



The
ROYAL
NATURAL
HISTORY

by

RICHARD LYDEKKER



THE ROYAL
NATURAL HISTORY



DESERT FINCH AND DESERT LARK.

THE ROYAL NATURAL HISTORY

EDITED BY

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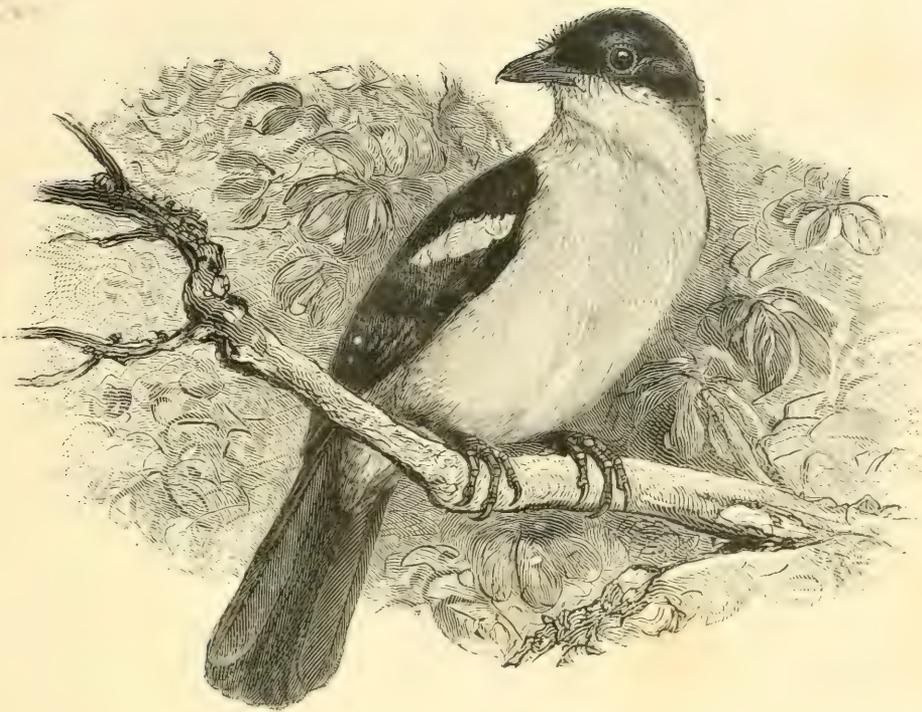
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|------|---|
| 343. | Line 7 from foot, for "five" read "nine." |
| 350. | The superb glossy starling (<i>Lamprocolius superbus</i>), figured on this page, is a native of East Africa, and is easily recognised by the white band across the chest; the mantle being steely green, and the upper part of the head and neck black. |
| 351. | Line 11 from foot, for "later on" read "p. 347"; line 4 from foot, for " <i>Eulabetes</i> " read " <i>Eulabes</i> ." |
| 363. | Line 10 from foot, for " <i>D. leucocephala</i> " read " <i>Dinemellia leucocephala</i> ." |
| 364. | First line, after "the" add "typical representative of a." |
| 376. | Transpose numbers 4 and 5 in Plate. |

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BIRDS.

CHAPTER I.

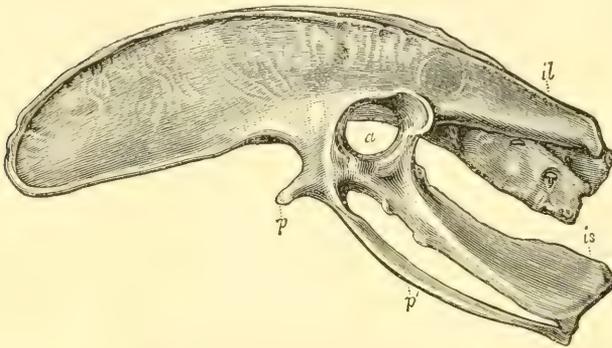
GENERAL CHARACTERISTICS,—Class **Aves**.

A TRAVELLER may in many parts of the world journey from one week's end to another without coming across a single Mammal or Reptile, but few indeed are the regions where bird-life, in some form, will not present itself more or less abundantly to his gaze; and in no country is this exuberance of bird-life, as contrasted with the apparent scarcity of Mammals and Reptiles, more remarkable than in the British Islands. This abundance is largely due to the great majority of Birds being diurnal in their habits, whereas most Mammals are nocturnal, but it is chiefly owing to the Birds being more numerous in most parts of the world, both as regards individuals and species. On this account alone Birds have always aroused a widespread interest even among those who pay no particular attention to Natural History; and in addition to it we have the beauty of their form, the gorgeous hues with which their plumage is so frequently adorned, and the power of melodious song with which so many members of the class are endowed. Then, again, the many interesting points connected with their habits, and more especially their conjugal affection and the care they bestow on their helpless young, have combined to aid in producing the universal enthusiasm for what have been most

appropriately designated "our feathered friends." As the result of this widespread popularity, the literature devoted to Birds is far more extensive than that relating to any other group of animals of equal size. And it may, perhaps, be questioned whether, in spite of their many undoubted claims to special interest, Birds have not attracted rather more than their fair share of attention; for, after all, the whole of the members of the class are wonderfully alike in general structure, even its most divergent representatives presenting no approach to the differences distinguishing nearly allied mammalian orders. It is to a great extent owing to this remarkable structural uniformity that such different views still exist as to the classification of Birds.

Distinctive Characters of Birds. Birds form a class in the Vertebrates ranking on the same level as the Mammalia, and technically known as Aves; and from the aforesaid structural uniformity of all its members, there is no difficulty in defining a Bird, nor is there any possibility of mistaking any other animal for a Bird. All living Birds, and so far as we know all fossil ones likewise, are sharply distinguished from every other creature by the possession of feathers; these

corresponding in essential structure to hairs, and being similarly developed from pits sunk in the superficial layer of the skin or epidermis. This is the grand and essential characteristic of Birds, most of their other peculiarities being shared by some of the other groups of Vertebrates, either living or extinct.



