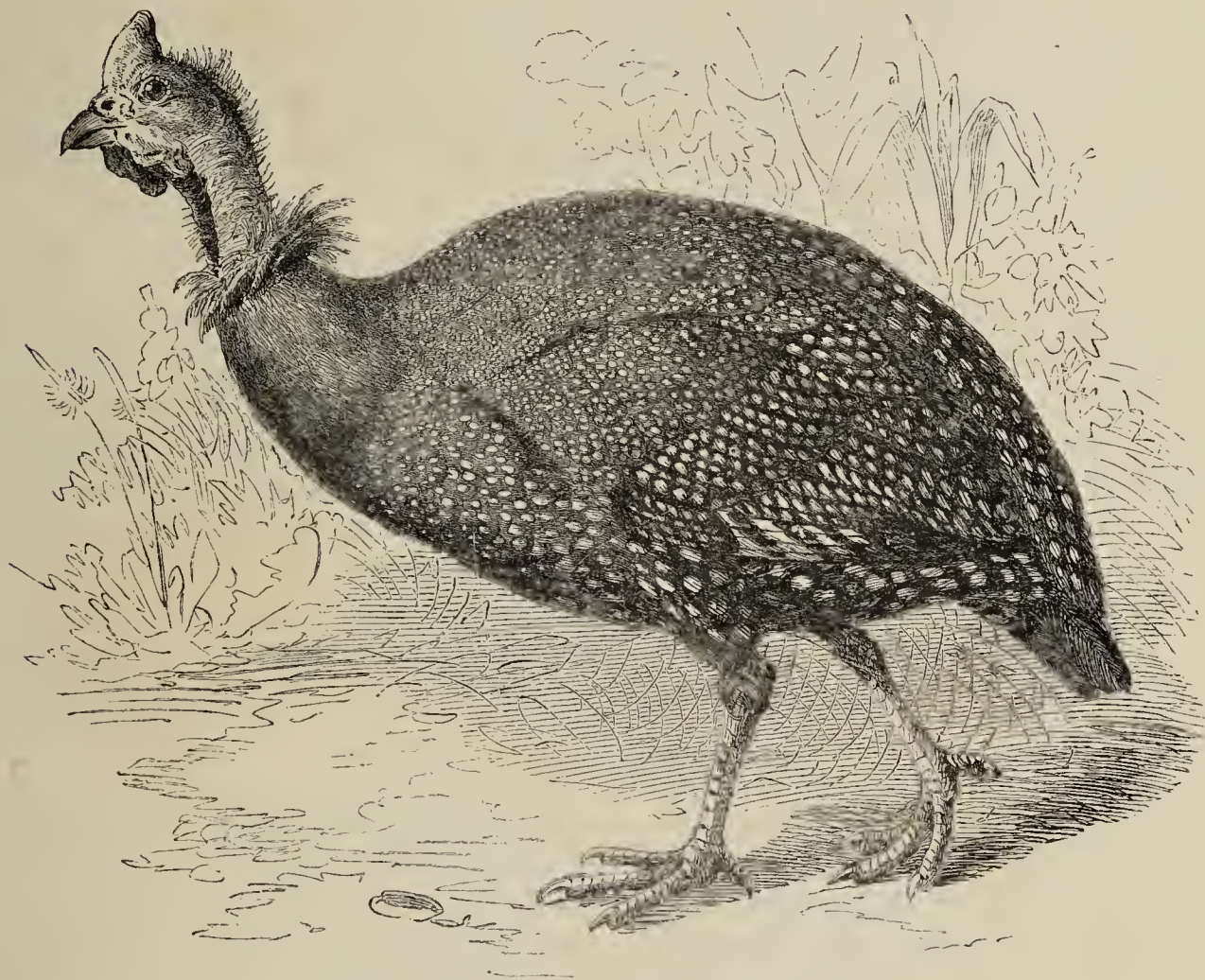
Plate 29. Cassell's Book of Birds

ITHAGINIS CORIOIDES _____ SANGUINE FRANCOLIN

(about one half Nat. size)

history further than that our figure is taken from an example, in all probability unique, forming a part of the collection of the United Service Museum, to which it was presented by Captain Probyn. It is certainly one of the most noble birds that has been discovered for some years; and we indulge in the hope that the period may not be far distant when we shall become better acquainted with the species, and that living individuals may even become denizens of our menageries and farmyards, where they would doubtless thrive equally well as their congener so familiar to us all."

The TUFTED GUINEA FOWLS (*Guttera*) are recognisable by the bushy crest upon the



THE COMMON GUINEA FOWL (*Numida meleagris*).

head, as also by their very powerful beak, moderately high tarsus, and short strong tail. The neck is without any actual lappet, but has the bare skin arranged in deep folds.

PUCHERAN'S TUFTED GUINEA FOWL.

PUCHERAN'S TUFTED GUINEA FOWL (*Guttera Pucheranii*) is of a beautiful but unusually dark blue on the back and under side, and covered with very small round or oval spots, which merge into stripes on the feathers of the upper wing-covers; the primary quills are of almost unspotted brownish grey, and the exterior secondaries broadly edged with white on the outer web. The crest is pale velvety black, the summit of the head and bare fore parts of the neck are bright red, with the folds of the skin dark greyish violet; the eye is deep brown, the beak greyish yellow with blueish base, and the foot almost black. This species is a native of South-eastern Africa.

The GUINEA FOWLS (*Numida*) form a group distinguishable by a horn-like crest on the crown of the head, and two fleshy lappets that depend from the lower mandible. Near Fuentes, in St. Jago, the chief of the Cape Verde Islands, Darwin met with these beautiful birds in large flocks. They were extremely wary, and could not be approached, running away like Partridges on a rainy day, with their heads cocked up, and if pursued readily took wing. "The discovery of a nest of wild Guinea Fowl," says that writer, "was an incident that enlivened a peculiarly toilsome part of the journey, the passage through a long but narrow watercourse, now dry, filled with masses of loose slippery stone, almost impassable for a horse. In the midst of a thick tuft of grass, within a wood, beside this rocky path, a Guinea Hen had deposited her brood of twenty eggs."

Ellis, in his "Three Visits to Madagascar," says, "Among the companions of my journey was an officer, attended by a slave carrying in a neatly-made wicker cage a pair of perfectly white Guinea Fowls, as a great rarity, and a present from the chief of a distant province to the prince." In reference to this statement, Hartlaub tells us that he considers the Guinea Fowls of Madagascar to be specifically different from such as are natives of Africa.

THE COMMON GUINEA FOWL.

The COMMON GUINEA FOWL (*Numida meleagris*), the species from which our domestic bird is derived, when in its wild state, has the breast and nape unspotted lilac, and the back and rump grey, enlivened by small white dots, surrounded with a dark line. On the upper wing-covers these spots increase in size, and merge into narrow stripes on the outer webs of the secondary quills; the under side is greyish black, adorned with large round spots; the quills are brownish, streaked with white on the outer, and irregularly dotted and marked on the inner web; the dark grey tail-feathers are beautifully spotted, and those at the exterior partially striped. The broad lappets and comb are red, the eye is dark brown, the region of the cheek and the crest blueish white, the beak reddish horn-grey, the foot dull grey, and the toes flesh-colour. When tamed and reared, this species produces a race of much larger birds; these have the plumage very variously marked, and occasionally are entirely of a whitish or reddish hue.

THE MITRED PINTADO.

The MITRED PINTADO (*Numida mitrata*) has the horn-like excrescence on the head much developed, and the chin-lappets narrow and long. The pale black plumage is spotted with white; the feathers on the nape and throat are striped with greyish white, the secondary quills have the outer web partially streaked with white. The eye is greyish brown; the upper part of the head and base of the beak are bright red, a crescent-shaped patch behind the eye, the hinder part of the neck, and the throat are greenish blue, shaded with dark blue; the fleshy lappets are violet at the base and bright red at the tip; the comb or horn is pale yellow, the beak greyish yellow, and the foot blackish blue. This species is twenty-two inches long, the wing measures ten and the tail seven inches. The Mitred Pintado is found, though not abundantly, in Madagascar and Guinea, but is common in Mozambique and in Abyssinia. We learn from Layard that its habitat extends over the whole of the frontier district, into Ovampolando on the west, and to the Mozambique on the east, and that it is still abundant in some places within the colony, where the mimosa bush affords it sufficient shelter. It feeds on grain and insects, and lays from seven to ten eggs, rather sharply pointed at the small and rounded at the obtuse end. These are of a dark cream-colour, minutely dotted over with pin-points of brown.

The same authority tells us that these Guinea Fowls rear their young much in the same manner as our Pheasants do. If the female is startled she flies off and leaves her little family, who at once disperse in every direction, and hide so cunningly amongst the grass and bushes that they are seldom discovered: they usually remain in their concealment until called together again by the shrill note of

the parent bird. In the Fish River Valley they roost upon the willow-branches that project over the large holes of water, out of the reach of wild cats. The *Phasidus niger* and *Agelastus meleagrides*, two very similar species, are natives of Western Africa.

According to M. du Chaillu, the *Phasidus niger* was met with by him from fifty to one hundred miles in the interior, reckoning from Cape Lopez, and was unknown to the inhabitants of the Cape. He obtained but a single specimen.

THE TUFT-BEAKED PINTADO.

The TUFT-BEAKED PINTADO (*Numida ptilorhyncha*), a very similar species, has the stiff feathers that encircle the throat of a velvety black, whilst those of the body are dark brownish grey, dotted with white. These markings become more perceptible on the upper wing-covers, and take an oval form on the outer web of the shoulder-feathers; the under side has a blueish grey lustre; the breast, sides, and lower tail-covers are decorated with large round spots. The brownish grey quills are more or less distinctly margined with light grey or whitish edges; the lower secondaries have a light blueish grey border, tinted with two shades of brownish grey, and, like the tail-feathers, are very distinctly spotted. The eye is brown and the cheek light blue, as are the large broad lappets; the throat is flesh-red, the bare crown of the head greyish yellow, and the tuft of bristle-like hairs at the base of the upper mandible, from which these birds derive their name, light yellow; the bill is reddish at its base and grey at its tip; the foot dark greyish brown.

This species is a native of Abyssinia and Nubia, where it frequents valleys bordered with thickets, and renders itself remarkable by its extremely harsh voice. It seldom flies, and then only for a short distance to escape from danger. The flesh is exceedingly savoury.

The TURKEYS (*Meleagrides*) are large but comparatively slender birds, with long legs and short wings and tail; the moderate-sized head and neck are unfeathered and covered with warts; the short, strong beak, from which depends a fleshy wattle, has the upper mandible curved and vaulted. The high foot is furnished with long toes, the rounded wing has its third quill longer than the rest; and the tail, composed of eighteen broad, upright feathers, is also slightly rounded at its extremity. The thick heavy plumage is unusually glossy. One remarkable characteristic of these birds is the bristle-like structure of some of the breast-feathers, some of which are much longer than those of the rest of the body. The members of this group inhabit the forests, prairies, and open tracts of North America; the males wandering about the country in small parties of from ten to one hundred, and seeking their food apart from the females, who are occupied in feeding their young. Turkeys are found in a wild state from Canada to Panama, and so far from being improved by the care of man, have remarkably degenerated in a state of domesticity. When wild they often weigh from twenty to sixty pounds, and when standing upright, measure at least three feet in height. Formerly these birds were common in Canada and the central parts of the United States, but they have gradually fallen back before the advance of civilisation, although they only seem to yield their country inch by inch to the husbandman.

THE PUTER, OR WILD TURKEY.

The PUTER, or WILD TURKEY (*Meleagris gallopavo*), is of a brownish yellow on the upper parts of the body, which gleam with a beautiful metallic lustre, each feather having a broad resplendent black edge. The hinder portions of the back-feathers and tail-covers are dark reddish brown, striped green and black; the yellowish brown breast is darkest at its sides; the belly and legs are brownish grey, and the feathers on the rump pale black, faintly edged with a darker shade. The quills are

blackish brown, the primaries greyish white, and the secondaries brownish, striped with white ; the tail-feathers are brown, dotted and marked with black. The bare parts of the head and throat are pale sky-blue, the warts that cover the face bright red, and the lower region of the eye ultramarine-blue. The eye is yellowish blue, the beak whitish grey, and the foot pale violet or bright red. This species is from forty to forty-four inches long, and from fifty-three to sixty broad ; the wing measures eighteen and the tail fifteen inches. The plumage of the hen, though somewhat resembling that of the male,



THE OCELLATED TURKEY (*Meleagris ocellata*), ONE-FIFTH NATURAL SIZE.

is much less beautifully coloured ; her length does not exceed thirty-five inches, and her breadth forty-eight inches and a half ; the wing measures fifteen and the tail eleven inches.

Of the many accounts respecting the life of the Wild Turkey of North America, none is more excellent than the following from the pen of Audubon :—"The unsettled parts of the States of Kentucky, Ohio, Illinois, and Indiana, an immense extent of country to the north-west of those districts upon the Mississippi and Missouri, and the vast regions drained by these rivers from their confluence to Louisiana, including the wooded parts of Arkansas, Tennessee, and Alabama, are most abundantly supplied with this magnificent bird. It is less plentiful in Georgia and the Carolinas, becomes still scarcer in Virginia and Pennsylvania, and is now very rarely seen to the east

of the last-mentioned States." It is already extirpated from the thickly-peopled portions of the continent.

"The Turkey," continues Audubon, "is irregularly migratory, as well as irregularly gregarious. When the supply of food in one portion of the country happens greatly to exceed that of another, the Turkeys are insensibly led towards that spot, by gradually meeting in their haunts with more fruit the nearer they advance towards the place where it is most plentiful. In this manner flock follows after flock, until one district is entirely deserted, while another is, as it were, overflowed by them.

"About the beginning of October, when scarcely any of the seeds and fruits have yet fallen from the trees, these birds assemble in flocks, and gradually move towards the rich bottom-lands of the Ohio and the Mississippi. The males, or as they are more commonly called, the 'gobblers,' associate in parties of from ten to a hundred, and search for food apart from the females; while the latter are seen advancing singly, each with its brood of young, then about two-thirds grown, or in connection with other families, forming parties amounting to seventy or eighty individuals, all intent on shunning the old cocks, which, even when the young birds have attained this size, will fight with and often destroy them by repeated blows on the head. Old and young, however, all move in the same course and on foot, unless their progress be interrupted by a river, or the hunter's dog force them to take wing. When they come to a river they betake themselves to the highest eminences, and there often remain a whole day, or sometimes two, as if for the purpose of consultation. During this time the males are heard gobbling, calling, and making much ado, and are seen strutting about as if to raise their courage to a pitch befitting the emergency. Even the females and young assume something of the same pompous demeanour, spread out their tails and run round each other, purring loudly and performing extravagant leaps. At length, when the weather appears settled, and all around is quiet, the whole party mount to the tops of the highest trees, whence, at a signal consisting of a single cluck given by a leader, the flock takes flight for the opposite shore. The old and fat birds easily get over, even should the river be a mile in breadth; but the young and less robust frequently fall into the water, not to be drowned, however, as might be imagined. They bring their wings close to their body, spread out their tail as a support, stretch forward their neck, and striking out their legs with great vigour, proceed rapidly towards the shore, on approaching which, should they find it too steep for landing, they cease their exertions for a few moments, float down the stream until they come to an accessible part, and by a violent effort generally extricate themselves from the water. It is remarkable that immediately after thus crossing a large stream, they ramble about for some time as if bewildered; in this state they fall an easy prey to the hunter.

"When the Turkeys arrive in parts where food is abundant, they separate into smaller flocks, composed of birds of all ages and both sexes, promiscuously mingled, and devour all before them. This happens about the middle of November. So gentle do they sometimes become after these long journeys, that they have been seen to approach the farmhouses, associate with the Domestic Fowls, and enter the stables and corn-cribs in quest of food. In this way, roaming about the forests, and feeding chiefly on mast, they pass the autumn and part of the winter.

"As early as the middle of February the females separate and fly from the males, the latter strenuously pursue, and begin to gobble or to utter their notes of exultation. The sexes roost apart, but at no great distance from each other. When a female utters a call-note, all the gobblers within hearing return the sound, rolling note after note with as much rapidity as if they intended to emit the first and last together, not with spread tail, as when fluttering round the females on the ground, or practising on the branches of the trees on which they have roosted for the night, but much in the manner of the Domestic Turkey, when an unusual or unexpected noise elicits its singular hubbub.

If the call of the female comes from the ground, all the males immediately fly towards the spot, and the moment they reach it, whether the hen be in sight or not, spread out and erect their tail, draw the head back on the shoulders, depress their wings with a quivering motion, and strut pompously about, emitting at the same time a succession of puffs from the lungs, and stopping now and then to listen and look, but whether they spy the female or not they continue to puff and strut, moving with as much celerity as their ideas of ceremony seem to admit. While thus occupied the males often encounter each other, in which case desperate battles take place, ending in bloodshed and often in the loss of many lives, the weaker falling under the blows inflicted upon the head by the stronger. The moment a rival is dead the conqueror treads him under foot, but what is strange, not with hatred, but with all the motions which he employs in caressing the female.

“About the middle of April, when the season is dry, the hens begin to look out for a place to deposit their eggs. This place requires to be as much as possible concealed from the eyes of the Crow, as that bird watches the Turkey when going to her nest, and, waiting in the neighbourhood until she has left it, removes and eats the eggs. The nest, which consists of a few withered leaves, is placed on the ground, in a hollow scooped out by the side of a log, or in the fallen top of a dry leafy tree, under a thicket of sumach or briars, or a few feet within the edge of a cornbrake, but always in a dry place. When laying her eggs the female approaches her nest very cautiously, scarcely ever following the same track twice, and when she leaves them covers them so carefully with leaves that it is very difficult for any person to find the nest, unless the mother has been suddenly started from it. When on her nest, if she perceives an enemy, she sits still and crouches low until the intruder has passed by, unless she is aware that she has been discovered.”

“I have frequently,” says Audubon, “approached within five or six paces of a nest, of which I was previously aware, assuming an air of carelessness, and whistling or talking to myself, the female remaining undisturbed; whereas if I went cautiously towards it, she would never suffer me to approach within twenty paces, but would run off, with her tail spread on one side, to a distance of twenty or thirty yards, when, assuming a stately gait, she would walk about deliberately, uttering now and then a cluck.”

The mother seldom abandons her nest on account of its having been disturbed by man, but if robbed by a snake or other wild animal she never approaches it again. If her brood has been destroyed, she lays a second set of eggs, but usually rears only one brood in the season. Sometimes several mothers lay their eggs in the same nest. Audubon once found three sitting upon forty-two eggs. In such a case one or other of the females always keeps guard over the nest, to prevent the approach of the weaker kind of enemies. When nearly hatching, the hen will not leave her eggs for any consideration, and will rather allow herself to be fenced in than desert her nest. Audubon tells us he once witnessed the hatching of a brood of Turkeys.

“I concealed myself,” he says, “on the ground, within a very few feet, and saw the female raise herself half the length of her legs, look anxiously upon the eggs, cluck with a sound peculiar to the mother on such occasions, carefully remove each half-empty shell, and with her bill caress and dry the young birds that already stood tottering and attempting to make their way from the nest. I saw them all emerge from the shell, and in a few moments after tumble, roll, and push each other forward, with astonishing and inscrutable instinct.”

Before the old bird leaves the nest she shakes herself violently, preens her feathers, and assumes quite a different appearance; she raises herself, stretches out her neck, and glances about and around to detect any enemy that may be nigh, spreads her wings, and clucking softly, endeavours to keep her young family together. As the brood are usually hatched in the afternoon, they often return and spend the first night in the nest, but afterwards remove to higher undulating ground, the mother dreading the

effects of rain on her young, which seldom survive if thoroughly wetted at this tender age, when their only covering is a soft, delicate, hairy down. In about fourteen days the young birds, which till this time had rested on the ground, are able to fly to some low branch, and pass the night under the sheltering wings of their mother. A little later they leave the woods during the day, and search the prairies and glades for berries of various kinds, and grasshoppers. The young now rapidly increase in size and strength, and about the month of August are able to escape the attacks of their four-footed enemies by rising from the ground to the highest branches of the trees. About this time young and old assemble together and begin their pilgrimage.

Wild Turkeys will sometimes feed and associate with tame ones, whose owners are glad to welcome them, the half-breed being much the most hardy, and easily reared.

“While at Henderson,” says Audubon, “I had among other birds a fine male Turkey, which had been reared from its earliest youth under my care, it having been caught by me when probably not more than two or three days old. It became so tame that it would follow any person who called it, and was the favourite of the little village; yet it would never roost with the tame Turkeys, but regularly betook itself at night to the roof of the house, where it remained till dawn. When two years old it began to fly to the woods, where it remained for a considerable part of the day, returning to the enclosure as soon as night approached. It continued this practice until the following spring, when I saw it several times fly from its roosting-place to the top of a high cotton tree on the Ohio, from which, after resting a little, it would sail to the opposite shore, the river being nearly half a mile wide, and return towards night. One morning I saw it fly off at a very early hour to the woods, in another direction, and took no particular notice of the circumstance. Several days elapsed, but the bird did not return. I was going towards some lakes near Green River, to shoot, when having walked five miles I saw a fine large gobbler cross the path before me, moving leisurely along. Turkeys being then in prime condition for the table, I ordered my dog to chase it and put it up. The animal went off with great rapidity, and as it approached the Turkey, I saw with much surprise that the latter paid little attention. Juno was on the point of seizing it, when she suddenly stopped and turned her head towards me. I hastened to them, but you may easily conceive my surprise when I saw my own favourite bird, and discovered that it had recognised the dog and would not fly from it, although the sight of a strange dog would have caused it to run off at once.”

The Wild Turkeys do not restrict themselves to any particular kind of food, but prefer the winter grape and the pecan-nut, being found in the greatest numbers where these are plentiful. They eat grass and various herbs, corn, berries, fruit, insects, tadpoles, and small lizards. When walking, these birds often open their wings a little, folding them again over each other, as if their weight were too great, then run a short distance, spreading their pinions and fanning their sides after the manner of the Domestic Fowl, then leaping two or three times into the air, and shaking themselves. While searching for food they keep the head raised, and are always on the watch, meanwhile scratching with their feet, and snatching up at once with the beak any prey which they may have found. In summer they roll themselves in the dust of roads or ploughed fields to clear themselves from ticks. After snow, when the ground becomes hard, the Turkeys will remain on their sleeping-places without food for three or four days, but sometimes venture into farmyards to the stacks of corn and stables, in search of grain. During falls of melting snow they run to surprising distances, and with such rapidity that no horse can keep up with them; late in the spring, however, their strength is not so great, and a good dog is able to overtake them.

With the exception of man, the most formidable enemies of the Wild Turkey are the lynx, the Snowy Owl, and the Virginian Owl. The lynx pursues both old and young, sucks their eggs, and does them great injury. The Owls attack them when roosting on the branches of trees, hovering

around them with silent wing. "This, however," says Audubon, "is rarely done without being discovered; a single cluck from one of the party announces the approach of the murderer. They instantly start upon their legs and watch the motions of the Owl, which, selecting one as its victim, comes down upon it like an arrow, and would inevitably secure the prize, did not the latter at that moment lower its head, stoop, and spread its tail in an inverted manner over its back, so that the aggressor is met by a smooth inclined plane, along which it glances without hurting the Turkey; immediately after which the latter drops to the ground, and thus escapes merely with the loss of a few feathers."

Turkeys are hunted in all parts of America with ardour, but always in moderation. They are shot at pairing-time, and also when at roost; but they are most commonly caught in pens, in a manner thus described by Audubon:—

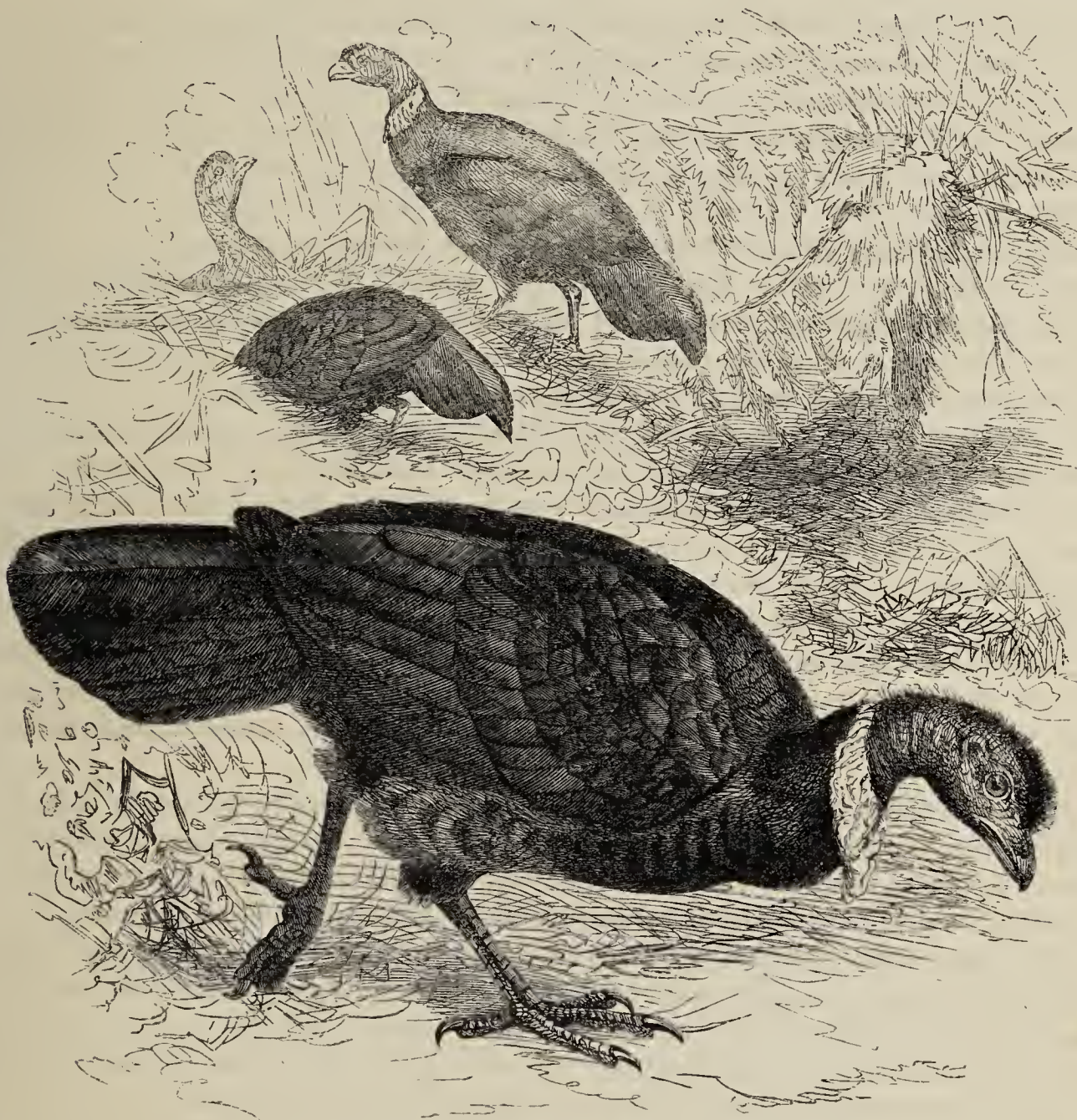
"Young trees, of four or five inches in diameter, are cut down and divided into pieces of the length of twelve or fourteen feet. Two of these are laid on the ground parallel to each other, at a distance of ten or twelve feet. Two others are laid across the ends of these at right angles to them, and in this manner successive layers are added until the fabric is raised to the height of about four feet. It is then covered with similar pieces of wood, placed three or four inches apart, and loaded with one or two heavy logs to render the whole firm. This done, a trench about eighteen inches in depth and width is cut under one side of the cage, into which it opens slantingly and rather abruptly. It is continued on its outside to some distance, so as gradually to attain the level of the surrounding ground. Over the part of this trench within the pen, and close to the wall, some sticks are placed so as to form a kind of bridge about a foot in breadth. The trap being now finished, the owner places a quantity of Indian corn in its centre, as well as in the trench; and as he walks off, drops here and there a few grains in the woods, sometimes to the distance of a mile. This is repeated at every visit to the trap after the Turkeys have found it. No sooner has a Turkey discovered the train of corn than it communicates the circumstance to the flock by a cluck, when all of them come up, and searching for the grains scattered about, at length come upon the trench, which they follow, squeezing themselves one after another through the passage under the bridge. In this manner the whole flock sometimes enters, but more commonly six or seven only, as they are alarmed by the least noise, even the cracking of a tree in frosty weather. Those within having gorged themselves, raise their heads, and try to force their way through the top or sides of the pen, passing and repassing on the bridge, but never for a moment looking down or attempting to escape by the passage by which they entered. Thus they remain until the owner of the trap arriving closes the trench and secures his captives. I have heard of eighteen Turkeys having been caught in this manner at a single visit to the trap."

When Turkeys are abundant, the owners sometimes neglect to visit their traps, and the poor prisoners are starved for want of food, for they never retrace their steps along the trench, as they might readily do, and thus regain their liberty.

The AUSTRALIAN JUNGLE FOWLS (*Megapodinæ*) form a group of Australian birds, distinguished from all their feathered brethren by the strange manner in which their broods are incubated. For this process mounds of grass and earth are erected by the parents to receive their unusually large eggs, which are hatched by means of the heat engendered by the decaying vegetable matter. The young do not quit the shell until they are fully fledged and capable of supporting themselves. Gould is of opinion that this singular way of incubating the eggs, and the very small size of their brain, indicate that the *Megapodinæ* hold but a low place in the scale of intelligence. Naturalists are much at variance concerning the systematic position of these birds, but in our

own opinion Reichenbach is correct in considering them as nearly allied to the *Gallinaceæ*, and we shall therefore adopt his arrangement.

The TALLEGALLI (*Tallegalli*) are recognisable by their strong curved beak, short toes, small much-rounded wings, and the bare patches on the head, neck, and breast. These birds inhabit the



THE BRUSH TURKEY (*Cathartus Lathamii*).

dense brushes, scrubby gullies, and primeval forests of Australia and New Guinea, where they are met with in small flocks on the ground. In disposition they are very shy, and when disturbed endeavour to escape by running into the thick brush or by flying up to the branches of trees, and then ascending to the top, which they gain by leaping from bough to bough; having attained the summit they sometimes fly off to a new locality in the underwood. During the mid-day heat they generally seek shelter under the shady branches of trees, often uttering a low chuckling noise; they also dust themselves on the ground, after the manner of other Gallinaceous Birds. Their food consists of seeds, berries, and insects.

The BRUSH TURKEYS (*Catheturus*) are recognisable by their powerful frame, moderate-sized neck, large head, short rounded wings, and tail of medium length, composed of eighteen feathers; their soft woolly down, and a slight hairy growth on the head and neck. The fore part of the throat exhibits a long fleshy excrescence. These remarkable birds are natives of Australia.

THE BRUSH TURKEY, OR WATTLED TALLEGALLUS.

The BRUSH TURKEY, OR WATTLED TALLEGALLUS (*Catheturus*, or *Tallegallus Lathamii*), is of a beautiful chocolate-brown on the upper portions of the body, and light brown on the under side, which is marked with silver-grey. The eye is light brown, the wattle bright yellow, the beak lead-grey, and the foot light reddish brown. The bare skin on the head and neck is scarlet. This species is two feet and a half long; the wing measures twelve inches, and the tail nine inches and a half. The female closely resembles her mate.

“How far the range of the Wattled Tallegallus may extend,” says Mr. Gould, “is not yet satisfactorily ascertained; it is known to inhabit various parts of New South Wales, from Cape Howe to Moreton Bay, and Mr. Macgillivray informed me that he had killed it as far up the east coast as Port Molle. The assaults of the cedar-cutters and others, who frequently hunt through the brushes of Illawarra and Maitland, had, however, nearly extirpated it from those localities when I visited the colony in 1838, and it probably does not now exist there; but I believe it is still plentiful in the dense and little-trodden brushes of the Manning and Clarence. I was at first led to believe the country between the mountain ranges and the coast constituted its sole habitat, but I was agreeably surprised when I found it in the Liverpool brushes and in the scrubby gullies and sides of the lower hills that branch off towards the interior.

“It has often been asserted that Australia abounds in anomalies, and in no instance is the truth of this assertion more fully exemplified than in the history of this very singular bird, respecting the situation of which in the natural system much diversity of opinion, as above noticed, has hitherto prevailed. It was consequently one of the birds which demanded my utmost attention during my visit to Australia.

“The most remarkable circumstance connected with the economy of this species is the fact of its eggs not being incubated in the manner of other birds. At the commencement of the spring the Wattled Tallegallus scratches together an immense heap of decaying matter as a depository for the eggs, and trusts to the heat developed by the process of fermentation for the development of the young. The heap employed for this purpose is collected by the birds during several weeks previous to the period of laying; it varies in size from two to many cartloads, and in most instances is of a pyramidal form. The construction of the mound is either the work of one pair of birds, or, as some suppose, of the united labours of several; the same site appears to be resorted to for several years in succession, the birds adding a fresh supply of materials each succeeding season.

“The materials composing these mounds are accumulated by the bird grasping a quantity in its foot, and throwing it backwards to a common centre, the surface of the ground for a considerable distance being so completely scratched over that scarcely a leaf or blade of grass is left. The mound being completed, and time being left for sufficient heat to be engendered, the eggs are deposited in a circle at the distance of nine or twelve inches from each other, and buried more than an arm's depth, with the large end upwards; they are covered up as they are laid, and allowed to remain until they are hatched. I have been credibly informed, both by natives and settlers living near their haunts, that it is not unusual to obtain half a bushel of eggs at a time from a single mound, and I have myself seen a native woman bring to the encampment in her net half that quantity, as the spoils of a foraging excursion to the neighbouring scrub. Some of the natives state that the females are constantly in the

neighbourhood of the mound about the time the young are likely to be hatched, and frequently uncover and cover them up again, apparently for the purpose of assisting those that may have appeared, while others have informed me that the eggs are merely deposited and the young allowed to force their way unassisted. One point has been clearly ascertained, namely, that the young, from the hour that they are hatched, are clothed with feathers, and have their wings sufficiently developed to enable them to fly on to the branches of trees, should they need to do so to escape from danger. They are equally nimble on their legs; in fact, as a moth emerges from a chrysalis, dries its wings, and flies away, so the youthful *Tallegallus*, when it leaves the egg, is sufficiently perfect to be able to act independently and procure its own food.

“Although, unfortunately,” continues Mr. Gould, “I was almost too late for the breeding season, I nevertheless saw several of these hatching mounds, both in the interior of New South Wales and at Illawarra. In every instance they were placed in the most retired and shady glens and on the slope of a hill, the part above the mound being scratched clean, while all below remained untouched, as if the birds had found it more easy to convey the materials down than to throw them up. The eggs are perfectly white, of a long oval form, three inches and three-quarters long, by two inches and a half in diameter.”

In the Gardens of the Zoological Society in the Regent's Park, several old birds have constructed mounds, in which they deposited eggs, and their young have become developed.

“In the year 1854,” says Mr. Sclater, “the singular phenomenon of the mound-raising faculty of the *Tallegallus*, which had been well ascertained in Australia by Mr. Gould, was effectually displayed by a pair of birds.

“On being removed into a sufficiently large enclosure, with an abundance of vegetable material within reach, the male began at once to throw it up into a heap behind him, by a scratching motion of his powerful feet, which projected each footful as he grasped it for a considerable distance in the rear. As he always began to work at the outer margin of the enclosure, the material was thrown inwards in concentric circles until it sufficiently neared the spot selected for the mound to be jerked upon it. As soon as the mound had risen to a height of about four feet, both birds worked in reducing it to an even surface, and then began to excavate a depression in the centre. In this in due time the eggs were placed, as they were laid, and arranged in a circle about fifteen inches below the summit of the mound, at regular intervals, with the smaller end of the egg pointing downwards. The male bird watched the temperature of the mound very carefully; the eggs were generally covered, a cylindrical opening being always maintained in the centre of the circle for the purpose of giving air to them, and probably to prevent the danger of a sudden increase of heat from the action of the sun, or accelerated fermentation in the mound itself. In hot days the eggs were nearly uncovered two or three times between morning and evening. In about a month after the first egg was supposed to have been laid a young bird was hatched, and is still living with its parents. Subsequent observation enables us to state that on the young bird chipping out of the egg, it remains in the mound for at least twelve hours, without making any effort to emerge from it, being at that time almost as deeply covered up as the rest of the eggs. On the second day it comes out with each of its wing-feathers well developed in a sheath which soon bursts, but apparently it has no inclination to use them, its powerful feet at once giving it ample means of locomotion. Early in the afternoon the young bird retires to the mound again, and is partially covered up for the night by the assiduous father, but at a diminished depth as compared with the circle of eggs from which it emerged in the morning. On the third day the nestling is capable of flight, and one of them accidentally forced its way through the strong netting which covered the enclosure.”

In its native woods this species lives in small companies like other *Gallinae*, and while on the

ground appears shy and distrustful, but quite fearless when in the trees. "While stalking about the trees," says Mr. Gould, "the *Tallegallus* utters a rather loud clucking noise, but whether this sound is only produced by the female I could not ascertain; still, I think that such is the case, and that the spiteful male, who appears to delight in expanding his richly-coloured fleshy wattles and unmercifully thrashing his helpmate, is generally mute. In various parts of the brush I observed depressions in the earth, which the natives informed me were made by the birds in dusting themselves."

When disturbed, the Wattled *Tallegallus* readily eludes pursuit by the facility with which it runs through the tangled brush. If hard pressed, or when rushed upon by its great enemy the native dog, it springs upon the lowermost bough of some neighbouring tree, and by a succession of leaps from branch to branch ascends to the top, and either perches there or flies off to another part of the brush. It has also the habit of resorting to the branches of trees as a shelter from the mid-day sun, a peculiarity that greatly tends to its destruction; for, like the Ruffed Grouse of America, when assembled in small companies, these birds will allow a succession of shots to be fired until they are all brought down. Unless some measures be adopted for their preservation, this circumstance must lead to an early extinction of this singular species—an event much to be regretted, since, independently of its being an interesting object for the aviary, it is an excellent bird for the table.

THE MALEO.