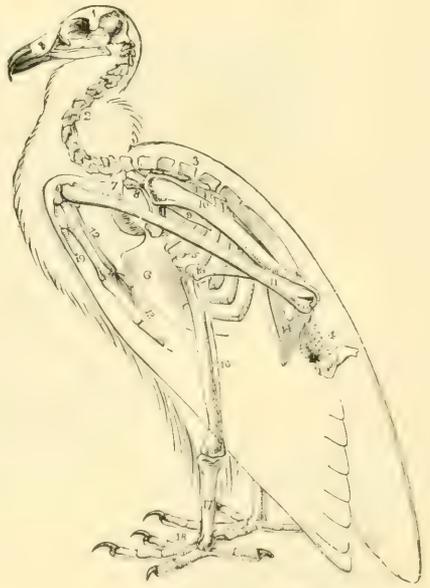
LEFT SIDE OF THE PELVIS OF THE KIWI.

il, haunch-bone or ilium; *p*, *p'*, pubis; *is*, ischium; *a*, cup for head of thigh-bone.—After Marsh.

Birds agree with Mammals in having a four-chambered heart and hot blood, and also in that the

blood is carried to the body by only a single great artery or aorta; but while in Mammals this aorta passes over the left branch of the windpipe or bronchus, in Birds it crosses the right. In producing their young from eggs laid by the female parent, Birds resemble not only the Egg-laying Mammals, but likewise most of the lower Vertebrates. All living members of the class possess two pairs of limbs; of which the hinder pair are always adapted either for walking or swimming, while the first pair are generally specially modified for flight, although in the flightless species they are small and more or less rudimentary. Except to a small degree in the penguins, they never subserve the purpose of walking, at least in the adult condition. The power of true flight, which is such an essential characteristic of the majority of Birds, is found elsewhere among Vertebrates only in the bats among Mammals, and the extinct pterodactyles among Reptiles. An especial peculiarity of Birds is the manner in which their whole structure is permeated by atmospheric air taken in through the windpipe. Thus, whereas in Mammals the lungs are enclosed in complete sacs (the pleuron), and

are freely suspended in the cavity of the chest, in the present class they are moulded to the form of the back of that cavity, while some of the great air-tubes pass completely through them, and thus carry the air to all parts of the body. In most Birds even the bones, which are hollow, are thus permeated by air; and in the dried state they show a small aperture (pneumatic foramen) by which the air-tube enters. It is in consequence of this arrangement that it is impossible to kill a "winged" bird by compressing its windpipe, the process of respiration being carried on by means of the air entering the broken end of the bone. In addition to the hollow bones, Birds also have a number of air-sacs disposed beneath the skin. Curiously enough, there appears to be no sort of relation between the power of flight of a bird and the degree of development of pneumaticity, as the aeration of the body and bones is called. The hornbills, for instance, which are poor and heavy fliers, have the whole of the bones, including the vertebræ, so hollowed that they are reduced to little more than shells, while in their not very distant cousin the rapid flying swift, the aeration is reduced to a minimum. Among swimming birds a similar difference may be observed, the gannet having a remarkably pneumatic skeleton and large air-sacs, while in the allied cormorants there are no air-sacs, and the bones are but slightly or not at all pneumatic. According to the old theory, the heated air in the sacs and hollow bones made the bird lighter than the medium in which it flew, and thus rendered flight easy; but, as Mr. Headley well observes, the sight of an eagle flying off with a lamb ought to convince anyone that the saving of a fraction of an ounce cannot make the slightest difference to its flight. Moreover, the swallow has all the bones solid. That the air-sacs aid to some extent in general respiration, and thus help in maintaining the high temperature of the blood in birds (reaching in some cases 112° F.) is probable, but this cannot be their sole function, and it is most likely that during flight, when a bird's breathing must be rapid, they are the chief agents in maintaining an equable temperature of the system. The function of the pneumaticity of the bones is not at present decided, and it would therefore be only entering on controversial matters to discuss it here. That one of the objects of the coat of feathers, which forms a most efficient insulator, is to assist in the maintenance of a uniform high temperature, cannot be doubted.

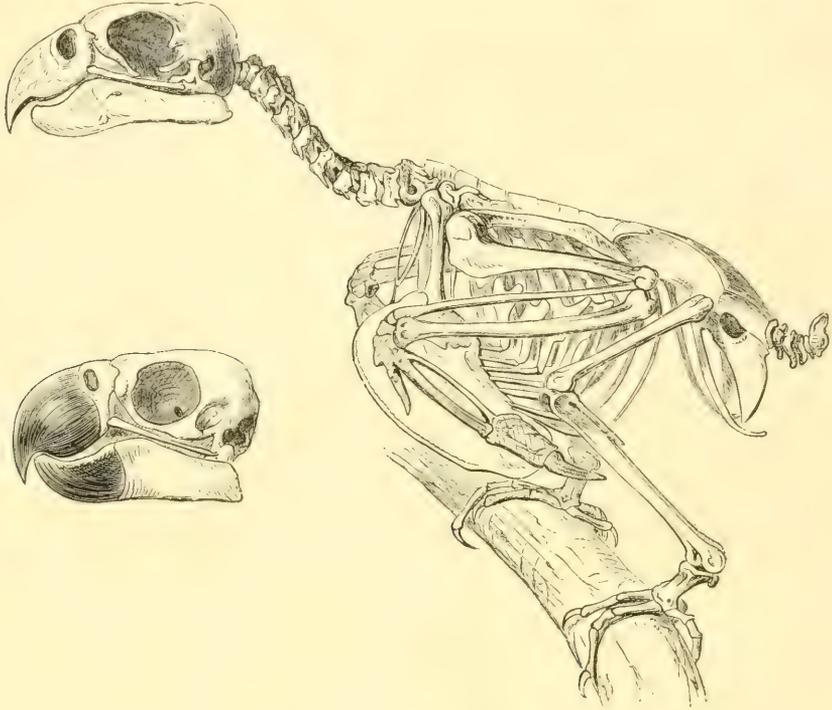


SKELETON OF VULTURE.