The MALEO (*Megacephalon Maleo*) is characterised by a hard, round excrescence that commences at the nostrils and passes over the brow to the back of the head. The powerful beak is ridged at its culmen, and has the margin of the lower mandible almost straight; the third quill in the shell-shaped wing is longer than the rest; the rounded tail is composed of eighteen feathers, and the strong foot furnished with short toes. The plumage on the back, a band on the breast, and the region of the vent and thighs are blackish brown, and the breast and belly pale rose-red. The eye is yellow, the bare part of the head whitish blue, the occipital protuberance blue; the beak and the fore part of the foot are horn-grey. This species is twenty-four inches long; the wing measures eleven and the tail eight inches.

"In the months of August and September," says Wallace, "when there is little or no rain, the Maleos come down in pairs from the interior to one or two favourite spots, and scratch holes three or four feet deep, just above high-water mark, where the female deposits a single large egg, which she covers with about a foot of sand, and then returns to the forest. At the end of ten or twelve days she comes again to the same spot to lay another egg, and each female bird is supposed to lay six or eight eggs during the season. The male assists the female in making the hole, coming down and returning with her. The appearance of these birds when walking on the beach is very handsome. The glossy black and rosy white of the plumage, the helmeted head, and elevated tail, like that of the Common Fowl, give a striking character, which their stately and somewhat sedate walk renders still more remarkable. There is hardly any difference between the sexes, except that the casque or bonnet at the back of the head and the tubercles at the nostrils are a little larger, while the beautiful rosy salmon-colour is perhaps deeper in the male bird; but the difference is so slight that it is not always possible to tell a male from a female without dissection. They run quickly, but when shot at or suddenly disturbed take wing with a heavy noisy flight to some neighbouring tree, where they settle on a low branch; they probably roost at night in a similar situation. Many females lay in the same hole, for a dozen eggs are often found together, and these are so large that it is not possible for the body of the bird to contain more than one fully-developed egg at the same time. In all the female birds which I shot," continues this author, "none of the eggs besides the one large one exceeded the size of peas, and there were only eight or nine of these, which is possibly the extreme number a bird can lay in the season."

“ Arrived at our destination, we built a hut, and prepared for a stay of some days, I to shoot and skin Maleos. The place is situated in the large bay between the islands of Limbé and Banca, and consists of a steep beach more than a mile in length, of deep, loose, and coarse black volcanic sand, or rather gravel, very fatiguing to walk over. It is in this loose black sand that those singular birds, the Maleos, deposit their eggs.

“ Every year the natives come for fifty miles round to obtain these eggs, which are esteemed a great delicacy, and when quite fresh are indeed delicious. They are richer than Hens' eggs, and of a finer flavour, each one completely fills an ordinary tea-cup, and forms, with bread or rice, a very



THE MALEO (*Megacephalon Maleo*), ONE-FOURTH NATURAL SIZE.

good meal. The colour of the shell is a pale brick-red, or very rarely pure white. They are elongate, and very slightly smaller at one end, from four to four and a half inches long, by two and a quarter and two and a half wide.”

After the eggs are deposited in the sand they are no further cared for by the mother. The young birds on breaking the shell, work their way up through the sand, and run off at once to the forest. “I was assured by Mr. Duivenfoden, of Ternate,” says Wallace, “that they can fly the very day they are hatched. He had taken some eggs on board his schooner which were hatched during the night, and in the morning the little birds flew readily across the cabin. Considering the great distances the hens come to deposit the eggs in a proper situation (often ten or fifteen miles), it seems extraordinary that they should take no further care of them. It is, however, quite certain that they neither do nor can watch them. The eggs being deposited by a number of hens in succession in the same hole would render it impossible for each to distinguish its own, and the food necessary for such large birds,

consisting entirely of fallen fruits, can only be obtained by roaming over an extensive district ; so that if the numbers which come down to this single beach in the breeding season, amounting to many hundreds, were obliged to remain in the vicinity, many would perish of hunger." In the structure of the feet of this bird we may detect a cause for its departing from the habits of its nearest allies, the *Megapodii* and *Tallegalli*, which heap up earth, leaves, stones, and sticks into a large mound, wherein they bury their eggs. The feet of the Maleo are not nearly so large or strong in proportion as in these birds, while its claws are short and straight instead of being long and curved. The toes are, however, strongly webbed at the base, forming a broad powerful foot, this, with the rather long leg, is well adapted to scratch away the loose sand (which flies up in a perfect shower when the birds are at work), but they could not, without much labour, accumulate the heaps of miscellaneous rubbish brought together by the large grasping feet of the Megapodius.

THE OCELLATED LEIPOA.

The OCELLATED LEIPOA (*Leipoa ocellata*) has a slender body and a broad rounded wing, in which the second quill exceeds the rest in length ; the tail, formed of fourteen feathers, is long, broad, and much rounded ; the powerful foot is high, the beak comparatively small and straight. The colour of the head and crest is blackish brown, of the neck and shoulders dark ash-grey ; the fore part of the former, from the chin to the breast, is marked by a series of lanceolate feathers, which are black, with a white stripe down the centre ; the back and wings are conspicuously marked with three distinct bands of greyish white, brown, and black ; near the tip of each feather the marks assume an ocellate form, particularly on the tips of the secondaries. The primaries are brown, their outer webs marked with zigzag lines of darker brown ; the rump and upper tail-covers are brownish grey, the feathers of the latter transversely marked with two or three zigzag lines near their tip ; all the under surface is light buff ; the tips of the flank-feathers are barred with black ; the tail is blackish brown, broadly tipped with buff ; the bill black, and the foot blackish brown.

"The Ocellated Leipoa," says Gould, "appears to be more peculiarly suited for a plain and open country than for the tangled brush ; and it is most curious to observe how beautifully the means employed by Nature for the reproduction of the species is adapted to the situations it is destined to inhabit." The following sketches of its economy, so far as it has yet been ascertained, were given me by Gilbert and Sir George Grey, and are here reproduced in their own words :—

"Wongan Hills, Western Australia, *September 28, 1842.*

"This morning I had the good fortune to penetrate into the dense thicket I had so long been anxious to visit in search of the Leipoa's eggs, and had not proceeded far before the native who was with me told me to keep a good look out, as we were among the Ngou-oo's hillocks ; and in half an hour after, we found one, around which the brush was so thick that we were almost running over it before seeing it. So anxious was I to see the hidden treasures within that, in my haste, I threw aside the black fellow and began scraping off the upper part of the mound ; this did not please him at all, and he became very indignant, at the same time making me understand that as I had never seen this nest before, I had better trust him to get out the eggs, or I should, in my haste and impatience, certainly break them. I therefore let him have his own way, and he began scraping off the earth very carefully from the centre, throwing it over the side, so that the mound very soon presented the appearance of a huge basin. About two feet in depth of earth was in this way thrown off, when the large ends of two eggs met my anxious gaze ; both these eggs were resting on their smaller apex, and the earth round them had to be very carefully removed to avoid breaking the shell, which is extremely fragile when first exposed to the atmosphere. About a hundred yards from this first mound, we came

upon a second, rather larger, of the same external form and appearance ; it contained three eggs. Although we saw seven or eight more mounds, only these two contained eggs : we were too early ; a week later and we should doubtless have found many more. To give you an idea of the place these birds choose for their remarkable mode of rearing their young, I will describe it as nearly as I can.

“The Wongan Hills are about 1,300 feet above the level of the sea, in a north-north-east direction from Drummond’s House in the Toodyay. Their sides are thickly clothed with a dense forest of *Eucalypti*, and at their base is a thicket, extending for several miles, of upright-growing and thick bushy plants, so high in most parts that we could not see over their tops, and so dense that if we only separated for a few yards we were obliged to ‘cooey’ to prevent our straying from each other. This thicket is again shadowed by a very curious species of dwarf *Eucalyptus*, bearing yellow blossoms, and growing from fifteen to thirty feet in height, known to the natives as the spear-wood, and of which they make their spears, digging-sticks, *dowaks*, &c. The whole formation is a fine reddish iron-stone gravel, and this the *Leipoa* scratches up for several yards around, and thus forms its mound, to be afterwards converted into a hotbed for the reproduction of its offspring. The interior of the mound is composed of the finer particles of the gravel, mixed with vegetable matter, the fermentation of which produces a warmth sufficient for the purpose of hatching. Mr. Drummond, who had been for years accustomed to hotbeds in England, gave it as his opinion that the heat around the eggs was about 89°. In both the nests with eggs the White Ant was very numerous, making its little covered galleries of earth around and attached to the shell, thus showing a beautiful provision of Nature in preparing the necessary tender food for the young bird on its emergence. One of the eggs I have preserved shows the White Ant’s tracks most beautifully. The largest mound I saw, and which appeared as if in a state of preparation for eggs, measured forty-five feet in circumference, and, if round in proportion on the top, would have been fully five feet in height. I remarked that in all the mounds not ready for the reception of eggs the inside or vegetable portion was always wet and cold ; and I imagine from the state of the others that the bird turns out the whole of the materials to dry before depositing its eggs and covering them up with the soil. In both cases where I found eggs, the upper part of the mound was perfectly and smoothly rounded over, so that any one passing it without knowing the singular habit of the bird might very readily suppose it to be an ant-hill. Mounds in this state always contain eggs within, while those without eggs are not only not rounded over, but have the centres so scooped out that they form a hollow. The eggs are laid directly in the centre, all at the same depth, separated only by about three inches of earth, and so placed as to form a circle. I regret we were so early. Had we been a week later, the probability is I should have found the circle of eggs complete. Is it not singular that all the eggs were equally fresh, as if their development was arrested until the full number were deposited, so that the young might all appear at the same time? No one considering the immense size of the egg can suppose for a moment the bird capable of laying more than one without at least the intermission of a day, and perhaps even more. Like those of the *Megapodius*, they are covered with an epidermis-like coating, and are certainly as large, being three inches and three-quarters in length by two and a half in breadth. They vary in colour from a very light brown to a light salmon. During the whole day we did not succeed in obtaining sight of the bird, although we saw numerous tracks of its feet, and many places where it had been scratching. We also saw its tracks on the sand when crossing the dried beds of the swamps at least two miles from the breeding thicket, which proves that the bird in procuring its food does not confine itself to the bushes around its nest, but merely resorts to them for the purpose of incubating. The native informed us that the only chance of procuring the bird was by stationing ourselves in sight of the mound at a little distance, and remaining quiet and immovable till it made its appearance at sundown. This I attempted, and, with the native, encamped within twenty yards of the mound about an hour before sunset, taking precautions to conceal ourselves

well with bushes from the quick eye of the bird, but leaving just an opening to get a fair sight with my gun. In a half-sitting, half-crouching position, I thus remained in breathless anxiety for the approach of the bird I had so long wished to see, not daring to move a muscle for fear of stirring a branch or making a noise by crushing a dead leaf, till I was so cramped that I could scarcely bear the pain in my limbs. The bird did not, however, make its appearance, and the native, with the fear of wading through the thicket in the darkness (for there was no moon), became so impatient that he started up and began to talk so loud and make so much noise that I was compelled to give up all hopes of seeing the bird that night. However, just as we were passing the mound we started the bird from the opposite side, but, from the denseness of the thicket and the darkness closing round us, I had no chance of getting a shot at it."

Sir George Grey completes the account given by Gilbert. He says, "I have lately returned from the Murray, where I have been studying the habits and manners of the *Leipoa ocellata*, which is very plentiful in the sandy districts of the scrub. Its food consists chiefly of insects, such as *Phasmida* and a species of *Cimex*. It also feeds on the seeds of various shrubs. It possesses the power of running with extraordinary rapidity; it roosts at night on trees, and never flies if it can avoid so doing.

"The mounds it constructs are from twelve to thirteen yards in circumference at the base, and from two to three feet in height, the general form being that of a dome. The sand and grass are sometimes scraped up for a distance of from fifteen to sixteen feet from its outer edge. The mound appears to be constructed as follows:—A nearly circular hole of about eighteen inches in diameter is scratched in the ground to the depth of seven or eight inches, and filled with dead leaves, dead grass, and similar materials; and a large mass of the same substance is placed all around it upon the ground. Over this first layer a large mound of sand, mixed with dried grass, &c., is thrown, and finally the whole assumes the form of a dome, as I have before stated.

"When an egg is to be deposited, the top is laid open, and a hole scraped in its centre, within two or three inches of the bottom of the layer of dead leaves. The egg is placed in the sand just at the edge of the hole, in a vertical position, with the smaller end downwards; the sand is then thrown in again, and the mound left in its original form. The egg which has thus been deposited is therefore completely surrounded and enveloped in soft sand, having from four to six inches of sand between the lower end of the egg and the layer of dead leaves. When a second egg is laid, it is deposited in precisely the same plane as the first, but at the opposite side of the hole before alluded to. When a third egg is laid, it is still placed in the same plane as the others, but, as it were, at the third corner of a square. When the fourth egg is laid, it is still placed in the same plane, but in the fourth corner of the square, or rather of the lozenge, the figure being of this form, $\circ \begin{smallmatrix} \circ \\ \circ \end{smallmatrix} \circ$; the next four eggs in succession are placed in the interstices, but always on the same plane, so that at last there is a circle of eight eggs all standing upright in the sand, with several inches of sand intervening between each. The male bird assists the female in opening and covering up the mound, and, provided the birds are not themselves disturbed, the female continues to lay several eggs in the same mound, even after it has been several times robbed. The natives say that the females lay an egg every day. Eight is the greatest number I have heard of, from good authority, as having been found in one nest.

"The farthest point north at which I have seen the breeding-places of these birds is in Gantheaume Bay. The natives of King George's Sound say that the bird exists in their neighbourhood. I have never fallen in with its nests but in one description of country, viz., where the soil was dry and sandy, and so thickly wooded with a species of dwarf *Leptospermum* that if you stray from the paths it is almost impossible to force your way through."

Besides the above particulars, we have from Gould the following account, which he elicited

by cross-examination of several natives :—“There is only one male and one female to each mound ; they repair an old mound, and do not build a new one ; both assist in scratching the sand to the nest. The female commences laying about the beginning of September, or when the spear-grass begins to shoot. Both sexes approach the nest together when the female is about to lay, and they take an equal share in the labour of covering and uncovering the mound. After every sunrise the female lays an egg, and lays altogether from eight to ten. If the natives rob the mound, the female will lay again in the same nest, but she will only lay the full number of eggs twice in one summer. From the commencement of building until the last eggs are hatched, four moons elapse—this would give a very long period of time before the eggs were hatched. The young one scratches its way out alone, the mother does not assist it. They usually come out one at a time, occasionally a pair appear together. The mother, who is feeding in the scrub in its vicinity, hears its call and runs to it ; she then takes care of the young one as a European Hen does of its chick. When all are hatched, the mother is accompanied by eight or ten young ones, who remain with her until they are more than half grown. The male bird does not accompany them. The two sexes have different calls, that of the female is constantly uttered as she walks about the scrub with her young ones.

“The natives frequently find the nest and eggs, but they seldom see the old birds, as they are very timid and quick-sighted. They run very fast like the Emu, roost on trees, live for a long time without water, but drink when it rains. The Ocellated Leipoa is a remarkably stout compact bird, and appears when alive to have as large a body as the female Turkey, but it is shorter in the legs. Mr. Schomburghk states that an egg he took home and placed under a Domestic Hen was hatched the next day, and the young bird appeared covered with feathers, and capable of at once obtaining its own food.”

The MEGAPODES (*Megapodii*) have a large slender body, moderate-sized neck, and large head ; the broadly-rounded wing has the third, fourth, and fifth quills of equal length ; the tail, formed of ten feathers, is short and rounded ; the tarsus very strong, and longer than the long, powerful middle toe, which is armed like the rest with a formidable and slightly-hooked claw. The straight beak is usually shorter than the head, and vaulted towards its tip. The thick plumage is prolonged upon the back of the head and the region of the eye ; a large portion of the head and the throat and neck are always bare. We are indebted to Gould, Gilbert, and Macgillivray for full particulars respecting the mode of life of the Megapodes. “The habits and economy of the birds comprised in this family are,” says Gould, “both curious and extraordinary, nor are they less singular in their structure ; indeed, in my own opinion, no group of birds is more isolated. By one of our best ornithologists one species has been classed with the *Vultures*, another placed it with *Meleagres*, and a third authority considered it to be allied to the genus *Ralles*. From the colonists of Australia the three species inhabiting that country have received the trivial names of Brush Turkey, Native Pheasant, and Jungle Fowl, but to none of these birds are they in any way allied. In general appearance the *Megapodidæ* offer a certain degree of alliance to the *Gallinacæ*, but in the peculiar shape, colouring, and odour of their eggs, and in the mode in which they are incubated, they are totally different, and in some of these respects resemble the tortoises and turtles. Three species belonging to different genera inhabit Australia ; others exist in New Guinea and the neighbouring islands, and extend as far north as the Philippines.”

THE AUSTRALIAN MEGAPODE.

The AUSTRALIAN MEGAPODE (*Megapodius tumulus*) is about the size of a female Pheasant. The head of this species is dark reddish brown, the back and wing reddish brown, the upper and lower

tail-covers deep chestnut-brown, the quills and tail-feathers blackish brown, and back of the head and under side grey. The eye is light reddish brown, the beak of rather a darker shade, and the foot bright orange.

“On my arrival at Port Essington,” says Gilbert, “my attention was attracted to numerous immense mounds of earth, which were pointed out to me by some of the residents as the tumuli of the aborigines; on the other hand, I was assured by the natives that they were formed by the Megapode for the purpose of incubating its eggs. This latter statement appeared so extraordinary, and so much at variance with the general habits of birds, that no one in the settlement believed them or took sufficient interest in the matter to examine the mounds, and thus to verify or refute their accounts. Another circumstance which induced a doubt of their veracity was the great size of the eggs brought in by the natives as those of this bird. Aware that the eggs of the *Leipoa* were hatched in a similar manner, my attention was immediately arrested by these accounts, and I at once determined to ascertain all I possibly could respecting so singular a feature in the bird's economy; and having procured the assistance of a very intelligent native, who undertook to guide me to the different places resorted to by these birds, I proceeded on the 16th of November to Knocker's Bay, a part of Port Essington Harbour, comparatively but little known, and where I had been informed a number of these birds were always to be seen.” A detailed account follows of his finding several different mounds, which he examined, and was quite convinced that the natives had spoken the truth concerning them. Somewhat later, Mr. John Macgillivray observed the Megapode on Nago Island, in Endeavour Straits, and during his stay there was so fortunate as to procure both the male and the female, and to find several mounds containing eggs.

“Few birds,” says this gentleman, “are more wary and less easily procured than the Megapodius; it inhabits the belts of brush along the coast, and I never found the tumulus at a greater distance from the sea than a few hundred yards. When disturbed this species seldom rises at once, unless on the margin of a thicket, but runs off to some distance and then takes to wing, flying heavily, but without any of the whirring noise of the true *Gallinacæ*. It seldom takes a long flight, and usually perches on a tree, remaining there in a crouching attitude with outstretched neck, but flying off again upon observing any motion made by its pursuer; and it is only by cautiously sneaking up under cover of the largest trees that it can be approached within gunshot. As an example of its shyness, I may mention that a party of three persons scattered about in a jungle on Nago Island for the purpose of shooting the Megapodius did not see a single bird, although they put up several, one of which came towards me and perched, unconscious of my presence, within twenty yards. At Port Essington I have shot this bird among mangroves, the roots of which were washed by the sea at high water; and Captain F. P. Blackwood killed one while running on the mud in a similar locality, in both instances close to a mound.”

Gilbert also confirms the statement that it is found near the shore. The Megapode, he says, is almost exclusively confined to the dense thickets immediately adjacent to the sea-beach; it appears never to go far inland, except along the banks of creeks. It is always met with in pairs, or quite solitary, and feeds on the ground, its food consisting of roots, which its powerful claws enable it to scratch up with the utmost facility, and also of seeds, berries, and insects, particularly the larger species of *Coleoptera*. He did not himself detect any note or cry, but, from the natives' description of it, it much resembles the clucking of a Domestic Fowl, ending with a scream like that of the Peacock. The mounds are very different, both as regards situation, size, and composition. They usually stand near the edge of water; some are composed of sand and shell, while others contain vegetable mould and decaying wood. Gilbert found one fifteen feet in height and sixty in circumference at the base, and another which covered a space of at least a hundred and fifty feet in

circumference, and Macgillivray speaks of one of similar height and extent. It is most probable that these mounds are the work of several generations; whether each mound is resorted to by more than one pair, Mr. Macgillivray had not the means of ascertaining. "Some of them," he observes, "are evidently very ancient, trees being often seen growing from their sides. In one instance I found a tree which was a foot in diameter growing from the middle of a mound." The holes containing the eggs sometimes commence at the outer edge of the summit, and slope down obliquely, towards the centre, and sometimes run in an oblique direction from the centre towards the outer slope of the hillock. The eggs lie six feet deep from the summit, but only two or three feet from the side. "The natives," says Gilbert, "dig them up with their hands alone, and only make sufficient room to admit their bodies and to throw out the earth between their legs; their patience is, however, often put to severe trials, for they often dig down to a depth of six or seven feet without finding an egg, and are quite exhausted by their vain attempts. The eggs are placed in a perpendicular position, the larger end uppermost; they differ in size, but in form they assimilate; they are three inches and five lines long, by two inches and three lines broad. The composition of the mound appears to influence the colouring of a thin epidermis with which the eggs are covered, and which readily chips off, showing the true shell to be white; those deposited in the black soil are always of a dark reddish brown, while those from the sandy hillocks near the beach are of a dirty yellowish white. The natives affirm that the eggs are deposited at night, at intervals of several days." The exit of the young bird from the egg was not seen either by Macgillivray or Gilbert, but the latter found a young bird in a hole about two feet deep, lying on a few withered leaves, which appeared to be only a few days old. Gilbert took great care of the bird, intending to rear it, and placed it in a moderate-sized box containing a large quantity of sand. It fed freely on bruised corn, but was so wild and intractable that it would not reconcile itself to confinement, and escaped on the third day. While in captivity, it was incessantly occupied in scratching up the sand into heaps, and throwing it from one end of the box to the other with a rapidity quite surprising for so young and small a bird, its size not exceeding that of a small Quail. At night it was so noisy in its efforts to escape that its captor was kept constantly awake. In scratching up the sand it used only one foot, and having grasped a footful, threw it behind with but little apparent exertion, and without shifting its standing position on the other leg. This habit seemed to be the result of an innate restless disposition, and a desire to use its powerful feet, and to have but little connection with its feeding, for though Mr. Gilbert mixed Indian corn with the sand, he never detected the bird picking any up while so employed.

The CURASSOWS, or HOCCOS (*Cracidæ*), are large or middle-sized birds, with slender bodies, much-rounded wings in which the four or five exterior primaries are graduated, and the secondaries prolonged, and a long powerful tail either slightly graduated or straight at its extremity. The beak, which is of various lengths and comparatively shorter than that of a Pigeon, is curved at the culmen, much hooked at the tip, and covered with a cere which extends over the whole region of the nostrils, and occasionally over the cheek-stripes and the excrescences exhibited by some species at the base of the bill. The rather high and sinewy foot is furnished with long thin toes placed on the same plane, and armed with narrow, long, pointed, and slightly hooked claws. The heavy plumage is composed of large feathers, some of which are broadly rounded, and in one family have the shafts of unusual size at the root, but gradually tapering towards the extremity. One species in particular possesses this peculiarity in a high degree, these broad shafts being ten or twenty times as thick at the centre as at the tip, and from six to ten times as thick as at the base, the lower portions of these broad shafts are covered with a downy web, whilst that of the extremity is close in texture. This peculiar structure of the feathers is much developed in the hinder parts of the body, and slightly

on the wings and tail. Dusky hues predominate in the coloration of the plumage. These fine birds inhabit the forests of South America, and build their nests in trees. Like the rest of the order, they subsist upon worms, insects, fruits, and the seeds of plants. The above definition includes two distinct families—the CRACES or TRUE CURASSOWS, and the PENELOPÆ or GUANS.

The TRUE CURASSOWS, or HOCCOS (*Craces*), are powerfully-framed birds, possessing a high, much-curved beak, with compressed sides, and furnished with a cere and excrescences at its base. During the period of incubation the latter swell to a considerable size, and in one species present the appearance of a horn placed in the centre of the brow, and in another assume the appearance of a large pear-shaped excrescence. The strong foot is moderately high, and the toes rather long, the wing short, with its seventh and eighth quills longer than the rest, and the rounded tail of medium size. The plumage upon the brow and nape usually forms a comb-like crest composed of slender, stiff feathers, which incline backwards at their roots, but project forwards at their curved tips. The feathers on the cheeks, upper throat, and hinder parts are soft and downy, and those on the lower neck and rump coarse and harsh; the region of the eye is bare, and the cheeks covered with small hair-like feathers.

The members of this family occupy the forests of tropical America, where they frequent the trees, and but rarely descend upon the ground, over the surface of which, however, they can run with great rapidity; their flight is slow, horizontal, and never long sustained, and their mode of disporting themselves when upon the branches of trees, easy though slow. During the breeding season they are met with in pairs, and at other times in small parties of some three or four birds. In all the various species the voice is peculiar, but very different in tone, and is heard most frequently during the period of incubation, or in the early morning, when they first awake from sleep. The Indians maintain, and Schomburghk has corroborated the statement, that one species, the *Urax tomentosa*, always utters its cry at the moment that the beautiful constellation called the Southern Cross attains its greatest altitude. In their wild state the Hoccos subsist principally on fruit and berries of various kinds, and occasionally consume insects, worms, and portions of certain plants; to the strong odour of some of the latter is probably attributable a most unpleasant flavour occasionally observable in their flesh. We are but little acquainted with the incubation of these birds, except that they build a flat nest made of twigs interlaced and lined with leaves, and placed upon the branches at no great distance from the ground. Bates and Schomburghk are of opinion that the large white eggs are but two in number; Gray, on the contrary, states that the female lays as many as five or six. In their native forests the Hoccos exhibit no fear of man, and if attacked, seem perfectly unconscious of danger, even should they see their companions fall dead around them. When living in the vicinity of human habitations, on the contrary, they become extremely timid, and if approached, at once take wing. The Indians not only eat the flesh of these birds, but employ their strong quills and tail-feathers as fans; the small feathers are also used in various kinds of ornamental work. In different parts of America Curassows have long been domesticated, and at one time were, it is said, thoroughly acclimatised in Holland by M. Armschoff, proving in his menagerie as prolific as any of our barn-door poultry.

THE COMMON OR CRESTED CURASSOW.

The COMMON OR CRESTED CURASSOW (*Crax alector*) is nearly as large as a Turkey, being about thirty-six inches long. Its plumage is of a glossy black, and gleams with green and purple when exposed to the rays of the sun; the belly is white. The stout black beak is furnished with a large yellow cere at the base of both mandibles, and the eye is surrounded by a bare skin. The female

is black only upon the head, neck, and breast ; the feathers upon her belly are rust-red, and those of her wings and legs marked with reddish yellow.

This fine bird is common in Brazil, from Guiana to Paraguay, and is called "Powese" by the natives on account of its cry, which is said to resemble that word. Its flesh is much valued and forms an important article of food to the planters. In their native woods these birds exhibit little fear of man, but become more cautious when in the vicinity of human habitations ; they are readily tamed,



THE CRESTED CURASSOW (*Crax alector*). ONE-QUARTER NATURAL SIZE.

however, and are constantly kept by the natives as domestic pets. Sonnini mentions having seen them, when in Guiana, running freely about in the streets and entering the houses to obtain food ; at night they slept on the house-tops or similar situations, and Bates gives an interesting account of a fine specimen that he saw running about a house quite like one of the family. It attended at all the meals, and passed from one person to another round the table to be fed, attracting the attention of the guests in a coaxing manner by rubbing its head against their cheeks and shoulders. At night it slept on a chest close to the hammock of a little girl to whom it was particularly attached, and followed her about the grounds in all her walks like a dog.

THE WATTLED CURASSOW.

The WATTLED CURASSOW (*Crax carunculata*) is distinguishable from the species last described by the inferiority of its size, and the red hue of its cere. The plumage of the male is black, with the exception of the white belly and wings. The eye is brown, the tip of the beak black, the cere red, and the foot yellowish red. The female has part of her throat and breast spotted with white, and the wings and upper part of the belly and legs with reddish yellow, the rump and lower portions of the belly are brownish red. The length of this species is thirty-four inches and the breadth forty-seven inches, the wing measures fourteen and the tail thirteen inches and a half. The Wattled Curassow inhabits the forests on the eastern coasts of Brazil, and is met with from Rio de Janeiro to Bahia.

THE RED CURASSOW.

The RED CURASSOW (*Crax rubra*) is at once recognisable by its beautiful chestnut-brown plumage; the feathers on the nape and part of the throat are striped black and white, and those that form the tail adorned with yellowish white lines edged with black. The eye is reddish brown, the beak horn-grey, the cere blueish black, and the foot lead-grey.

This species is about two feet and six or eight inches long. It has a large strong bill, and a crest composed of twisted and curled feathers, tipped with black at their broad extremities. The Red Curassows inhabit Mexico, Peru, and the West Indian Islands. They are easily tamed, and associate freely with other poultry; this accounts for mongrel birds being often seen that differ much from the parent stock. In their native wilds they are by no means shy, and will suffer themselves to be shot at many times before they attempt to escape.

THE GALEATED CURASSOW.

The GALEATED CURASSOW (*Urax pauxi*) is characterised by the large, pear-shaped excrescence situated above the nostril, its thick, curved beak, which is vaulted from its base to the tip, and the absence of a crest upon its head. The plumage is principally of a glossy blackish green, with white upon the belly and tip of the tail; the eye is reddish brown, the beak red, the excrescence on the beak blueish black, and the foot light red. The windpipe of this bird is much elongated, and after continuing down the whole length of the pectoral muscle, forms a loop and ascends again before entering the chest.

The Galeated Curassow is met with in flocks in the Mexican forests, where it perches in the trees, but makes its nest upon the ground. The mother leads forth her young in the same manner as a Hen, and feeds them at first with worms, insects, and larvæ, but at a later period they subsist upon grain and berries. This species is easily domesticated, and was one of those which bred in Holland in M. Armschoff's menagerie.

THE MOUNTAIN CURASSOW, OR LORD DERBY'S GUAN.

The MOUNTAIN CURASSOW, OR LORD DERBY'S GUAN (*Oreophasis Derbyanus*), must be regarded as the connecting link between the *Craces* and *Penelopæ*. This bird, with which we are but little acquainted, has an elongate but powerful body, short neck, and comparatively small head. In the small abruptly-rounded wings, the sixth quill exceeds the rest in length; the tail is long, graduated, and but slightly rounded at the tip. The feathers composing the tail and pinions are of unusual breadth, and those forming the latter have a decided curve inwards. All the smaller feathers are downy as far as their centre, with large shafts; those of the rump-feathers being remarkably thick. The plumage of the throat is of a velvety texture, but assumes a hairy appearance lower down, whilst

that upon other parts of the body is broad-webbed, compact, and harsh. The slender beak is almost covered with velvety feathers forming a tuft above the upper mandible, which curves slightly over the lower portion of the bill and has a broad tip. The short foot is furnished with long toes and large curved claws. The tarsi and skin between the outer and middle toes are feathered. The centre of the brow is in this species decorated with a slender horn, which inclines forward at the extremity. The plumage of both sexes is glossy black, shaded with green upon the back, wings, and belly; the gullet and breast are whitish grey, each feather being striped with blackish brown upon the shafts; the ornamentation of the tail is enlivened by a greyish white stripe about an inch in length. The eye is white, the beak pale straw-colour, the horn scarlet, and the foot bright red. The length of this species is thirty inches; the wing measures fourteen inches, and the tail fourteen inches and a half.

The first specimen of the Mountain Curassow seen in Europe was killed by a Spaniard in 1848, and came into the possession of Earl Derby, after whom it was named. This rare species appears to be met with only on the Volcan del Fuego, a mountain in Guatemala which is covered at an altitude of 7,000 feet above the sea with high trees, among the branches of which it seeks its food during the morning hours, but later in the day it descends into the underwood or reposes upon the ground. Its habits probably resemble those of its congeners, but we are without any other details as to its mode of life.

The GUANS (*Penelopæ*) are distinguishable from the Curassows by their slender body, comparatively long, much-rounded tail, and low tarsus. They have a broad cere upon their beak, and a bare patch around the eye; their almost naked throat is only covered with a long hairy growth, and there is a slight crest upon the head. The upper plumage of these birds is usually of a uniformly dusky metallic green or brown, while many of the feathers on the under side and breast have light borders. The various members of this family are only found in the warm parts of South America, and closely resemble each other in their mode of life and habits. They usually frequent trees, near the tops of which they perch during the heat of the day, only descending to seek for fruit and insects at early morning or in the evening. Owing to the shortness of their wings their flight is heavy and performed with difficulty; on the branches they are more adroit, and if alarmed move with extraordinary rapidity; in disposition they are shy and usually remain concealed among the thickest foliage, from whence they peep forth to reconnoitre and keep a strict watch against approaching danger. The larger species are solitary in their habits, whilst the smaller members of the family associate in large parties, often numbering sixty or seventy individuals, and fly about under the guidance of one bird placed at the head of the flock. The harsh, loud, peculiar voices of the *Penelopæ* are usually heard most frequently at break of day, and are represented by travellers as producing an almost deafening effect, when, as is generally the case, a whole flock, following the example of their leader, join together in chorus. Fruit, seeds, and berries of various kinds afford these birds the means of subsistence; it would also appear, according to the Prince von Wied, that they do not reject insect diet. The nests are usually built in trees, and only occasionally on the ground. The large white eggs are from two to six in number. It is at present uncertain whether both parents assist in tending their offspring. Bajon informs us that as soon as the young quit the shell they commence climbing about in the underwood, and are fed in the nest; when strong enough, they venture on to the ground, follow their mother like young chickens, and are led about by her in the short grass during the early morning; when fully fledged they go forth into the world on their own account, and the parents probably proceed to rear another brood. Some species only leave the nest when about ten or twelve days old. Amongst the Indians these birds are highly prized as

domestic favourites, and soon become so tame as to enjoy being caressed and taken in the hand. Their flesh is also much esteemed.

THE SUPERCILIOUS GUAN.

The SUPERCILIOUS GUAN (*Penelope superciliaris*) represents a group recognisable by their comparatively large size, moderately long tail, and soft plumage, as also by the small crest upon their head, and the absence of feathers on the brow, sides of the neck, and throat. Upon the crown, nape, throat, and breast, the plumage of this species is of a slaty black, shaded with grey; each of the feathers edged with a whitish line, while those of the back, wings, and tail are metallic green, bordered with whitish grey and reddish yellow; the feathers on the belly and rump are brown and yellowish red, and the quills delicately edged with greyish yellow. A whitish brown stripe passes above the brown eye, which is surrounded by a bare patch of black skin; the bare throat is deep flesh-red; the beak greyish brown; and the foot dusky reddish brown. The female is recognisable from her mate by the comparative indistinctness both of the stripes above the eye and the light borders to the feathers. The young are principally of a pale greyish brown, with a reddish yellow line over the eye, and are delicately marked with undulating lines upon the breast, rump, and leg feathers. This bird is twenty-four inches long; the wing measures ten, and the tail ten and a half inches.

The Supercilious Guan is an inhabitant of Brazil, and is particularly numerous in the district of Para: it is called by the Indians "Jack-peva."

THE PIGMY, OR PIPING GUAN.

The PIGMY, OR PIPING GUAN (*Pipile leucolophos*), represents a group distinguishable from the above birds by their low tarsi, the slender, sickle-shaped form of the three first wing-quills, the slender, erect, and pointed crest, about three inches long, that adorns their head, and the black, bristle-like growth that covers the cheeks and overspreads the throat in small tufts. The upper portion of the body is principally slate-black, with white outer wing tipped with spots of the same dark shade; the lower part of the back, under breast, belly, and vent are reddish brown; some parts of the throat and breast have a chequered appearance, owing to the white edges of the feathers. The crest is composed of pure white feathers with black shafts; the quills and tail are black, enlivened by a steel-blue sheen; the eye is a deep cherry-colour; the bare face light blue; the throat light red; the beak horn-black, with bright blue base; and the foot red. The female is not so large as her mate, and has a shorter crest, less decided tints, and broader white edges to her feathers. The plumage of the young is dusky brownish black, except on the reddish brown belly and rump; their crest is but slightly developed. This bird is twenty-nine inches long and thirty-nine broad; the wing measures nearly eleven, and tail ten inches and three-quarters. Schomburghk mentions that he met with the Piping Guan in all parts of British Guiana, and saw it in great numbers in the forests near the coast. It is less bold than its congeners, and unlike them, according to the Prince von Wied, builds its nest amongst the branches of the forest trees in which it lives in pairs. Its flesh is excellent, and it is readily tamed. The voice of this species is low and piping.

THE ARACUAN.

The ARACUAN (*Ortalia Aracuan*) and its congeners are smaller than the above birds, with longer tails, and tarsi as long as the centre toe. In the wing the outer primaries are rounded at the tip, and the fifth, sixth, and seventh quills longer than the rest. The cheeks and sides of the throat are bare, the latter divided by a narrow feathered stripe. The plumage, which is composed of soft

and rounded feathers, is principally of an olive-brown on the upper portion of the body, with a somewhat redder shade on the crown of the head, and white edges to the feathers on the breast and fore part of the throat; the three outer tail-feathers are tipped with brownish red. The eye is deep brown, and the bare patch that surrounds it blueish black; the unfeathered portions of the throat are flesh-red; the beak light red; and foot pale flesh-red. The female differs but slightly from her mate;



THE HOACTZIN, OR STINK BIRD (*Opisthocomus cristatus*).

the young exhibit much paler tints than the parent birds. This species is twenty inches and a half long, and twenty-three inches and a quarter broad; the wing measures seven and the tail nine inches.

The Aracuan is an inhabitant of Central Brazil, where it is principally met with in the forests of Bahia.

THE HOACTZIN, OR STINK BIRD.