- 1, head; 2, neck; 3, back; 4, tail; 5, ribs; 6, breast-bone; 7, furcula; 8, metacoracoid; 9, thumb; 10, humerus; 11, ulna; 12, metacarpus; 13, phalanges; 14, pelvis; 15, femur; 16, tibia; 17, metatarsus or cannon-bone; 18, toes.

An important structural difference between Mammals and Birds is to be found in the absence in the latter of the partition or diaphragm, which in the former separates the cavity of the chest containing the heart and lungs from that of the abdomen.

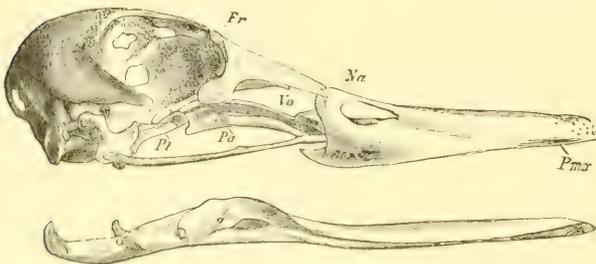
Skeleton. As the skeleton of Birds affords many important characters, whereby the class is distinguished from Mammals, it is advisable to enter at once upon its consideration. In the first place, the skull of a bird, as shown in the figures given later on in the chapter, differs from that of a mammal



SKELETON OF PARROT AND SKULL OF COCKATOO.

in that it is attached to the first joint of the backbone by a single knob or condyle, instead of by two such condyles. Secondly, each half of the lower jaw is composed of several pieces, instead of but one; and instead of the lower jaw articulating

directly with what is known as the squamosal region of the brain-case, it does so by the intervention of a separate bone, termed, from its form, the quadrate, the position of which is indicated in the accompanying figure. It may be mentioned here that in all existing Birds both jaws are encased in horn, and are devoid of teeth; while the two halves

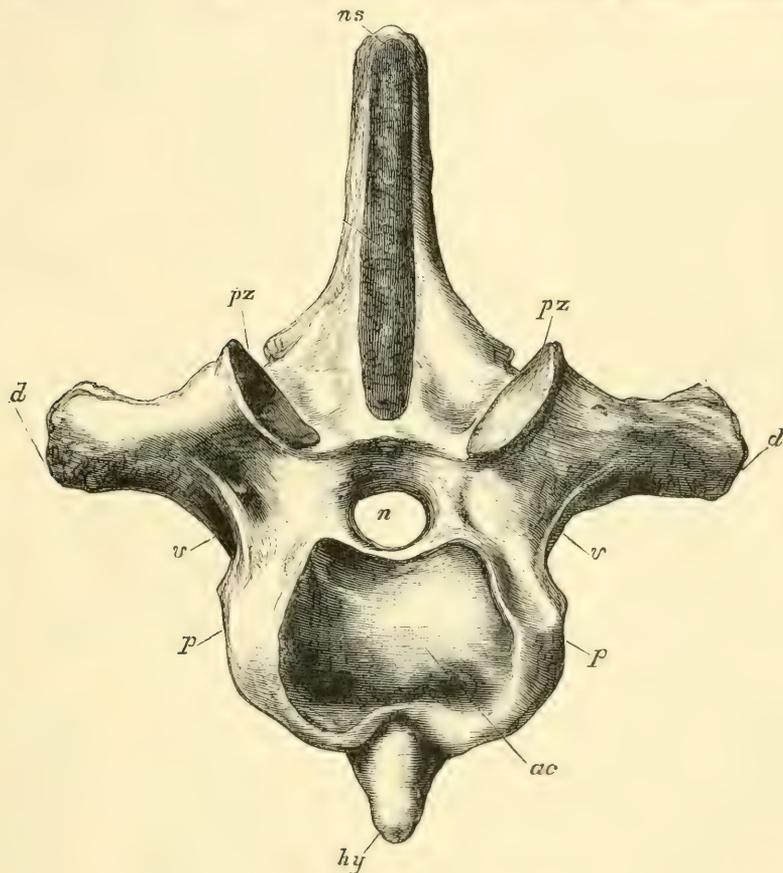


SIDE VIEW OF SKULL OF TEAL, WITH THE LOWER JAW DISPLACED.

The bone immediately to the left of the one marked *Pt* is the quadrate. (From Huxley, *Proc. Zool. Soc.*, 1867.)

of the lower jaw are completely soldered together by bone at their junction, or symphysis. Certain extinct Birds had, however, a full series of teeth, and the two halves of the lower jaw separate.

As regards the backbone, existing Birds differ from Mammals in that the bodies of the vertebræ, at least in the region of the neck, are articulated to one another by saddle-shaped surfaces, instead of by a cup-and-ball joint or two nearly flat surfaces; and there is no constancy in the number of joints in the neck. A further peculiarity is that a number of the vertebræ of the back, together with some of those of the tail, are solidly united with the proper sacrum, while the whole long series of welded vertebræ are themselves as firmly attached to the

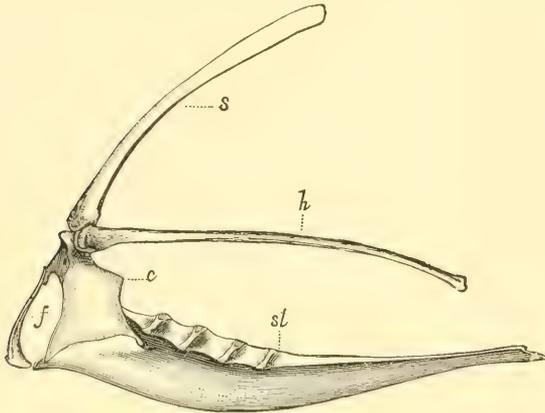


ANTERIOR ASPECT OF THE DORSAL VERTEBRA OF A MOA (*Pachyornis*.)