The HOACTZIN, or STINK BIRD (*Opisthocomus cristatus*), the only representative of the tribe to which it belongs, has a slender body, moderately long neck, and wings that extend to about the centre of the tail, which is composed of ten long, broad feathers, graduated at its sides and rounded at the extremity. The bill, which resembles both that of the *Craces* and of the *Penelopæ*, curves over

its lower portion at the tip, is covered with a cere at its base, and is slightly incised at its margins. The tarsi are short, and the long toes, which are not united by a skin, are armed with large, curved, and very sharp claws. The plumage is prolonged upon the head and nape into a long flowing crest, the feathers of which, like those on the neck, are narrow and pointed, while such as cover the rump are large and rounded. The plumage on the belly is almost downy in texture, and that of the back is coarse and harsh. The nape, back, wings, and portion of the quills and the tail are brown, the hinder quills enlivened by a metallic green gloss, and the feathers on the wing-covers whitish, the belly, part of the legs, rump, primary quills, and outer portions of the secondaries are light rust-red. The crest is whitish yellow, partially tipped with black, the eye light brown. The bare part of the face is flesh-pink, the beak greyish brown, with a light tip, and the foot reddish brown. This species is twenty-four inches long; its wing measures thirteen, and tail eleven inches.

The Hoactzin is peculiar to the northern parts of South America, and is common in the thickets and forests near Cameta, not far from the junction of the Talantias with the Para. "In this remarkable bird," says Bates, "the hind toe is not placed high above the level of the rest, as it generally is in the Rasorial order, but lies in the same plane with them, and the shape of the foot thus becomes adapted to the arboreal habits of the bird. This, indeed, may be said to be a distinguishing character of all the birds in equinoctial America that represent the Fowl and Pheasant tribes of the Old World.

"This species lives in considerable flocks on the low trees and bushes bordering streams and lagoons, and feeds on various wild fruits, especially the sour guava (*Psidium*). The natives say it devours the fruit of arborescent arums (*Caladium arborescens*), which grow in crowded masses around the swampy banks of lagoons. Its voice is a harsh grating hiss; this noise is uttered when the birds are alarmed, all the individuals sibilating as they fly heavily away from tree to tree. The *Opisthocomus* is polygamous, like other members of the order to which it has been assigned. It is never, however, by any chance, seen on the ground, and is nowhere domesticated. The flesh has an unpleasant odour of musk combined with that of wet hides, a smell called by the Brazilians *catanga*, and it is therefore uneatable. If it be as unpalatable to carnivorous animals as it is to man, the immunity from persecution which this bird would thereby enjoy would account for its existing in such great numbers throughout the country."

The Hoactzin is by no means shy, and will allow the hunter to approach very near. If alarmed at the report of a gun, the whole flock take flight crying "cra, cra," and all alight close to each other on the branches of some tree a few paces further off. The strong and most unpleasant odour emitted by the bodies of these birds is supposed to be imparted by the leaves of the trees on which they principally subsist. So powerful is the musky smell thus acquired that the natives employ the flesh as bait for certain fishes. Schomburghk is inclined to doubt whether this strong odour is to be thus accounted for, and tells us that stuffed specimens retain their disagreeable scent for several years. The very loosely-constructed nest of the *Opisthocomus* is placed in low bushes near the water; the eggs, three or four in number, are greyish white, spotted with red; in shape they resemble those of the *Penelopæ*, whilst the markings are similar to those of the Rails.

The TINAMOUS (*Crypturidæ*), as the birds belonging to the last division of this order are called, constitute a group of very remarkable South American species, recognisable by their powerful bodies, long thin neck, small flat head, and long, slender, curved bill. The tarsus is long, the sole of the foot rough, and the small hinder toe, which is placed high up, is in some instances so short as to be nothing more than a claw. The feathers on the head and throat are small, whilst those on the rump are large, broad, and strong. The short rounded wings have the fourth or fifth of their

slender and pointed primaries longer than the rest; the tail is composed of ten or twelve narrow feathers, so short as to be concealed by the long tail-covers, or in some instances they are entirely wanting. The sexes are alike both in their coloration and general appearance. These birds inhabit a large portion of South America, and frequent the most various situations, open plains, dense thickets, or mountain regions; each have their appointed occupants: whilst some are met with exclusively at an altitude of more than 2,000 feet about the level of the sea. Their flight is heavy, and is but seldom resorted to as a means of escape; upon the ground they run with great rapidity, somewhat after the manner of a Quail, and if disturbed, at once crouch down or conceal themselves amongst the long grass. Such species as frequent forests pass the night upon the lower branches of trees. Their voice consists of a series of deep and high piping notes, uttered by some during the day, and by others only when seeking their roosting-place for the night or early in the morning. The intelligence of the *Crypturidæ* is very limited, and if alarmed they appear to become almost stupefied. Of one species Mr. Darwin tells us that a man on horseback, by riding round and round so as to approach nearer each time, may knock as many on the head as he pleases. The more common method is to catch them with a running noose or little lasso, made of an ostrich-feather fastened to the end of a stick; a boy on a horse will frequently thus catch thirty or forty in a day. Guns, dogs, and snares are also employed in their capture, owing to the length of the grass in which they take refuge. European dogs, even if well trained, are not of much value in their pursuit; the Indian dog, on the contrary, Tschudi informs us, seldom fails to seize the game. Fruits, portions of leaves, insects, and seeds, constitute the food of these birds, and to the bitter taste of some of the latter is probably to be attributed a peculiar, disagreeable flavour occasionally observable in their flesh. We are at present without reliable information respecting their incubation, beyond the facts that they make a slight nest upon the ground, and are usually seen in pairs. The eggs are of uniform hue, with a beautifully bright gloss on the shell. The young only remain for a short time under their mother's care, and, as with the Quails, soon wander forth to obtain their own subsistence. Schomburghk mentions having seen these birds kept and tamed in the huts of the Indians, but pronounces them to be very uninteresting favourites.

THE TATAUPA.

The TATAUPA (*Crypturus Tataupa*) represents a division of the above birds recognisable by their powerful body, short pigeon-like neck, moderately large head, and slender, slightly-curved beak, which exceeds the head in length, and is much flattened towards the lower part of the culmen. The first quill in the short wing is very small, and the fourth longer than the rest; the tail-feathers are entirely wanting, and the foot, which is of moderate height, has the hinder toe but slightly developed. The rich, dark plumage is grey upon the head, throat, and breast, whilst the back, wings, and tail-covers are reddish brown, and the rump-feathers black or deep brown edged with white and yellow. The eye is reddish light brown, the beak coral-red, and the foot flesh-brown. The length of this species is nine inches and a half, and its breadth fifteen inches; the wing measures four inches and three-quarters. The female bird is scarcely distinguishable from her mate in the coloration of her plumage, whilst the young are at once recognisable by the dull brownish grey feathers on their head, throat, and under side, and the deep greyish yellow hue of the belly, which is distinctly spotted with a darker shade. The Tataupa is met with in portions of Eastern Brazil, and is especially numerous in some parts of Bahia. According to the Prince von Wied it prefers open quarters to forest land, and runs with great rapidity over the ground. Towards evening it utters a very peculiar cry, consisting of two long-sustained notes, followed by six or eight of the same tone, but short and quickly repeated. In their other habits they resemble the Tinamous. The nest is made on the ground, the eggs are about the size of those of a Pigeon, and, according to Brehm, of a glossy, pale-chocolate hue. The

flesh of the Tataupa is much esteemed as an article of food ; when cooked it is white and almost without fat.

THE INAMBU.

The INAMBU (*Rhynchotus rufescens*) represents a group recognisable by their great size, powerful body, long neck, small head, and slender, slightly-curved beak, which exceeds the head in length, and is bluntly rounded at its extremity. The wings are short and vaulted, with pointed primaries, of which the first is very small and the fourth the longest. The foot is high and furnished with long front toes and a well-developed hinder toe. The plumage, which upon the cheeks and bridles is



THE INAMBU (*Rhynchotus rufescens*). ONE-QUARTER NATURAL SIZE.

composed of remarkably small feathers, is principally of a reddish yellow, the region of the throat being of a whitish hue, and the crown of the head streaked with black. The feathers on the back, wings, and tail-covers are also striped with black, and have two broad black lines above their yellow border. The primaries are of uniform bright yellowish red, and the secondaries grey, marked with undulating black and grey lines. The eye is yellowish brown ; the beak brown with a pale yellowish brown base to the lower mandible, and the foot flesh-brown. The length of this species is sixteen inches ; the wing measures eight inches.

The Inambu is an inhabitant of Central Brazil, being specially numerous in St. Paul's, Southern Minas, and Goyaz : Darwin met with it in the sterile country near Bahia Blanca, where it frequented swampy thickets on the borders of lakes. According to that naturalist it lies low and is unwilling to rise, but often utters a very shrill whistle whilst on the ground. The flesh when cooked is quite white:

The Inambu is a constant object of pursuit to the sportsman, and to this fact is no doubt attributable the shyness it exhibits at the approach of danger ; if alarmed it at once seeks shelter in the grass, and only has recourse to its wings if sorely pressed. Occasionally, but rarely, these birds are met with associated in considerable numbers. According to Burmeister they fly about during the twilight hours, and make their nest in a thick bush. The eggs, from six to eight in number, are of a very glossy dark grey colour shaded with violet.

The AMERICAN QUAILS (*Nothura*) are a race of small birds that nearly resemble the European Quail in their general appearance, and like it make their homes in the long grass of open pastures. The plumage of this group is thick, composed of long narrow feathers, and the beak is short and much hooked at its extremity. The first wing-quill is very short, the second comparatively large, and the fourth longer than the rest. The tail-feathers, which in some species are of remarkable size, are soft in texture ; the foot is strong, and the hind toe moderately developed. These timid birds inhabit South America, frequenting both the open grassy plains that border the large rivers, and the barren tracts of the warmer portions of the continent. If alarmed they conceal themselves in bushes, or crouch close to the ground and do not readily have recourse to their wings. Insects and small fruits constitute their means of subsistence.

THE LESSER MEXICAN QUAIL.

The LESSER MEXICAN QUAIL (*Nothura nana*) has the plumage on the back of a greyish yellow ; the breast whitish yellow, and the throat pure white. The feathers on the back are striped with black and edged with pale grey at the sides ; the head and nape are spotted in stripes, and the side and belly transversely striped. The tail-covers of the male bird are covered with long, downy feathers, which form a flowing train. This species is six inches long and nine inches and half broad. The female is about an inch shorter than her mate.

This Quail inhabits the grassy plains of Paraguay, and is by no means so rare as has been supposed. Owing to the shyness of its habits, it is frequently overlooked by sportsmen, as, if alarmed, it lies concealed in the long grass, only rises on the wing when danger is close at hand, and flying to a short distance, again seeks shelter ; if once more disturbed we are told it does not again quit its hiding-place ; and, according to Azara, will even allow itself to be taken with the hand rather than leave its cover. As the breeding season approaches it becomes more lively, and utters a penetrating cry.

THE MACUCA.

The MACUCA (*Trachypelmus Brasiliensis*) represents a division of the *Crypturidæ* possessing well-developed tail-feathers. The characteristics of this group are powerful bodies ; short thin necks ; small heads ; strong, arched, and much-rounded wings, in which the fifth quill exceeds the rest in length ; a moderately short, slightly-rounded tail, which is entirely concealed beneath the feathers of the upper covers ; and strong feet, furnished with short, slightly-rounded toes. The hinder toe is very small, and placed high. Upon the back the plumage is reddish brown, marked with undulatory black lines ; the breast and belly are yellowish grey ; the leg-feathers have dark markings, and each side of the throat is decorated with a reddish yellow line. The plumage of the Macuca is reddish brown, broadly marked with black upon the back ; the belly and breast are of paler hue, and more delicately striped ; the throat is whitish, and the sides of the neck mottled with black and white. The eye is greyish brown ; the beak dark brown above, light grey at its sides ; and the foot lead-colour. This species is eighteen inches and two-thirds long, and thirty-one inches broad ; the wing measures seven, and the tail four inches.

The Macuca, we learn from the Prince von Wied, inhabits the large forests of the warmer portion of South America. It runs with facility, and passes the day in searching for fruits and berries upon the ground. As night approaches it rises, with a very peculiar rustling of its wings, on to the branches of the trees. The cry of this species is deep, dull, and resonant, and is heard most frequently in the early morning and evening. The stomachs of some specimens examined by the above naturalist contained red berries, large hard fruit, and the remains of beetles and insects, together with gravel and small stones.

The same authority states that the Macuca lays nine or ten large eggs, of a blueish green colour, which are deposited in a slight depression in the ground, about September, and that the females brood with so much zeal that upon several occasions they allowed themselves to be seized by his dogs rather than desert their little family. The flesh of the Macuca is highly esteemed, and consequently this bird is an object of ardent pursuit to the sportsman, who sometimes allures it by imitating its cry. A great variety of snares are also employed for its capture by night.

The SPUR-FOWLS (*Galloperdices*) seem to constitute a distinct group, remarkable on account of the formidable character of their spurs, and the richness and variety of their colours, as exemplified in

THE PAINTED SPUR-FOWL.

The PAINTED SPUR-FOWL (*Galloperdix lunulosa*)—See Coloured Plate XXXI. In this beautiful species the male has the head, face, and neck variegated with black and white, the feathers being black, with white streaks and triangular spots, the head mostly black; the upper plumage and wings rich chestnut, with white spots on the back, sides of the neck, shoulders, and wing-covers; primaries earthy brown, tail dark sepia-brown, glossed with green in old birds; beneath, the throat and neck are variegated black and white, changing on the neck to ochreous buff, with small triangular black marks, which disappear on the abdomen; the flanks, thigh-covers, and under tail-covers dull chestnut. Bill blackish, orbits and irides red-brown, legs horny brown. Length, thirteen inches, wing six, tail five, tarsus one inch and a half.

These birds are found in Southern India, in the jungles of the Eastern Ghauts, and upon the Hill country in the vicinity of those mountains. They have been taken in the neighbourhood of Pondicherry and the Ghauts, near Bellary, Cuddapah, and Hyderabad; in Bengal and the Himalayas they are unknown. They are generally associated in small flocks, keeping to the low shrubs and brushwood, and seeking their food among fallen leaves and low herbage. Jerdon kept several individuals for a long time, but found them too pugnacious and quarrelsome for domestication. Their tail is carried erect, like that of the Jungle Fowl. A fine specimen of this species was brought to the Zoological Gardens, London, where its beauty and vivacity attracted general admiration.



SHORT-WINGED CURSORIAL BIRDS (*Brevipennes*).

THIS order comprises a number of remarkable birds, conspicuous among which are the OSTRICHES, with wings so strangely disproportionate to the size of their bodies as to have given rise to many strange fables amongst the Eastern nations concerning their origin. In North-eastern Asia the legend runs that these huge birds, inflated with pride at their superior size and strength, looked down upon their feathered companions with contempt, and, desirous of exhibiting their powers of flight, upon one occasion made a vain attempt to reach the sun. Phœbus, angry at such presumption, punished their temerity by singeing off their wings, and thus causing them to fall heavily to earth. In so doing they struck their breasts violently upon the ground, and received a mark that, together with the shortness of their pinions, has been reproduced through all successive generations, as a terrible warning against vainglorious aspirations.

Another and more ancient fable represents the Ostrich as the offspring of the camel and some strange feathered occupant of the desert.

The members of this order are birds of great size, with rather short, blunt beaks, in which the orifices of the nostrils are placed at a short distance behind the tip. In one family, however, the bill is comparatively long and slender. The head is moderately large, the neck very long, and the body exceedingly powerful; the wings are extraordinarily short, while the legs, on the contrary, are long and muscular; the large strong foot is furnished with two, three, or four toes. The feathers and quills of the tail are undeveloped, and the rest of the plumage is so lax as to have somewhat the appearance of hair. The sight and hearing of the BREVIPENNES is excellent, but their senses of taste and feeling very deficient. All are shy and cautious in their habits, but on the approach of danger they exhibit but little sagacity in their wild attempts at flight. Amongst themselves they live at peace, except during the period of incubation, and when in captivity show themselves to be almost incapable of attachment.

Africa produces one, America three, and Oceania no fewer than nine species of these birds, whilst in Europe and Asia they are unrepresented. Everywhere they occupy dry, sandy plains or tracts covered with scanty vegetation, and wander over these dreary wastes, either alone or in flocks, in search of the plants and small creatures upon which they subsist. Although not actually voracious in their appetites, no substance, however indigestible, seems to come amiss to them, and a variety of objects are frequently swallowed that their stomachs utterly reject. The incubation of these birds is very remarkable. Some are monogamous, others polygamous; but in all cases, or at least with few exceptions, the male usually undertakes all the parental duties, and behaves in every respect as a "mother" to the young, whilst the female, after depositing her eggs, exhibits but slight interest in her progeny.

THE OSTRICH.

The OSTRICH (*Struthio camelus*) is at once recognisable by its very powerful body, long and partially bare throat, and small flat head. The moderately long, depressed, and straight bill is rounded at its extremity, and has the open longitudinal nostrils prolonged nearly half-way down the beak. The large brilliant eyes are protected by lashes, and the open uncovered ears lined with a hairy growth. The long legs are bare or only overspread with a few bristles on the thighs, while the tarsi are covered with large scales, and the feet furnished with but two toes: the innermost of which

is armed with a large, broad, blunt claw. The wings are furnished with waving plumes, and two bare shafts, not unlike porcupine's quills. In this bird the sternum has no keel, but is simply convex, shield-like, and covered with a callous pad or elastic cushion, having a hard rough surface unclothed



THE OSTRICH (*Struthio camelus*).

with feathers, on which the birds support their bodies when reposing on the ground. The thick curly plumage differs in its coloration according to the sex of the bird. In the male the small rump-feathers are coal-black, the flowing wing and tail feathers of a dazzling whiteness. The colour of the female is a brownish grey, mingled with dirty white. The young resemble the mother after the first moulting. The height of the fully-grown male is eight feet, and his length from the tip of the beak



Plate 25. Cassell's Book of Birds

HASTINGS TRAGOPAN — CERIORNIS MELANOCEPHALUS

(one third Nat. size)



to the end of the tail at least six feet ; the weight of the body is about one hundredweight and a half. These large and remarkable birds inhabit the vast deserts and barren steppes of Southern Africa, and were formerly far more numerous than they are now. Lichtenstein, who wrote at the commencement of this century, mentions having seen flocks containing as many as 300 individuals in the country near the Cape, but at the present day they are usually met with in small families, consisting of but one male and from two to four females. In such countries as are not subjected to any violent changes of temperature, they remain from one year to another within a certain limited district, provided it affords them ample means of subsistence, and a large supply of water, which is indispensable. As regards the development of their senses, these birds are very unequally gifted ; their power of sight is extensive, whilst their taste and hearing are comparatively deficient. The cry of the Ostrich, which is often uttered at night, is a loud, dolorous, and stridulous sound, and in the stillness of the desert plains may be heard to a great distance. Some have compared it to the roar of the lion, but Dr. Tristram, from whom we borrow the following account of the habits of this bird, describes it as more like the hoarse lowing of an ox in pain. The note of the Ostrich during the day or when feeding he describes as being very different—a sort of hissing chuckle. The beauty of its wings and tail-feathers, which are as highly prized by the Bedouins for the decoration of tombs and of the tents and spear-heads of their sheikhs as they are for head-dresses among Western nations, have caused its chase to be a favourite employment of all desert tribes, and good skins fetch very high prices in the native markets. This bird never approaches settled habitations, and very rarely cultivated lands ; it usually selects an open space where it is safe from surprise, and where by its fleetness it “scorneth the horse and his rider.”

“The capture of the Ostrich is the greatest feat of hunting to which the Arab sportsman aspires, and in richness of booty it ranks next to the plunder of a caravan. So wary is the bird, and so open are the vast plains over which it roams, that no ambuscades or artifices can be employed, and the vulgar resource of dogged perseverance is the only mode of pursuit. The horses to be employed undergo a long and painful training : abstinence from water and a diet of dry dates being considered the best means for strengthening their wind. The hunters set forth with small skins of water, strapped under their horses’ bellies, and a scanty allowance of food for four or five days distributed judiciously about their saddles. The Ostrich generally lives in companies of from four to six individuals, which do not appear to be in the habit, under ordinary circumstances, of wandering more than twenty or thirty miles from their head-quarters. When descried, two or three of the hunters follow the herd, at a gentle gallop, endeavouring merely to keep the birds in sight without alarming them or driving them at full speed, when they would soon be lost to view. The rest of the pursuers leisurely proceed in a direction at right angles to the course which the Ostriches have taken, knowing by experience their habit of running in a circle. Posted on the best look-out they can find, they await for hours the anticipated route of the game, calculating upon intersecting their path. If fortunate enough to detect them, the relay sets upon the now fatigued flock, and frequently succeeds in running one or two down ; though a horse or two generally falls exhausted in the pursuit.”

The Ostrich when once taken offers no resistance beyond kicking out sideways. Its speed has been calculated, by Dr. Livingstone, at twenty-six miles an hour, and yet the South African Ostrich is smaller than the northern species ; Dr. Tristram, who, in the Sahara, measured the stride of the latter when bounding at full speed, found it to be from twenty-two to twenty-eight feet. If Dr. Livingstone’s calculation be at all correct, the speed of the Ostrich is unequalled by any other cursorial animal. Portions of plants, grass, seeds, and insects form the principal food of these birds, but nothing that they can by any possibility swallow seems to come amiss to them ; even should the

object be of such a nature as to be utterly indigestible by their stomachs. Brehm mentions that upon more than one occasion his bunch of keys was thus appropriated by an Ostrich, and cites an instance in which a great variety of small articles made of metal, such as coins, keys, nails, and bullets, together with a considerable quantity of gravel and pebbles, were found upon dissection in the stomach of a single individual. Small quadrupeds and birds they also enjoy amazingly, and an authority, quoted by Brehm, affirms that one of these voracious creatures that was kept about a farmhouse, entered the yard, and seeing a fine brood of ducklings running about after their mother, coolly swallowed them one after the other with no more ceremony than if they had been so many oysters. Nor is the thirst of these birds less remarkable, for Anderson assures us that when engaged in drinking they seem so engrossed as to have neither eyes nor ears for anything around them; day by day the same spot is visited in order to obtain water, until regular beaten tracks are formed, that have often misled travellers in the African desert, and caused them to imagine they had discovered the footprints of man. The female Ostrich deposits her numerous eggs in a shallow hollow in the sand, only a few inches deep, but about one yard in diameter; round this a slight wall is scraped together, and against it the numerous eggs are placed upon end, in such a manner as to occupy the least possible space. Several females lay in the same spot, so that it is not uncommon to find as many as thirty, or, according to Livingstone, as forty-five eggs in one nest. During the night the male bird broods, whilst in the daytime the eggs are covered with sand and left exposed to the sun's rays for hours at a time. Several eggs usually lie scattered around the nest; these are supposed to be intended as food for such of the young as first emerge from the shell. Solitary eggs are also left lying at random all over the country, and are named by the Bechuans 'losetla.' It is from this habit, most probably, that want of parental instinct is laid to the charge of the Ostrich; moreover, it is certain that when surprised by man with their young, before the latter are able to run, the parent bird usually scuds off alone and leaves its offspring to their fate. To do otherwise would be self-sacrifice, as it is aware of its inability to defend itself or its poults, and on the open desert it cannot, like other cursorial birds, mislead the pursuer or conceal its brood in herbage. The young are hatched in six or seven weeks, and make their appearance covered, not with feathers, but with a bristle-like growth, somewhat resembling the prickles on the back of a hedgehog. From the day they quit the shell, they not only run easily, but are fully competent to pick up their food from the ground, and within a fortnight are entirely self-dependent." The following anecdote illustrative of the affection occasionally displayed by the Ostrich for its little family is given by Anderson, who was an eye-witness on the occasion, he and his friend, Mr. Galton, having come upon a male and female escorting a brood of young ones of about the size of Barn-door Fowls:—"The moment the parent birds became aware of our intention, they set off at full speed, the female leading the way, the young following in her wake, and the cock, though at some little distance, bringing up the rear of the family party. It was very touching to observe the anxiety the old birds evinced for the safety of their progeny. Finding that we were quickly gaining upon them, the male at once slackened his pace and diverged somewhat from his course; but seeing that we were not to be diverted from our purpose, he again increased his speed, and with wings drooping so as almost to touch the ground, he hovered round us now in wide circles, and then decreasing the circumference till he came almost within pistol-shot, when he abruptly threw himself on the ground, and struggled desperately to regain his legs, as it appeared, like a bird that has been badly wounded. Having previously fired at him I really thought he was disabled, and made quickly towards him, but this was only a *ruse* on his part, for on my nearer approach he slowly rose, and began to run in an opposite direction to that of the female, who by this time was considerably ahead with her charge."

The eggs of the Ostrich are of an oval shape, and have a thick, glossy, yellowish white shell,

marked with pale yellow. According to Hardy the weight of one fully equals that of twenty-four of the eggs laid by the Domestic Fowl. To travellers in the African deserts these huge eggs form a convenient and portable provision; their flavour is excellent, and the shell so thick that they keep perfectly fresh for a fortnight or three weeks. Tristram mentions having found Ostrich egg omelette a most valuable addition to his desert bill of fare. When two months old the young acquire a plumage similar to that of the adult female; this is retained by both sexes for two years, when the male exhibits black feathers and has attained his full size and strength. The young Ostrich is easily domesticated, and is often kept by the Arabs, living freely with the goats and camels, and showing no disposition to escape. In some villages they are a sort of public property and live in the bazaars, levying contributions for themselves from the fruit-stalls.

The Romans highly esteemed the flesh of the Ostrich, and the pseudo-Emperor Firmius is said to have devoured an entire bird at one meal; the brain was regarded as a choice delicacy, and to provide the Emperor Heliogabalus with a sufficient supper of this luxurious diet, six hundred Ostriches, we are told, lost their lives. They were also introduced into the Circus, and upon one occasion no less than one thousand of them, together with a number of other animals, fell victims to the cruel thirst for excitement that debased the populace of Rome. In all parts of Southern and Central Africa, the flesh, feathers, and eggs of the Ostrich are highly esteemed, and form most valuable articles of traffic. A skin is in some parts worth from forty to one hundred dollars, but the Arabs are in the habit of thinning the feathers so that the trader rarely obtains a specimen on which this tax has not been levied. Anderson describes a foot chase of these birds, witnessed by himself, on the banks of Lake Ngami. On this occasion the flock was entirely surrounded, and the terrified birds driven with loud cries and a variety of strange noises into the water. Moffat also gives an amusing account of another mode adopted by the Bushmen for their destruction. A skin is stuffed with straw so as to form a kind of saddle, and covered with feathers; this is placed upon a man's head, his legs are painted white, and with the head and neck of an Ostrich mounted upon a stick in one hand and his gun in the other, he steals amidst an unsuspecting party, and by imitating their gestures so completely deceives them as to his identity, that they make no attempt to avoid the treacherous intruder. Amongst the many ways employed to cook Ostrich eggs, Burchell mentions that the Hottentots prepare them by boring a small hole at one end; into this they insert a thin twig and stir the contents briskly over a fire of hot ashes; when thus prepared they are excellent.

The *NANDUS* (*Rhea*), as the American representatives of the Ostrich are called, closely resemble their African brothers in general formation, but have a somewhat shorter wing, and the foot furnished with three toes. The bill is flat, of the same length as the head, broad at its base, and rounded at its tip, and very similar to that of the Ostrich. The toes are moderately long, connected by a skin at their base, and armed with straight sharp claws, which are compressed at their sides, bluntly rounded at their upper surface, and sharply ridged beneath. The wings are furnished with long plumes and terminated by a spur; the tail-feathers are entirely wanting. The region of the eye, cheek-stripes, and a ring covered with bristles that encircles the ear, are unfeathered and covered with a wrinkled skin; the feathers on the head and throat are small, narrow, and pointed; those on the rump are large, broad, and rounded with a soft flowing web; the eyelids are furnished with large stiff bristles. The male and female are almost alike in colour, but differ in size. We are now acquainted with three members of the above group,

THE TRUE NANDU, OR AMERICAN OSTRICH.

The TRUE NANDU, OR AMERICAN OSTRICH (*Rhea Americana*), has the plumage on the crown

of the head, upper throat, nape, and upper breast, and the bristles on the cheek-stripes of a blackish hue ; the centre of the throat is yellow, the rest of the neck and cheeks are light lead-grey, and the



AN OSTRICH HUNT.

back, sides of the breast, and wings brownish grey ; the other portions of the under side are dirty white. The eyes are pearl-grey, the bare parts of the face flesh-colour ; the beak is greyish brown, and the foot grey. The female is distinguishable by the paler tints of her neck and breast. An old female measured by the Prince von Wied was fifty-two inches and two-thirds in length, and seven feet across the span of the wings.



NANIDUS (*Rhea Americana*), WITH NEST AND EGGS.

The American Ostrich ranges south as far as forty-two or forty-three degrees ; it is abundant on the plains of La Plata, and, according to Azara, is found in Paraguay. Mr. Darwin saw it within the first range of mountains on the Uspalluta Plain, at an elevation of six or seven thousand feet above the sea ; but it does not cross the Cordilleras. At Bahia Blanca the latter observer repeatedly saw three or four come down at low water to the extensive mud-banks, which are then dry, for the sake, as the Gauchos say, of catching small fish. Although this Ostrich is in its habits so shy, wary, and solitary, and although so fleet in its pace, it falls a prey without much difficulty to the Indian or Gaucho, armed with the *bolas* . When several horsemen appear in a circle it becomes confounded, and does not know which way to escape ; it prefers running against the wind, yet at the first start it expands its wings like a vessel that makes all sail. On one fine hot day Mr. Darwin saw several of these birds enter a bed of tall rushes, where they squatted concealed until closely approached.

In Patagonia, at the Bay of San Blas, and at Port Valdes, Mr. King several times saw *Nandus* swimming from island to island, a distance of about two hundred yards ; they ran into the water, both when driven and of their own accord, and swam very slowly, with their necks extended a little forward, only a small part of their bodies appearing above the water. Mr. Darwin likewise on two occasions observed some of these Ostriches swimming across the Santa Cruz River, where it was about four hundred yards wide and its course rapid. The note of the male is described as being deep-toned and hissing, and so peculiar as rather to resemble the noise of some wild beast than the voice of any bird. At Bahia Blanca, in the months of September and October, the eggs of the Nandu were found in extraordinary numbers all over the country. They either lie scattered singly—in which case they are never hatched and are called by the Spaniards *huachos* —or they are collected together into a shallow excavation which forms the nest. Out of four nests which Mr. Darwin saw, three contained twenty-two eggs each, and the fourth twenty-seven. In one day's hunting on horseback sixty-four eggs were found ; forty-four of these were in two nests, and the remaining twenty were scattered *huachos* . The Gauchos unanimously affirm—and there is no reason to doubt their statement—that the male bird alone hatches the eggs, and for some time afterwards accompanies the young. The male when on the nest lies very close, and may almost be ridden over. It is asserted that at such times they are occasionally very fierce and even dangerous, and that they have been known to attack a man on horseback by trying to kick and leap on him. There can be little doubt that several females deposit their eggs in common ; indeed, the Gauchos, says Darwin, “unanimously assert that four or five have been watched and actually seen to go, in the middle of the day, one after another to the same nest.”

A family party of *Nandus* generally consists of a male and from five to seven females, who seem to have possession of a space of ground, from which all intruders in the shape of rivals are resolutely excluded ; but when the breeding season is over, several of these families associate together, and it is not an uncommon occurrence to see sixty of them forming one large flock, but they seldom wander very far from their native place. In the autumn they seem to prefer the neighbourhood of streams and marshy ground, where they find fruit and berries, or they wander among the thistles first introduced by the Spaniards, but now extending over thousands of miles of fertile soil ; while in the winter time they may be seen associating with cattle, sharing with them the long fine grass.

In swiftness the Nandu is but little behind its African representative. It can easily outrun and tire the best horse, not only by the swiftness of its pace, but by the wonderful skill with which it makes all sorts of windings and short cuts. The length of its usual step is stated by Bücking to be from twenty to four-and-twenty inches. When it raises its outstretched wings but still goes leisurely along, its stride is about three feet and a half ; but if pursued and going at full speed each step covers at least five feet, and the movements of its legs are so rapid that it is impossible to count its footsteps. Often during

the chase it will suddenly dart off from its direct course, with one wing elevated and the other depressed, at an angle of twenty-five or thirty degrees, and then with fierce speed resume its former direction, springing over ditches or fissures twenty feet across with the utmost ease; but it carefully avoids steep ascents, as over such it makes its way with difficulty.

During the rainy season these birds live principally upon clover, combined with such insects as happen to fall in their way. At a later period they frequent the plains where cattle graze, and feed almost exclusively upon grass; they show, nevertheless, a decided preference for the more nutritious vegetables imported from Europe, and often do considerable damage in the kitchen gardens of the settlers. Their presence, however, is by no means devoid of utility. One of their favourite articles of food consists of the unripe seeds of a plant somewhat resembling the burdock, which, owing to its abundance in some localities, is a serious detriment to the cattle-breeder, seeing that the burrs which it produces get entangled in the manes and tails of horses, or the fleeces of sheep, in which latter case they render the wool absolutely useless, by causing it to become as it were felted into inextricable knots and tangles, and indeed not unfrequently leading to the death of the animal, by producing sores that soon swarm with maggots, and occasion intolerable irritation. Whoever has examined the contents of the stomach of a Nandu, in the month of December, will have some idea of the quantity of these seeds that are thus devoured, and acknowledge that, were it only on account of the services thus rendered to the farmer, the Nandus deserve all the protection which they already enjoy at the hands of intelligent cattle-breeders. At all times of the year, and at all ages, they feed indiscriminately on a great variety of insects, and as the Guachos assert, also upon snakes and other reptiles. Like our Barn-door Fowls, they swallow quantities of small stones to facilitate the process of digestion. They drink but seldom, the moisture derived from dew and rain appearing to satisfy their ordinary wants; nevertheless, when they come to a pond, they may be seen to indulge in a draught, very much after the manner of chickens, scooping up the water with their beaks, and then holding their necks outstretched, and thus allowing it to trickle down their throats.

In the beginning of spring, which in the southern hemisphere is about the month of October, those males which have attained the age of two years, collect around them a seraglio of hen-birds, varying in number from three to seven or more, and immediately begin to drive all rivals from their vicinity, by formidable blows inflicted with their beak and wings. They then at once begin their courtship, by performing, apparently for the gratification of their mates, a remarkable sort of dance; with wings outspread and trailing upon the ground, they stalk hither and thither, or suddenly breaking into a run, dart forward with great speed, beating the air with their wings, and then checking their career, strut about, bowing to the female with ludicrous assumption of dignity, and recommence the same performance. During this exhibition the male invariably gives utterance to a loud bellowing noise, and manifests every indication of being in a state of great excitement. When in their native wilds, the courage and pugnacity which they display at this season is of course expended on their rivals, but when in captivity their anger seems to extend to intruders of every description. Visitors and even their keepers must beware of the formidable blows inflicted with their hard beaks, or sometimes with their feet, as they kick much in the same manner as the African Ostrich. For a very interesting account of the proceedings of these birds during incubation we are indebted to Bodinus. In the case of a pair which bred in the Zoological Gardens of Cologne, he observed that the male, upon whom alone devolves the duty of preparing a nest, did so by continually moving about while sitting in a particular spot, until at length, without any scratching or removal of the soil, a cavity was formed in which the nest, consisting of a little dried grass, roughly arranged, was placed. The female takes no share whatever in the preparation of the nest. In the Pampas, before brooding time, which begins there about the middle of December, solitary eggs, called by the natives "foundlings," are

everywhere to be met with ; they seem to be produced by females obliged to lay before the male has been able to make preparations for their reception. The nest is generally a shallow excavation in some dry spot of ground beyond the reach of inundation, and usually so placed as to be concealed by thistles and long grass. A very favourable locality is in holes made by the wild cattle, who use them as a kind of dust-bed, wherein they shelter themselves against the attacks of insects, until they have worn them so deep as to be larger than convenient for themselves, but exactly suited to the requirements of the male Nandu. Should, however, no such ready-made excavation present itself, the bird must perforce undertake the necessary labour of clearing a space of ground of the overgrowing vegetation, lining it scantily with dried grass, a ring of which material always surrounds the margin, and thus preparing it for the reception of the eggs. The number of eggs laid by each female has been a subject of much dispute. Azara relates that at times seventy or eighty eggs have been found in a single nest, while Darwin gives forty or fifty as the greatest number. Böcking tells us, on the authority of the Guachos, that fifty eggs have been met with, although he himself never saw more than twenty-three, and gives from thirteen to seventeen as an average number from all the nests he examined. The eggs themselves appear to be very variable in size, some being not much larger than those of a Goose, while others measure five inches in length. Around the nest, in a space extending from its margin to a distance of fifty paces, "foundlings" are always to be met with, and these appear to be fresher than the eggs within the nest. The colour of the eggs is a dull yellowish white, marked with small, greenish yellow dots, placed around the large pores. If exposed to the sun, these colours rapidly fade, insomuch that after a week's exposure the egg-shells are all snow-white.

As soon as the nest has received its full complement, the male alone undertakes the duties of incubation, the hens all retiring to a distance ; nevertheless, they generally keep together, and always remain within the territory previously claimed by the master of the family. During the night, and until the morning dew has been dried up, the male never leaves his place upon the nest, but in the daytime he allows himself greater liberty, and may be seen feeding at irregular intervals, that depend upon the brightness of the sky or the temperature of the weather. Towards the commencement of incubation the male Nandu appears rather careless of his charge, and upon the slightest alarm will leave his nest until the danger is past ; but at a later period he broods very assiduously, and will sometimes sit still till he is nearly ridden over, springing up suddenly, immediately before the unwary traveller, often frightening a spirited horse, and putting his rider in great danger. Neither does the brood always escape the consequences of such precipitancy, some of the eggs being frequently trodden upon and crushed, or kicked out of the nest by the frantic bird. The affection of the male Nandu for his offspring is, however, more conspicuously visible when a traveller approaches his brooding-place in a more leisurely manner. On such occasions the anxious parent hastens to meet the intruder, with wings outspread and ruffled feathers, limping slowly along and staggering in a zigzag course, using every endeavour to divert the attention of the stranger from the real cause of anxiety.

Although the sitting Nandu is by no means fond of visitors, he will not desert the eggs so long as his nest is not actually disturbed, and has even been known to continue sitting upon the residue after some of the eggs have been taken away. In South America the young Nandus make their appearance from the egg-shell about the beginning of February. Their growth is surprisingly rapid, insomuch, indeed, that chicks of a fortnight old are already a foot and a half high. Even on the third or fourth day after they are hatched it would be difficult for a man to overtake them in running, were it not that when hotly pursued, young birds have a habit of falling flat upon the ground, where they easily escape observation. For about five weeks they follow their father only, but the female parents gradually join the party until the family is complete. By the arrival of autumn, *i.e.*, in April or May, the young birds have exchanged their first clothing of down for a suit of dirty, yellowish grey feathers.