ns, upper or neural spine; *n*, neural canal; *pz*, prezygapophysis; *d*, transverse process; *v*, pedicle of arch; *p*, facet for rib; *ac*, anterior surface of body or centrum; *hy*, lower or hæmal spine.—After Owen.

haunch-bones of the pelvis. In all living Birds the bones of the tail are very few in number, and terminate in a triangular bone (as seen in our figure of the skeleton of a parrot), termed the ploughshare-bone. It is to this region of the body that the tail-feathers of a bird, commonly called the tail, are attached: and it will thus be apparent that the so-called tail of a bird does not correspond with the tail of a mammal. In the earliest known bird the tail was, however, long, and composed of a number of vertebræ, each carrying a pair of feathers. The pelvis of a bird is remarkable for the great elongation of the haunch-bones, and also for the circumstance that the portion known as the pubis (*p*, *p'*) is

directed backward parallel with the element termed the ischium; the three elements being united together as in Mammals but differing from them, with two exceptions, in that neither the ischium nor the pubis unites with its fellow of the opposite side in the middle line. Moreover, the cup in the pelvis for the head of the thigh-bone is always open at the base. The firm union of the haunch-bones with such a large portion of the backbone is necessary to afford a solid basis of support for the rest of the skeleton in flight.



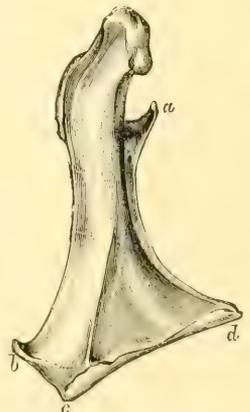
LEFT SIDE OF SHOULDER AND BREAST-BONES OF A FLIGHTLESS BIRD.

s, blade-bone or scapula; *c*, metacoracoid; *h*, arm-bone or humerus; *f*, furcula; *st*, breast-bone or sternum.—After Marsh.

well-developed, and united together to form a V or U-shaped bone, now known as the "merry-thought," or furcula (*f*); this furcula generally articulating with a process on the metacoracoid (*a*), and also with the anterior end of the breast-bone. The breast-bone in flying Birds is provided with a strong keel up the middle of its inferior surface, as shown in the figure of the skeleton of a parrot on p. 292, in order to afford support for the powerful muscles moving the wing; but in flightless Birds, as in the figure on this page, it is smooth and rounded. To the sides of the upper part of the breast-bone are attached the lower segments of the ribs; the ribs themselves being few in number, and distinguished from those of Mammals by the presence of oblique (uncinate) processes projecting from their hinder borders.

With regard to the limbs, the bones of a bird's wing correspond generally to those of the arm or fore-leg of a mammal; the arm-bone or humerus having distinct condyles (*a*, *b*) for the articulation of the bones of the fore-arm (radius and ulna); and being sometimes furnished with a projecting process above the outermost of these two condyles. The two bones of the fore-arm always remain separate from

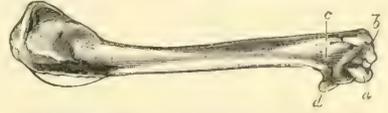
Equally essential is a solid union between the bones of the shoulder and the breast-bone. Accordingly, we find that, as in the Egg-laying Mammals the blade-bone or scapula (*s*) is connected with the breast-bone (*st*), by a metacoracoid (*c*); the scapula and metacoracoid thus jointly forming the cup for the articulation of the head of the arm-bone or humerus (*h*). Although in flightless Birds the metacoracoid is short and broad, in other species it is more or less elongated; and in either case its lower expanded end is received in a groove on the summit of the breast-bone. Usually the collar-bones, or clavicles, are



FRONT SURFACE OF THE LEFT METACORACOID OF A FLYING BIRD.

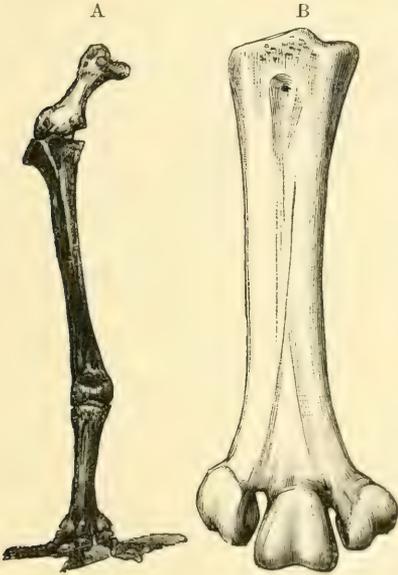
a, process for articulation of furcula; *b*, *c*, *d*, surface for junction with breast-bone.

one another. In the wrist the numerous bones found in Mammals are, however, reduced to two; and the metacarpus and hand are flattened and specially modified. Thus there are never more than three digits, which are usually without claws, although among recent birds two may be thus armed. The thumb, or first digit, is represented merely by one or two joints (as shown in the skeleton on p. 292), and carries the so-called bastard-wing; while the other two digits represent the index and middle fingers of the human hand. Their respective metacarpals, as seen in the figure cited, are united at their two ends so as to form a single bone; while the index finger has two flattened joints, and the third finger (not present in the figure) but one.



FRONT VIEW OF THE RIGHT HUMERUS
OF A GULL.

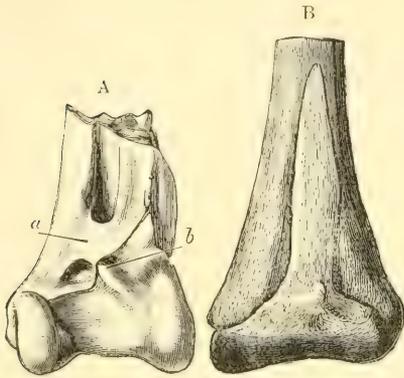
In the hind-limb there is a still wider departure from the Mammalian type. The uppermost bone in a bird's leg (A of the accompanying figure) is the thigh-bone, or femur; below this comes the tibia, or larger bone of the lower leg, on the outer side of which is a small splint (not shown in the figure) representing the fibula. Below the tibia comes another long bone, terminating (except in the ostrich, where they are reduced to two) in three pulley-like surfaces, known as trochleæ, to which are articulated the toe-bones. Obviously, then, this third long bone corresponds to the metatarsus of a mammal, consisting in fact of the three middle metatarsals of the typical five-toed limb welded together, in the same manner as two such metatarsals are united in the hind-limb of a ruminant mammal. It may, therefore, be called either the metatarsus or the cannon-bone. The reader will, however, now ask what has become of the ankle or tarsus in the bird's leg. To this it may be replied that its upper bones have united to the lower end of the tibia; while the lower row has joined the upper end of the cannon-bone. The figure on p. 296 exhibits the lower end of the tibia of an adult crane and of a young ostrich; and it will be seen that in the latter the upper ankle-bone is still distinct, while in the former it has become completely



A, BONES OF THE RIGHT LEG OF A MOA;
B, CANNON-BONE OF SAME ON A
LARGER SCALE.

united with the tibia. A precisely similar state of things takes place in the formation of the cannon-bone. It will, therefore, be apparent that the tibia of a bird corresponds to the tibia, *plus* the upper half of the ankle, of a mammal; while the cannon-bone represents the metatarsus, *plus* the lower half of the ankle. Hence, while the ankle-joint in a mammal occurs between the tibia and the upper row of ankle-bones, in a bird it is placed between the upper and lower rows of the ankle. The bony bridge seen at *a* in the tibia of the crane is very commonly present in birds; it acts as a pulley for the tendons of the muscles of the front of the leg

which pass beneath. Such pulleys enable the fleshy portions of the muscles to be placed high up in the limb, and thus cause the centre of gravity of the body to be near the wings, an arrangement essential for flight. In addition to the three toes articulating with the lower end of the cannon-bone, most birds have another



LOWER END OF THE LEFT TIBIA OF A CRANE (A), AND A YOUNG OSTRICH (B).

toe, corresponding to the first or great toe of the human foot, of which the metacarpal is loosely attached to a facet on the inner edge of the hinder surface of the cannon-bone—as shown in the figure of the cannon-bone of a buzzard in our fourth volume. No bird has any trace of the fifth toe. The number of joints in each toe, in place of not exceeding three as in ordinary mammals, increases regularly from the first to the fourth toe.

Skull.

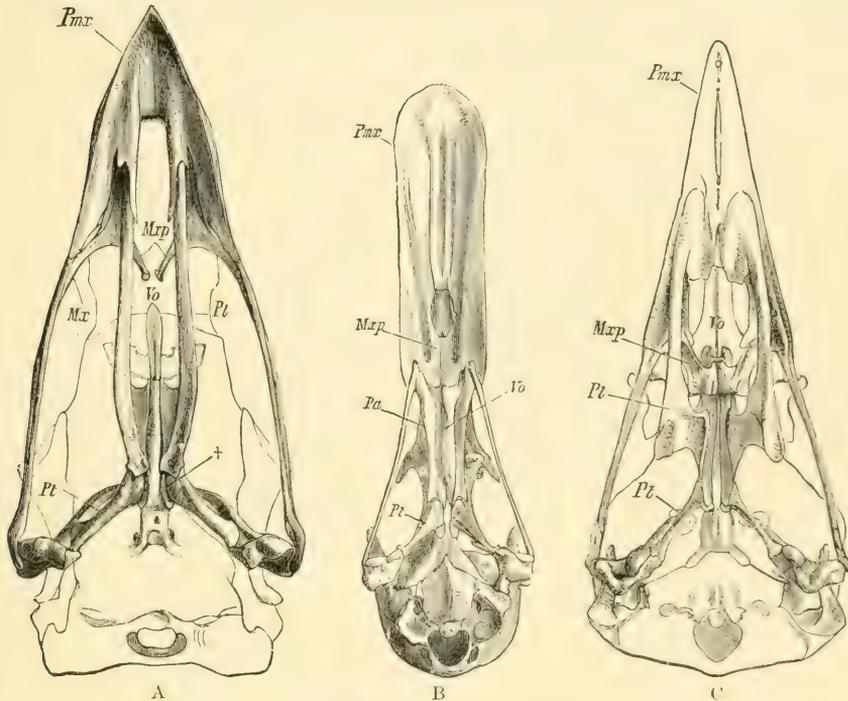
As the structure of the base of the skull is of some importance in classification, a few words are necessary on this point. In the first place, the skull of a bird is characterised by the great size

of the sockets for the eyes, which are separated from one another merely by a thin bony partition. The aperture for the nostrils (immediately below *Na* in the figure on p. 292) may be either short and rounded, when the skull is said to be *holorhinal* (as in that figure); or they may form elongated slits, as in a pigeon, when the condition is termed *schizorhinal*. In all Birds most of the component bones of the skull are completely united together, without any trace of the original lines of division, in the adult state; and in ornithology it is usual to apply the terms upper and lower mandible to the two parts of the beak.

With regard to the bones of the palate, the introduction of a number of technical terms is unavoidable. In the middle of the hinder part of the lower surface of a bird's skull can be seen a pointed rod of bone, known as the *sphenoidal rostrum*, which may carry, as in (A) of the figure, a pair of *basipterygoid facets* (†). In advance of this is a single or double bone, termed the *vomer* (*Vo*). On the two sides of this central axis are two pairs of slender bones, of which the hinder are termed *pterygoids* (*Pt*), and articulate with the basipterygoid processes when present; while the front pair are named *palatines* (*Pl*). From the sides of the upper jaw or *maxilla* (*Mr*), are given off two *maxillo-palatine processes* (*Mrp*), projecting in the middle line towards the vomer. Now when the vomer, as in the fowl and capercaillie (A) is pointed in front, while the maxillo-palatines remain separate both from it and from one another, the skull is said to be *schizognathous* (cleft palate). When, on the other hand, as in the duck (B), the maxillo-palatines unite in the middle line, so as to form a bridge in front of the vomer, the construction is termed *desmognathous* (bridged palate). In a third modification, as exemplified in the raven (B) and all other living passerine birds, the maxillo-palatines, although extending beneath the vomer, do not unite either with that bone or with one another, while the vomer itself is expanded and abruptly truncated in front: this arrangement being termed *ægithognathous* (passerine-

palate). Various minor modifications of these three types exist, but a little practice will enable the student to determine to which of the three any given skull conforms. A fourth modification, met with only among the ostrich-like birds and the South American tinamus, need not be referred to till a later chapter.