THE TRUE NANDU, OR AMERICAN OSTRICH (*Rhea Americana*).

In addition to the all-reaching destructiveness of mankind, the great enemy to the Nandus is fire. About the time when these birds are beginning to breed, the herdsmen are in the habit of taking advantage of a high wind, for the purpose of burning the long dry grass upon the vast steppes or prairies, in order to clear them from the last year's straw. Before such a fire as is thus kindled all living beings can only take refuge in the low-lying and wettest portions of the country, and innumerable animals suffer a cruel death. On these occasions the inhabitants of the district collect as a great prize all the Nandus' eggs upon which they can lay their hands. One of these eggs indeed is worth about fifteen Hens' eggs, and is with the natives a very favourite dish. To prepare them, the narrow end is broken open, the white, which is said to have a disagreeable taste, is thrown away, and then having added a little butter, salt, and pepper, the yolk is cooked by being stirred over the fire, using the egg-shell as a saucepan. To boil one of these eggs hard in European fashion, requires forty minutes. They are excellent for all culinary purposes, but unfortunately will not keep. The flesh of the Nandu much resembles horse-flesh in its colour, nevertheless the old birds are a favourite dish among the Indians, while the young are not distasteful even to European palates; they likewise afford a rich supply of oily, semi-fluid fat, which while fresh is much esteemed, and used like butter. Unfortunately, however, it soon becomes rancid, and is then only useful for softening leather; and even for this purpose, in a country so abounding in hides, it is not of much value. Out of the skin covering the neck the Gauchos are in the habit of manufacturing small bags, suitable for many domestic articles, while from the flexible shafts of the feathers, boys construct springes with which they catch water-fowl. The full-grown feathers of the mature bird are likewise used as ornaments to the harness of horses, or are woven into very beautiful rugs, the patterns of which are extremely elegant and varied. Feathers of inferior value are made into bunches for dusting furniture, while the best and largest afford plumes scarcely inferior to those of the Ostrich.

Böcking estimates the duration of the life of the Nandu at fourteen or fifteen years, and believes that many of them die from sheer old age, inasmuch as he has observed individuals (especially in the winter season) at the point of death, but exhibiting no external injury or internal lesion to account for their condition.

With the exception of mankind, these gigantic and swift-footed birds indeed might seem to enjoy an immunity from the attacks of any ordinary assailants. Sometimes the adult may be surprised by a prowling jaguar, or an Eagle may swoop upon the young, and by chance carry off a victim, but such accidents would seem to be of rare occurrence. Perhaps among the most inveterate of their foes are the Spurred Lapwings (*Hoplopterus spinosus*), whose animosity against these giants of the prairie is positively ludicrous. No sooner does a Nandu approach a pair of these little birds than they set up an intolerable screeching, like Crows on the appearance of a Hawk; they strike at him with their wings, and by the pertinacity of their attacks generally make him glad to get away from such contemptible assailants, who valorously follow him for a little distance, and return with every demonstration of triumph.

The chase of the Rhea is a very favourite exercise. The Indians and the Gauchos hunt them on horseback, kill them with the *bolas*, or course them with dogs bred for the purpose; indulging in this sport not so much for the sake of the booty as for the purpose of testing the swiftness and endurance of their noble horses, and their own skill in throwing the *bolas* or the lasso. When a hunting party is announced, numerous well-mounted horsemen assemble, and taking advantage of the wind, approach the birds as closely as they can, at a slow pace, until the moment when the Nandus begin to run, which is the signal for man and horse to exert themselves to the uttermost, and at length an individual is singled out and separated from the flock as the special object of attack. In spite of the swiftness of the poor bird, the Gauchos are soon close at his heels, and the horseman who happens to gain

the left side throws his bolas at the devoted victim, which an instant afterwards falls to the ground a mere shapeless mass of feathers, and rolls over killed by the momentum of its own career.

Should the first horseman miss his aim another immediately takes his place, and launches from his hand the terrible weapon. This is repeated by successive riders, until the game is either brought down, or succeeds in reaching some swamp, where the horses are unable to follow.

The name of Nandu is an imitation of the cry of the male during the breeding season. After pairing-time is over the tones are very different, and not easily described. In the neighbourhood of the peaceful settlers who leave them undisturbed, the Nandus become so tame and trustful, that they may be seen associating with tethered horses and milch-cows; indeed, they may be looked upon as half domesticated, as they carelessly graze among the cattle, and scarcely stir out of the way either of dogs or man. Nevertheless, no sooner do they see the Gaucho, who hunts them, than away they go, using every effort to escape, and displaying considerable cunning in avoiding the observation of their enemy. The appearance of a party of Indians puts them into an indescribable state of alarm; they will fly before them for hours together, and even horses and herds of cattle seem to share their dismay and accompany their flight; but if the hunter, creeping upon his hands against the wind, manages to get near a flock of Nandus and, lying flat down, waves a pocket-handkerchief, the curiosity of the birds is at once excited and gradually gets the better of their fear, until the whole flock with their male leader at their head, with outstretched neck approaches within gunshot of their wily enemy. To kill the Nandu with a gun, however, requires a good marksman, as these birds are hard to kill, and will often run a long way after receiving a ball. Should a flock of them be beguiled in the way we have just described and one of them fall and begin to struggle, the rest immediately come to its assistance with most ridiculous gestures, as if they had St. Vitus' dance in their legs and wings, and thus the sportsman is enabled to have a second shot. The report of the gun, moreover, does not frighten them, for if it misses they will come still nearer, as if to satisfy themselves as to what may be the meaning of so much noise. A wounded Nandu follows his companions as far as he can, and when exhausted, steps on one side and is left to his fate. In South America these birds are everywhere to be seen in a state of semi-domestication, having been caught when young, and are allowed to run about without restraint; they seem so much attached to the locality where they have been reared, that towards evening they always come home of their own accord. The Nandu is very generally met with in European zoological gardens, where it requires less attention than any others of the Ostrich race, and provided it has enough to eat, is content with the simplest diet. Moreover, it seems quite able to bear the vicissitudes of climate, and might at least become an ornament to our parks, even were it useless for any other purpose.

THE LONG-BILLED NANDU.

The LONG-BILLED NANDU (*Rhea macrorhyncha*) is distinguished from the species above described by its dark brown plumage, which on the lower neck is nearly black, and on the upper neck of a whitish grey colour.

THE DWARF NANDU.

The DWARF NANDU (*Rhea Darwinii*) is smaller than the preceding; its plumage is principally of a light brownish grey, each feather being enlivened by a whitish edge. This species, which is named after Mr. Darwin, was first heard of by him in North Patagonia, where it is called the *avestruy petise*. The eggs were well known to the Indians, who described them as being a little smaller than those of the Common Rhea, but of a slightly different form, and of a blue tinge. Several of these birds were met with at Santa Cruz in parties of four or five, or in pairs. Unlike the more northern species, they did not spread their wings when starting at full speed.

The EMUS (*Dromæus*), a group of strange and interesting birds inhabiting Australia, form as it were the connecting link between the Ostrich and the Cassowary, nearly resembling the former in their general appearance, but differing from it in the comparative shortness of their legs and neck, and the less prominent development of the hinder parts of the body. The beak is straight, compressed at its sides, round at its extremity, and furnished with a ridge at its culmen; the large



THE EMU (*Dromæus Novæ Hollandiæ*).

nostrils are covered with a skin and situated in the centre of the bill. The wings and tail are but slightly developed, the strong legs are covered with scales, and the foot furnished with three toes armed with powerful claws. At a distance the plumage somewhat resembles hair, the webs of the feathers being all loose and separate; as is the case with the Ostrich, they take their origin by pairs from the same shaft. The wings are clothed with feathers exactly resembling those of the back, which divide from a middle line and fall gracefully over on either side. The entire plumage is of a dull brown, mottled with dirty grey; the feathers on the head and neck becoming gradually shorter,

and so thinly placed, that the purplish hue of the skin of the throat and a patch round the ears is perfectly visible. The sexes differ but little in size, and are alike in colour. We have to thank Dr. Bennett for the first full account of these remarkable birds, drawn from observation of several kept about his own house. With their life in a wild state we are unfortunately but little acquainted, except that they frequent the open plains in large flocks, and are especially numerous about Botany Bay and Port Jackson.

THE EMU.

The EMU (*Dromæus Novæ-Hollandiæ*) is larger than the Nandu, but inferior in size to the Ostrich, its height usually not exceeding six feet. Australian hunters have occasionally killed specimens measuring seven feet to the crown of the head. The coloration of the plumage is principally of a uniform pale brown, of a darker shade on the head, throat, and centre of the back, and paler on the under side. The eye is light brown, the beak horn-grey, and the foot pale brown; the bare parts of the face are of a greyish tinge.

This bird is much valued on account of the clear, bright yellow oil extracted from it. This is obtained by boiling, and employed both for burning and as an excellent liniment in gouty cases.

Dr. Bennett informs us that the natives regard the flesh as a highly luscious treat when cooked with the skin on, and that the fibula or small bone of the leg is employed by them as an ornament.

The flesh of the Emu, according to Mr. Cunningham, resembles beef "both in appearance and taste, and is good and sweet eating; nothing indeed can be more delicate than the flesh of the young. There is, however, but little of it fit for culinary use upon any part except the hind-quarters, which are of such dimensions that the shouldering of two hind legs homewards for a mile's distance proved," he says, "as tiresome a task as he ever encountered in the colony."

Dr. Leichardt "found the flesh of these birds of the greatest service during his overland route from Moreton Bay to Port Essington," in the course of which, but more particularly between the head of the Gulf of Carpentaria and Port Essington, the sight and capture of Emus was almost a daily occurrence; so abundant, in fact, were they, that he saw in the short space of eight miles at least one hundred, in flocks of three, five, ten, and even more at a time. Some curious practices exist with respect to this bird among the natives, and young men and boys are not allowed to feed upon it. The note of the Emu is a low, booming or pumping noise, which is produced in the female by means of the expansion and contraction of a large membranous bag, surrounding an oblong opening through the rings of the trachea; whether this peculiarity of structure is to be found in the male, we are not aware. The Emus pair with tolerable constancy, and the male bird appears to take a large share in the task of incubation. The eggs, which are merely placed in a cavity scooped in a sandy soil, are six or seven in number, and of a beautiful dark green, resembling shagreen in appearance; they are five inches and three-quarters long, by three inches and three-quarters in breadth. The eggs are held in much esteem by the natives, who feed upon them whenever they can be procured.

The nest of the Emu is situated, as we are informed by Dr. Bennett, in a scrub upon the hills, where a space is scraped, similar to those formed by brooding hens. The sticks and leaves, which alone compose the nest, are laid round the cleared spot, and here the eggs are deposited without regard to regularity, the number varying from nine to thirteen. It is a curious circumstance that there is always an odd number. It is now ascertained beyond a doubt that the eggs are hatched by incubation, and not, as was once supposed, by solar heat. They are of large size, and of a beautiful blueish green colour.

THE SPOTTED EMU.

The SPOTTED EMU (*Dromæus irroratus*) is readily distinguished from the above birds by its

comparatively slender build, weaker feet, longer toes, and the spots upon its plumage. This species differs from the *Dromæus Novæ-Hollandiæ* in having the whole of the body-feathers distinctly marked with narrow transverse bars of light grey and brownish black; the feathers on the back and sides are broader, longer, and less silky in texture than those of the common kind, the latter difference being quite evident to the touch. The upper part of the body and the neck are nearly black, and the feathers appear thicker than those on the same parts in the other species. "Having seen," says Mr. Gould, "adult and youthful examples of this Emu, all bearing the characters which suggested its specific name, I have no doubt of its being distinct from the *D. Novæ-Hollandiæ*. I am almost equally certain that it is confined to the western division of Australia, and that it represents there the Emu of the eastern coast. Whether the two species incubate in South Australia, and if the present bird extends its range to north and north-west, future research must determine."

The CASSOWARIES (*Casuarii*) are distinguishable from the group above described by their compact body, short thick neck, low but powerful legs, as also by the helmet that adorns their head, the peculiarity of their plumage, and the formation of their beak and toes. In these birds the bill is straight, compressed at its sides, arched at its culmen, slightly hooked at its tip, and incised at both margins; the small, oval-shaped nostrils are situated at the extremity, and the elevated, compressed helmet at the base of the beak; the neck, which is bare and brightly coloured on its upper portion, is furnished with either one or two lappets; the wings consist of five strong, unwebbed, and rounded shafts; the tail is not developed; the long robust tarsi are covered with hexagonal scales except near the toes, where the scales are transverse. The lateral toes are longer than the middle one, and the outer toe longest of all; the claws are moderate and blunt, that on the centre toe very long and powerful. The plumage resembles hair rather than feathers, the webs being disunited and streaming. Five, or according to Gould six, species of these remarkable birds have been discovered, but with three of them we are almost entirely unacquainted; even the habitat of the *C. uniappendiculatus* and *C. bicarunculatus* is uncertain. We also know nothing of the *C. Kaupii*, the type of the race, except that it was found by Rosenberg in New Guinea, and called by him after Kaup the naturalist.

THE HELMETED CASSOWARY.

The HELMETED CASSOWARY (*Casuaris galeatus*) is principally black, the face greenish blue, and the back of the head grey; the front of the neck is violet, its sides blue, and its hinder portion bright red. The eye is reddish brown, the beak black, and the foot greyish yellow. The plumage of the young has a brownish tinge; the habitat of this species appears to be confined to the forests on the island of Ceram, where it was discovered by the Dutch traveller, Forster. We are almost entirely ignorant of the habits of these strange birds in their native wilds.

THE MOORUK.

The MOORUK (*Casuaris Bennetti*). The Mooruk is considerably smaller and shorter than the Cassowary, and has much thicker legs. The helmet rises high at the base and then branches out into two overhanging lobes, the horny part which unites them being lowest in the centre. The back part of this elevated crest is flat, and rises rather obliquely from the head near the occiput. A specimen sent to England by Dr. Bennett, when it first arrived, was rufous mixed with black on the back and under part of the body, and raven-black about the neck and breast; the loose wavy skin of the neck was beautifully coloured with iridescent tints of blueish purple, pink, and an occasional shade of green; and the feet and legs were of a pale ash-colour. It afterwards became generally darker, the bare skin of the fore part of the neck of a more uniform smalt-blue, and the legs somewhat darker in

colour. The large strong feet and legs exhibit a remarkable peculiarity in the extremity of the claw of the inner toe, it being nearly three times as large as the other claws. The horny plate on the top of the head resembles mother-of-pearl darkened with blacklead. The form of the bill differs considerably from that of the Emu (*Dromæus Novæ-Hollandiæ*), being longer and more curved, with a black and leathery cere. Behind the horny head-plate rises a small tuft of black, hair-like feathers which are continued in greater or less number over most parts of the neck.

The Mooruk, according to Gould, lives exclusively in the gullies and humid parts of dense forests, and feeds upon the roots of ferns and plants peculiar to such situations. The first specimen ever seen in Europe was purchased by Dr. George Bennett, so well known from his contributions to science, and sent by him to the Zoological Society of London. The bird was obtained at a native village lying at the foot of two hills, called by navigators the "Mother and Daughter," and situated on that part of the coast of New Britain lying between Cape Palliser and Cape Stephen. In 1858 Dr. Bennett purchased two other specimens brought to Sydney by Captain Devlin, who bought them in New Britain and had had them in his possession for eight months. According to the statement of that gentleman, the natives of that part capture them when very young and rear them by hand. The adults it is impossible to make prisoners, as they are remarkably swift and possess great strength in the legs; on the least alarm they at once dart into thick brushwood, where no human being could follow them, and disappear like magic. We can do no better than give our readers the benefit of Bennett's own graphic and circumstantial account of this Cassowary, which he alone has been at the trouble of training and closely observing:—"My birds," says that naturalist, "when placed in the yard walked about as tame as Turkeys. They approached any one who came into the yard, pecking the hand as if desirous of being fed, and were very docile. They began by pecking at a bone, probably not having tasted any meat for some time, and would not while engaged upon it touch some boiled potatoes which were thrown to them; indeed, we found afterwards that they fed better out of a dish than from the ground—no doubt having been early accustomed to be fed in that manner. They were as familiar as if born and bred among us for years, and did not require time to reconcile them to their new situation, but became sociable and quite at home at once. We found them next day rather too tame, or like spoilt pets, too often in the way. One or both of them would walk into the kitchen, and while one was dodging under the tables and chairs, the other would leap upon the table, keeping the cook in a state of excitement; or they would be heard chirping in the hall, or walk into the library in search of food or information, or walk up-stairs, and then be quickly seen descending again, making their peculiar chirping, whistling noise; not a door could be left open but in they walked, familiar with all. They kept the servants constantly on the alert; if one of them went to open a door, on turning round she found a Mooruk behind her, for they seldom went together, but generally wandered apart from each other; if any attempt were made to turn them out by force, they would dart rapidly round the room, dodging about under the tables, chairs, and sofas, and then end by squatting down under a sofa or in a corner, so that it was impossible to remove the bird except by carrying it away; on attempting this, the long, powerful muscular legs would begin kicking and struggling and soon get released, when it would politely walk out of its own accord. I found the best method was to entice them out as if you had something eatable in your hand, when they would follow the direction in which you wished to lead them. The housemaid attempting to turn the bird out of one of the rooms, it gave her a kick and tore her dress. They walked into the stable among the horses, poking their bills into the manger. When writing in my study, a chirping whistling noise is heard. The door, which is ajar, is pushed open, and in walk the Mooruks, who quietly pace round the room inspecting everything, and then as peaceably go out again. If any attempt is made to turn them out, they leap, dart about, and exhibit a



HELMETED CASSOWARY (*Casuarus galeatus*).

wonderful rapidity of movement, which no one would suppose possible from their quiet gait and manner at other times. Even in the very tame state of these birds, I have seen sufficient of them to know that, if they were loose in a wood it would be impossible to catch them, and almost as difficult to shoot them. One day, when apparently frightened at something that occurred, I saw one of them scour round the yard at a swift pace, and speedily disappear under the archway so rapidly that the eye could hardly follow it, upsetting in its progress all the poultry that could not get out of the way. The lower half of the stable door, about four feet high, was kept shut to prevent them going in, but this proved no obstacle, as it was easily leaped over. They never appeared to take any notice of, or to be frightened at the Jabiru, or Gigantic Crane, which was in the same yard, although that sedate, stately bird was not pleased at their intrusion. Having had these birds for a considerable time in my possession," continues Dr. Bennett, "I had ample opportunity of hearing all their cries. I never heard them utter a sound like 'Mooruk,' and am inclined to consider that the name signifies in the native language 'swift,' resembling closely the Malay term 'amuck,' or mad career, and the extraordinarily rapid motions of these birds rather confirm my idea on this subject.