Before leaving the subject of the skull, it may be mentioned that the outer coat or "white" of the eye of a bird contains a movable ring of overlapping bones surrounding the pupil and iris, which by their contraction or expansion are con-



UNDER VIEW OF SKULL OF CAPERCAILLIE (A), DUCK (B), AND RAVEN (C).

Mxp, maxillo-palatine; *Vo*, vomer; *Pa*, palatine; *Pt*, pterygoid; †, basipterygoid facet. (From *Proc. Zool. Soc.*, 1867.—After Huxley.)

sidered to alter the degree of convexity of the aqueous humour and cornea, and thus to render the eye focally adapted to the constantly varying distance of objects during flight.

External Characters. When clothed with its feathers, the bodily conformation of an ordinary bird is that best adapted for cleaving the air with the least possible resistance: the head being more or less sharpened, the body gradually swelling to a point some distance in advance of the middle, and then as rapidly decreasing in girth, while the feathers are all directed from the head towards the tail. In those birds in which the neck is not unduly elongated the whole contour is, indeed, spindle-shaped, and may be compared to two cones placed base to base at the thickest part of the body. It is essential to the exigencies of flight that the centre of gravity should be on the lower aspect of the body, as nearly as possible immediately below the points of suspension by the wings; and, in order to ensure

this, there is the concentration of muscles and other organs in this region, to which some allusion has been already made. Not only are the fleshy portions of the muscles of the legs mainly confined to the upper portions of these limbs, but the muscles which elevate the wings are actually placed on the under instead of on the upper surface of the body. In the breast of a flying bird the great superficial muscle, known as the pectoralis major, is for the purpose of depressing the wing; beneath this is, however, a second muscle—the pectoralis minor—of which the function is to raise the wing-bone, or humerus. This is effected by the muscle terminating in a tendon, which passes through a pulley over the head of the scapula

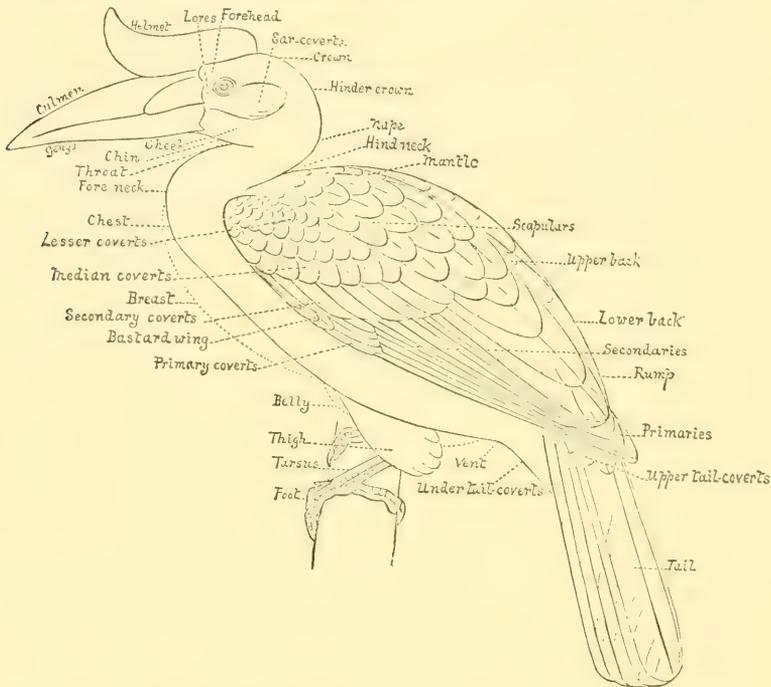


DIAGRAM OF A BIRD, TO ILLUSTRATE THE ARRANGEMENT OF THE PLUMAGE, ETC.¹

and metacoracoid, and then being attached on the upper surface of the humerus: that bone being accordingly elevated when the muscle contracts. The same tendency to the concentration of structures is exhibited by the organ of voice (syrinx) of a bird being placed within the chest, where the windpipe divides into the two bronchi, instead of, as in Mammals, immediately beneath the lower jaw.

An important external feature in Birds is the frequent presence of a gland termed the oil-gland, on the upper surface of the rump, the function of which is to secrete oil for the lubrication of the feathers. This gland, which is most developed in aquatic birds, may be absent, and when present may be either naked or crowned with a tuft of feathers.

¹ For this cut the Editor is indebted to Mr. Rowland Ward, in whose *Sportsman's Handbook* it originally appeared. Acknowledgments are likewise due to the same gentleman for the copyright of the head of the Musk-ox on p. 210 of Vol. II., which is taken from a photograph of a specimen shot by Lord Lonsdale and mounted by Mr. Ward.

Ornithologists have devised a number of terms to indicate the different parts of a body of a bird, several of which are located in the accompanying diagram; the others it will be unnecessary to mention here. It may be observed, however, that the ears of Birds are unprovided with external conchs, merely opening flat on the sides of the head, usually a little behind and below the eyes. The eyes, which are in most cases placed laterally and near the middle of the head, are provided with a third eyelid, or nictitating membrane, which can be drawn obliquely like a shutter over the eyeball, while the proper eyelids remain open; as may be observed in a captive owl or eagle, when the glistening white membrane will be seen from time to time to sweep across the eye with extreme rapidity.

The beaks of birds, which, as we have said, are always encased in horn or leathery skin, have different terms applied to them, according to their relative length and form; the meaning of most of such terms, as *fissirostral*, *dentirostral*, *conirostral*, etc., being self-apparent. A horny investment is also generally present on such portions of the lower part of the legs as are devoid of feathers: although in some cases, as in the ducks, this is replaced by a more or less leathery skin. The horny covering of the metatarsus may consist of small pieces, with the edges in apposition, as in the plovers, when it is said to be *reticulate*; but frequently the front surface, as in the fowls, has a number of broad overlapping plates, when it is termed *scutate*. Occasionally each side is invested by a single greave-like plate, meeting its fellow in a prominent ridge at the back.

The feathers of birds being all-important need a somewhat fuller notice. A feather in its most complete state of development consists of a main stem, and a secondary stem, or *after-shaft*; but the latter is frequently wanting. The base of the main stem is formed by the hollow horny quill, the lower end of which is pointed and inserted into the skin. The upper part of the quill passes into the shaft, or *rachis*, at a point marked by a small aperture termed the upper *umbilicus*. The shaft is four-sided, elastic, pithy, and less horny than the quill; and gradually tapers at its extremity to a fine point. On either side of the shaft are the two *webs*, collectively forming the *vane* of the feather. Each web or half of the vane, one of which is generally considerably wider than the other, is composed of a series of flattened plates closely applied to one another, and diverging from the shaft at an open angle, each plate terminating in a point. These plates form the *barbs*, and they are held together by *barbules*, given off in the same manner as are the barbs from the stem; while the barbules may again give off *hooklets*. The after-shaft is, when fully developed, a miniature of the main stem, from which it is given off at the junction of the quill with the shaft. Such is the structure of a typical feather; but the soft feathers known as *down* have the stem short and weak, or even wanting, while the barbs are soft and not held together by fully-formed barbules and hooklets. Sometimes the ends of such feathers break up into powder, and they may then be spoken of as *powder-down feathers*. In another type of feather the vane is rudimentary, and the whole structure then becomes more or less hair-like; to such the term *thread-feathers* is applicable. Finally, the feathers covering the body and concealing the underlying down are conveniently referred to as the *contour-feathers*.

Instead of being evenly distributed over the body of a bird, the feathers grow

from certain well-defined tracts, between which are bare spaces. Although such tracts have received distinct names, and are of some importance in classification, it will suffice to mention their mere existence; and we pass on to the consideration of the names applied to the feathers of the tail and wings.

As shown in the diagram on p. 298, the tail-feathers, which are very generally twelve in number, are termed *rectrices*; and are usually firm and fully developed. Above and below the rectrices are the upper and under *tail-coverts*; although generally small and unimportant, in the peacock the upper tail-coverts attain an extraordinary development, and constitute what is commonly designated the tail. Premising that the feathers clothing the shoulders are termed *scapulars*, and those between them *inter-scapulars*, we pass on to the consideration of the feathers of the wings. First of all, we have the little group of feathers forming the *bastard-wing*, or *alula*, which are carried by the first digit, or thumb, and lie on the front border of the back of the wing. Next, we have the *flight-feathers*, *remiges*, or *quills*, which arise from the bones of the arm and pinion (or hand, exclusive of the thumb); all are strong, firm feathers, giving rise to the main contour of the wing. Such of the remiges as take their origin from the pinion are termed *primaries*; while those attached to the fore-arm (ulna) and upper arm (humerus) are entitled *secondaries*, though the remiges arising from the humerus used to be distinguished as *tertiaries*, and the term *secondaries* confined to those attached to the ulna. The primaries are the firmest and stiffest of the wing-feathers, and are very generally either nine or ten in number. As the rectrices of the tail have tail-coverts, so the remiges have *wing-coverts*, both above and below. Of the upper wing-coverts, we have first the *primary coverts* overlying the primaries; while the secondaries are overlain by three series, respectively known as the *greater*, *median*, and *lesser upper secondary wing-coverts*. Of these the greater coverts are the largest and the most important in classification. The *under wing-coverts*, which are less important in classification, are likewise divided into a primary and secondary series.

Change of Plumage. When first hatched, Birds are covered with some kind of down, very scanty in those which are reared in nests, but thick in all those able to run about at the time of birth. The true feathers are, however, soon developed, those of the wings and tail being usually the first to make their appearance, and the rapidity with which feathers grow is one of the most remarkable features of Birds. In order to preserve the plumage in good condition, it is essential that it should be renewed at least once a year. This renewal of the feathers is termed moulting, and frequently takes place twice during the year; while in the ptarmigan there are three moults. The chief moult usually takes place soon after the breeding-season; but in those birds which, like ducks, have a special breeding-plumage, a second moult takes place previous to that period. In the ptarmigan the third moult is for the assumption of the white winter dress. Usually the wing-feathers are shed in pairs one after another; but among the ducks, which are enabled to conceal themselves among water plants, and can thus protect themselves without flight, the shedding of all the wing-feathers is frequently almost simultaneous.

Eggs. As already mentioned, birds produce their young by means of eggs, covered with a hard calcareous shell, often remarkable for the beauty of its coloration. Into the structure of an egg it will be quite unnecessary to enter in this work; but the following remarks, chiefly taken from the descriptive account of a series of some of the most remarkable forms in the central hall of the British Museum, will be found of general interest. Although the number of eggs laid and incubated together is generally pretty constant in each kind of bird, yet there is great specific variation in this respect. The Manx shearwater, for instance, lays but a single egg, while clutches of the long-tailed tit and red-legged partridge may contain from nine to twelve eggs. In form, eggs vary from an almost spherical shape, as in owls, to different modifications of the elliptical or oval. The latter shape, in which one end is smaller and more pointed than the other, although far from being universal, is decidedly the most common; this conical shape allowing a larger number of eggs to be accommodated in a circular nest than would otherwise be possible; and it may be noticed that, when only a pair of eggs is laid, this form is but seldom assumed. Such eggs as narrow very rapidly, and thus take a pear-shaped form, mainly pertain to the wading-birds and their terrestrial allies the plovers, of the order *Limicole*; four of these being laid in a nest. Their size being large in proportion to the bulk of the bird by whom they are laid, their position in the nest, with their pointed ends meeting together in the centre, causes them to occupy the smallest possible amount of space. Sea-birds, like the guillemot and razorbill, which lay one or two eggs on barren ledges of rock, likewise have them pointed, as being much less liable to roll than would be the case if they were spherical.