"The chirping sounds of the Mooruk are very peculiar, being modulated according to the urgency of their wants and desires. Sometimes these notes are varied, as if speaking—at one time they are mild, at another very vehement, then rising to a higher and more rapid chirp as if scolding, afterwards becoming plaintive, as if beseeching for something; again loud and rapid, as if impatient at delay; indeed, at a little distance, this modulation of the chirping notes seems as if the birds were holding a conversation, and has a very singular effect. One morning I observed the female Mooruk rolling in the yard upon its back with the feet uppermost, when it suddenly started up, leaping and racing round the enclosure, chirping all the while, kicking the trees and posts, elongating and drawing itself up to its greatest height, then running round the trees and often coming with such violence against them, and kicking so high with both its legs at the same time as to tumble on its back, so that I feared it was seriously hurt, but it rose again and ran about, not having received the least injury. She thus continued kicking and running, all the while keeping in an erect position, until she was apparently exhausted, and then, with open bill and panting, very quietly resumed her tranquil walk about the yard, picking about as usual, as if nothing had happened to disturb her former tranquillity. On the afternoon of the same day the male bird had one of these running and kicking freaks, racing about the yard and attacking any person or fowl who ran away from him; he had a chase after a consequential Bantam Cock, and endeavoured to trample the poor thing underfoot, much to the dismay and horror of this important bird; but I remarked that although he rushed and kicked violently against the trees and had many falls, yet he had a method in his actions—judging from the care he took not to come in contact with the Jabiru, of whom he appeared to entertain a very wholesome dread. Whether he had a natural respect for the bird on account of his serious deportment, or whether it was the formidable, sword-like beak he dreaded, I know not, but when in his most rapid and mad career he approached the Jabiru, he always contrived to avoid him. He seemed to select the fowls, and dispersed them in all directions over the yard. All these wild actions would continue for about half an hour, when he would commence pecking about, and remain as quiet as before.

"One morning when the male bird was in one of these racing humours, some strange fowls wandered into the yard; he immediately attacked them, and did not cease until he had fairly kicked them out, trying also to trample them under foot, and uttering at the same time a peculiar, blowing, snorting, and hissing sound, which I observe is only expressed when he is serious in his attacks. It is curious that he appeared to know our fowls; for although he chased them, he never tried to drive

them out of the yard, which he invariably did with the strange poultry. The Bantam Cock was on the top of the wall, out of reach, viewing the kicking scene below among his hens with the greatest astonishment. The Bantam and his hens were not our property, but were tenants next door, and the Mooruk therefore considered himself justified in turning them out. It is common, however, at other times to see our poultry and the Mooruks on the most amiable terms, scraping together, and feeding on the dunghill and in the yard." So extraordinary is the voracity of these strange birds, that no object, however impossible of digestion, comes amiss to them. Dr. Bennett's account of the annoyance his captives gave by indulging this propensity is too amusing to be curtailed.

"The instant the Mooruk saw an egg laid by a hen, he darted upon it, and, breaking the shell, devoured it as if he had been accustomed to eggs all his life. A servant was unpacking a cask; as soon as the birds heard the noise they both ran down to it, and remained there whilst it was unpacked, squatting down on each side most intently watching the process, and occasionally pecking at the straw and contents. When the carpenter was in the yard making some alterations in their cage, previous to their voyage to England, it was very amusing to see them squat down upon their tarsi like dogs, watching the man with the greatest apparent interest in all his actions, enjoying the hammering noise, and occasionally picking up a nail, which was not in this instance swallowed, but again dropped. One of them, however, bolted the oilstone, which so alarmed the man lest the bird had committed suicide, that he hurried to me and informed me of the circumstance, when, to his surprise, I told him if he did not take care they would also swallow his hammer, nails, and chisels. The birds kept close to the man until he left for dinner, resuming their position near him as soon as he returned to work, and not leaving him till he had finished. One morning the male Mooruk was missing, and was found in the bedroom upstairs drinking out of the water-jug. The same bird swallowed a bung-cork which measured one inch and a half in diameter—indeed, both seemed to swallow anything, from butter and eggs to iron bolts, nails, and stones. The servant was starching some muslin cuffs, and having completed one and hung it up to dry, she was about to finish the other, when hearing the bell ring, she squeezed up the cuff, threw it into the starch, and attended to the summons. On her return the cuff was gone, and she could not imagine who had taken it during her brief absence, when she discovered that the Mooruk was the thief, its beak and head being covered with starch. Notwithstanding this propensity to swallow every variety of object, the digestive power of these birds is by no means strong, even such food as unboiled grain or raw potato being rejected whole from the stomach."

Dr. Bennett's male Mooruk measured three feet two inches to the top of the head, and the female three feet. An egg presented by that gentleman to Mr. Gould was five inches and a half long by three and a half broad, the shell a pale buff, covered with pale green corrugations. Another egg, laid in the Gardens of the Zoological Society, was pale grass-green, much smoother, and more finely granulated than that of the Common Cassowary; it measured six inches by nearly four, and weighed twenty-two ounces and a half. The pair of Mooruks whose habits are above described bred in the London Zoological Gardens. According to Dr. Sclater, the incubation lasted seven weeks, the male alone brooding. A single young one was hatched, which was unfortunately destroyed the same day by rats. In 1866 the parents were more successful, and the scientific were delighted with the sight of a young Mooruk hatched in captivity. This pretty and interesting little creature was covered with light, yellowish brown down, and striped with dark brown on its body and legs. The first day of its quitting the shell it could scarcely walk, but on the second used its legs readily, and uttered a cry somewhat resembling that of a chicken. The father, who alone had brooded, at once undertook entire charge of his little treasure, leading it about with the utmost care, guiding it to pick up the food thrown down for it, and at night allowing it to nestle beneath his plumage.

THE AUSTRALIAN CASSOWARY.

The AUSTRALIAN CASSOWARY (*Casuarius Australis*). This bird stands about five feet high; the head is without feathers, but covered with a blue skin. Like the Emu, it is almost wingless, its wings being mere rudiments. The body is thickly enveloped in dark brown wiry feathers; on the head is a large prominence, or helmet, of bright red colour, and to the neck are attached, like so many bells, six or eight round fleshy balls, of bright blue and scarlet, which give the bird a very beautiful appearance.

This Cassowary has never been brought to Europe, only one specimen having been until recently obtained, which unluckily was lost shortly after its capture. A communication from P. A. Eagle, Esq., with which we have been kindly favoured, will best explain the importance attached by scientific men to the discovery of this Australian species:

“Compared with Asia,” says Mr. Eagle, “Australia presents the greatest contrast in its natural productions to be found between any two zoological regions of the earth; and yet the line which separates these two great provinces actually passes between two of the islands forming part of the great volcanic chain running from Sumatra to Timor, namely, the island of Bali on the west, and Lombok on the east, separated from each other by no more than fifteen miles; so that within a two hours’ sail, without losing sight of land, you pass from Bali, full of Fruit Thrushes, Woodpeckers, and the general ornithology of Asia, to Lombok, where the Cockatoos, Honey-eaters, Brush Turkeys, and other members of the Australian fauna, appear suddenly in full force. The forests of Australia are destroyed by myriads of timber-boring larvæ of various insects; but on the whole area there is not to be found a single Woodpecker, or any bird to do its office; yet, in the same latitudes, in any other part of the world, Woodpeckers occur in special kinds for each great district in abundance, wherever forest trees grow, their function being to pick out those timber-eating larvæ from the wood. The entire absence of the whole family of True Pheasants and Vultures, found in numbers in any other great region of the earth, is also a striking negative character of the ornithology of Australia; whilst its innumerable Honey-eaters, Cockatoos, and Brush-tongued Lories, found in no other region, give to it an equally marked positive character.

“The very deep sea surrounding Ceram, and other islands which constitute the appendages, as it were, of Asia on one side and Australia on the other, suggests a curious problem to the naturalist as to how they got their inhabitants. Great interest, therefore, attaches to the recent discovery of a Cassowary in Australia, as yet only imperfectly known, and so nearly related to the Cassowary of Ceram that doubts have been expressed as to their distinctness. They are both incapable of flight, the wings being represented by five or six bare, cylindrical, pointed quills, like those of a porcupine, and, consequently, the bird could not fly nor pass from one island to another. The *Casuarius Australis* was first indicated by Mr. Wall, the naturalist to Kennedy’s expedition, who shot a specimen in a gully at Cape York, and a notice of it appeared in 1854 in a Sydney paper; but, as the specimen was lost, much doubt existed as to the species. A bunch of feathers taken from a native hut on the Upper Burdekin, and sent to Dr. Sclater in 1866, again drew attention to the probability of a species of Cassowary inhabiting Australia, but still there was no evidence of the species. In June, 1868, a specimen reached the Zoological Society of London; and Dr. Sclater states that although he had not compared it with the Cassowary of Ceram, it seemed to differ—first, in the form of the crest; secondly, in having thicker tarsi, and the long straight claw of the inner toe more developed; thirdly, by the cobalt-blue colour of the naked skin of the neck and throat. Very recently, however, a young specimen, about two feet long, has been presented to the National Museum of Melbourne, which establishes the fact that it is truly distinct as a species from the so-called Indian



THE KIVI-KIVI (*Apteryx Australis*).

Cassowary, and "apparently peculiar to Australia, or at any rate affords no support to the theory of the former union of Australia with the northern islands."

There is fortunately a young specimen of the Ceram Cassowary nearly of the same size as this young Australian one, and they are both of the same light, rusty brown colour, the *Casuarinus Australis* being rather redder on the head and slightly blacker on the back than the *C. galeatus*. In neither specimen is the helmet developed. On comparing the two specimens, the tarsi of the Ceram species were found to be rather stronger than those of the *C. Australis*, and the left inner claw of the Ceram specimen half an inch shorter than the right one, one side agreeing with the Australian species. The little feathers on the two caruncles on the throat are nearly black in *C. Australis*, but much lighter in *C. galeatus*. Two distinctive characters are, however, shown by these specimens, not noticed before. The bill of the Australian Cassowary is much more slender than that of the Ceram bird; both mandibles, taken together vertically, being one-third deeper in the Indian species than in the Australian one, while the plumage of the latter is much looser than the former, from having the lateral barbs much fewer or further apart.

There can now be no doubt of the distinctness of the Queensland species, although very closely allied to that with which it has been compared, and also to the Mooruk of New Britain.

According to a correspondent in the *Sydney Herald*, those who obtained the adult bird state that they saw it running about in companies of seven or eight, in deep valleys at the foot of high hills. The flesh was eaten and found to be excellent—a single leg affording more food than several hungry men could dispose of at a meal. The whole build of this Cassowary is stronger and heavier than that of the Emu; it makes use of its powerful legs in the same manner as that bird. It is described as very wary, but its presence may be at once detected by its utterance of a peculiarly loud note, which is taken up and echoed along the gullies it principally frequents.

The KIVIS (*Apteryges*) bear but little resemblance to any of the members of their order as yet described. They are distinguishable by their compact body, short thick neck, comparatively short and four-toed foot, the entire absence of the tail, and the merely rudimentary development of the wings. Their plumage consists of long, lancet-shaped, flowing, and glossy feathers, which increase in size from the neck downwards, and have a somewhat loose web. The bill is very long, covered at the base with a long cere, and rather depressed, with the tip of the upper mandible overhanging the lower portion; the small nostrils are situated at the extremity of the beak. The legs are strong and short; the anterior toes long, powerful, and armed with formidable claws; the thick, short, hinder toe does not touch the ground, and is furnished with a still stronger claw resembling the spur of a Barn-door Cock. The tarsi and feet are covered with scales of various sizes.

These birds are strictly a New Zealand family. The first Apteryx seen in England was presented to Dr. Shaw in 1812, and after his death passed into the possession of the Earl of Derby. No other specimen was seen in Europe for more than twenty years, and its existence was therefore doubted by naturalists until 1833, when Mr. Yarrell read a most interesting paper on the subject before the Zoological Society, and established the family among accredited species. These strange birds, which at the first glance somewhat resemble a quadruped in appearance, are, it is said, wholly nocturnal in their habits, searching for food during the night, and moving actively, but with a most uncouth gait (see Plate), from place to place.

THE KIVI-KIVI.

The KIVI-KIVI (*Apteryx Australis*) has the plumage principally of a greyish brown, which is darkest on the back. The wing-quills are soft and rudimentary, and the face covered with soft hairs. This species is thirty inches long; the bill, from the base of the forehead to the tip, six

inches; the reticulated tarsus two inches and a half; and the centre toe, with the claw, three inches and five-eighths. The favourite resorts of this bird, according to Bartlett, are localities densely covered with fern, among which it can readily conceal itself; if very hard pressed by the dogs usually employed in its capture, it takes refuge in crevices of the rocks, hollow trees, and in the deep holes which it excavates in the ground. In the latter chamber-like cavities it is said to construct its nest, which is composed of grasses and dried ferns.

"While undisturbed," says Mr. Short, in a communication to Mr. Yarrell, "the head is carried far back in the shoulders, with the bill pointing to the ground; but when pursued it runs with great swiftness, carrying the head elevated like the Ostrich. It is asserted to be almost exclusively nocturnal in its habits, and it is by torchlight that it is usually hunted by the natives, by whom it is sought after with the utmost avidity, the skins being highly prized for the dresses of the chiefs; indeed, so much are they valued that the natives can rarely be induced to part with them. The feathers are also employed in the construction of artificial flies for the capture of fish, precisely after the European manner. When attacked it defends itself very vigorously, striking rapid and dangerous blows with its powerful feet and sharp spur, with which it is also said to beat the ground in order to disturb the worms upon which it feeds, seizing them with its bill the instant they make their appearance; it also probably feeds upon snails, insects, &c."

"The Apteryx," says Dr. Sclater, "is so scarce a bird even in New Zealand that it can scarcely be expected that we should be well acquainted with its mode of reproduction. His Excellency Sir George Grey has lately sent me an extract from a letter addressed to him by T. E. Manning, Esq., dated Hokianga, on the north-western coast of the Northern Island, February 2nd, 1863. 'Several years ago an old native, who had been a great Kivi hunter in the times when the Kivis were plentiful, told me a strange tale about the manner in which the bird hatches its eggs. I, of course, cannot vouch for the correctness of the story, but think it worth relating; he said that the Kivi did not sit like other birds *upon* the egg, but *under* it, first burying the egg in the ground at a considerable depth, and then digging a cave or nest under it, by which about one-third of the lower end was exposed, and so lying under the egg and in contact with the lower end, which came, as it were, through the roof of the nest or burrow. The appearance of the egg, which I propose to send, corroborated this statement, for two-thirds of its length (the small end) was perfectly clean and white, and about one-third the large end was very much discoloured, and very greasy, evidently from contact with the body of the bird. The difference in the colour and condition of the ends of the egg was quite remarkable, and well defined by a circular line passing round the egg.'"

Mr. E. Layard has furnished Mr. Gould with the following information on the same subject forwarded to him by Mr. Webster, also resident at Hokianga:—"A fortnight ago," says that gentleman, "a native, out shooting Pigeons, discovered a Kivi's egg protruding out of a small hole at the root of a kauri tree; removing the egg, he put his arm to the elbow up the hole and got hold of the parent bird. An old native who professes to know something about them states that they lay but one egg at a time. The nest is merely a hole scraped out by the bird, and generally about the roots of a tree, where the ground is dry; the egg is covered with leaves and moss, the decomposition of which evolves heat sufficient to bring forth the young. The process takes six weeks. When hatched, the mother, by instinct, is at hand to attend to her offspring. The egg of the Apteryx is unusually heavy in proportion to the size of the female, being fully fourteen ounces and a half in weight."

MANTELL'S APTERYX.

MANTELL'S APTERYX (*Apteryx Mantelli*) is smaller than the above bird, the plumage darker and redder, the wing smaller, and formed of strong thick quills, and the face covered with long, straggling

hairs; the tarsus is longer, and scutellated in front, and the toes and claws shorter than in the *A. Australis*. The length of the body is twenty-three inches; the bill measures four, the tarsus two inches and three-quarters, and the centre toe, with claw, two inches and a half. An unmated female, in the London Zoological Gardens, several times laid an egg, in all about nine, and, according to Mr. Layard, manifested a strong desire to sit, placing herself upon the egg, and resisting all attempts to remove her from her position. This *Apteryx*, and the *A. Australis*, are regarded by Gould as belonging to the same species.

OWEN'S APTERYX.

OWEN'S APTERYX (*Apteryx Owenii*) has the face, head, and neck of a dull yellowish brown; the throat somewhat paler; all the upper surface is fulvous, transversely rayed with blackish brown, each individual feather being silvery brown at the base, darker brown in the middle, then crossed by a lunate mark of fulvous, to which succeeds an irregular mark of black, and terminated with fulvous; the feathers of the under surface are paler than on the upper, a circumstance which is caused by each feather being crossed by three rays of fulvous instead of two, and more largely tipped with that colour; the feathers of the thighs resemble those of the back; the bill is dull yellowish horn-colour; the feet and claws fleshy brown. The total length is eighteen inches; bill three inches and five-eighths, breadth at base two inches and a quarter; the middle toe and nail measure two inches and a half, and tarsi two inches and a quarter.

The above description is from a specimen sent to Mr. Gould in 1850; since then he has obtained several others, all of which came from the South Island of New Zealand. This bird, according to Mr. Gould, is rendered conspicuously different from the *Apteryx Australis*, with which it accords in size, by the irregular transverse barring of the entire plumage, which, together with its extreme density and hair-like appearance, gives it more the resemblance of a mammal than of a bird. It has a shorter, slenderer, and more curved bill, and the feathers also differ in structure, being broader throughout, especially at the tip, and of a loose, decomposed, and hair-like texture.

"In the spurs of the Southern Alps, on Cook's Straits, in the province of Nelson," says Dr. Hochstetter, "that is, in the higher wooded mountain-valleys of the Wairau chain, and westward of Blind Bay, in the wooded mountains between the Motucha and Aorere valleys, this species is still found in great numbers. During my stay in the province of Nelson I had two living examples, a male and a female; they were procured by some natives I sent out for the purpose in the upper wooded valleys of the river Slate, a confluent of the Aorere, in a country elevated from 2,000 to 3,000 feet above the sea-level."

As might naturally be expected, these interesting but defenceless birds are rapidly becoming extinct; a few, however, may still be found in the more unfrequented and thickly-wooded parts of the Northern Island of New Zealand. From the inhabited districts they have been completely extirpated; indeed, Dieffenbach tells us that during the eighteen months of his residence in New Zealand, notwithstanding the liberal rewards promised to the natives, he only succeeded in procuring a single skin, and even that was obtained from a European settler, who said that he procured it from Mongonui Station, to the northward of the Bay of Islands.

Among the localities where the Kivi is still obtainable may be mentioned Little Barrier Island, a small, wooded island in Hauraki Bay, near Auckland, which is evidently the top of a high mountain, rising some 2,383 feet above the level of the sea, and only approachable in the calmest weather.

There seems to be little difficulty in keeping these birds in a state of captivity, and in the Gardens of the London Zoological Society, in the Regent's Park, several specimens have been successfully exhibited. Their cage is simply a dark kennel, having in one corner a sufficient quantity of straw, among which the birds remain carefully hidden during the day. Should their keeper take

them forcibly from their retreat, they immediately run back again, as soon as they find themselves at liberty, and eagerly cover themselves as completely as possible. After sunset, however, they become quite lively and active, running about in all directions, and probing the soft earth with their beaks, much after the manner of a Woodcock. They readily devour finely-chopped mutton and earthworms, consuming of the first-mentioned article of diet almost half a pound a day.



THE NANDU, OR RHEA.