Although the size of the eggs generally varies proportionately to that of the parent bird, yet this is by no means invariably the case; and it appears that in birds of which the young are hatched in a helpless condition, the eggs are relatively smaller than in those in which the young come into the world fully fledged. Moreover, it is the birds that have helpless offspring that usually make the most carefully constructed nests; while those that have fully fledged young lay their eggs in very rude nests or on the bare ground. As examples of birds of equal size, laying differently sized eggs, may be mentioned the curlew and the raven; while the bird which has the relatively smallest egg is the cuckoo, and that with the largest the kiwi.

The texture of the outer surface of the shell is liable to much variation, tinamus and kingfishers laying smooth and porcellaneous eggs, while those of the ibises and ducks are dull and chalky, those of the flamingos coated with a calcareous outer film, and those of the emu rough and pitted. As regards coloration, no relation can be traced between eggs and the birds by which they are laid; and it is probable that originally Birds resembled Reptiles in laying white eggs, this want of colour being retained, or perhaps reacquired, in the eggs of the majority of birds which lay in holes. The larger number of eggs are, however, variously coloured by the deposition of pigment on or near the outer surface of the shell. The colour (as in the tinamus) may be either uniform over the whole surface, or it may take the form of irregular washes, blotches, lines, or more or less nearly circular spots, upon either a white or uniformly-coloured ground.

Very little is, however, at present understood with regard to the signification of egg-coloration. Frequently the different species of a group lay very similarly coloured eggs, as is exemplified by the warblers and buntings; but this is by no means invariably the case, as is well shown by the different members of the thrush family. In many cases the coloration of the eggs is evidently adapted to the hue of their natural surroundings, as is well exemplified by sandpipers, dunlins, plovers, and their allies, and likewise by pheasants and partridges.

Migration. Since no bird hibernates, while a large number breed in regions where they could not possibly exist during the cold winter months, it is essential that they should migrate to warmer regions in which to pass that season of the year. Such migrations may be very partial, as is the case with many British species, when the individuals passing the summer in the more northern parts of the country come further south during the winter; while those from the area into which the immigrants arrive likewise move southwards. From such partial migrations there is a gradual transition to complete migrations, when the birds of one country travel to a far distant land for the winter. As the great masses of land enjoying a cold climate are mainly confined to the Northern Hemisphere, it is obvious that bird migrations must take place from south to north, and the following general laws of migration are now accepted. With the exception of purely tropical species, every bird breeds in the coldest or most northern part of its range; such nesting-grounds being generally reached by a horizontal migration, although in a few instances birds may ascend mountains until they meet with the required degree of temperature. This northerly migration is always for the purpose of breeding, while the southward return is for food and warmth. Those species which go furthest north often also range furthest to the south; while every species has its particular period of migration. Finally, no species ever breeds during its sojourn in the southern portion of its migratory area.

It would be quite out of place to enter into any discussion as to the origin of this migratory instinct; but it may be mentioned that as the young frequently make the autumn migration unattended by the old, it is quite evident that the journey is made independently of any knowledge of the route. Moreover, as most migrations take place in the night, it is clear that this alone will preclude any guidance of the host by landmarks. Then, again, from the circumstance that during astronomical observations flights of birds have been seen crossing the moon's disc at an immense elevation above the earth, there is good reason to believe that at least many migrations take place at heights whence the configuration of the continents and oceans would be invisible even during the day. Nevertheless, it appears that there are certain definite lines along which vast numbers of birds, subject to conditions of weather, habitually migrate; one of these trunk-routes passing through the island of Heligoland and along the western coast of Europe.

Distribution. Although, from their power of flight and migratory habits, it might seem that Birds would have no definite distributional areas, yet this is by no means the case; and the different zoological regions into which the world is now mapped out were originally defined from the various groups of Birds

by which they are inhabited. For instance, while the Palearctic region, that is to say, the greater part of Europe and Asia north of the line of the Himalaya, is characterised by the sole possession of the capercaillie, and its abundance of grouse, buntings, etc., North America is the sole home of the turkey, while humming-birds are mainly characteristic of South and Central America, as are birds of paradise, lyre-birds, and cockatoos of the Australasian region. Many birds, especially some of the humming-birds, have indeed a very local distribution; and, as might have been expected, the various groups of flightless Birds are now respectively confined to particular continents and islands. It would be impossible to pursue the subject further in the space available, but the reader will be enabled to gather many of the leading facts of avian distribution in the course of our description of the various groups.

As regards their geological distribution, it may be mentioned that most of the birds from the Tertiary formations are more or less closely allied to existing types. When, however, we reach the antecedent Cretaceous (chalk) epoch, we find that at least several of the birds were furnished with teeth; while in the still older Jurassic or Oolitic epoch the one definitely known bird (*Archæopteryx*) was not only furnished with teeth, but had a long tapering tail, and exhibited several other features indicative of reptilian affinity. While Birds present no sort of relationship to Mammals, they show manifest indications of being nearly allied to certain extinct groups of Reptiles; but the nature of that relationship can be best indicated in our consideration of those groups.

Classification. On no subject is there greater diversity of views among zoologists than with regard to the classification of Birds; scarcely any two ornithologists being in accord on this point. To a great extent this is owing to that structural uniformity among the members of the class to which reference has been already made, which renders it almost impossible to determine what features should be regarded as of primary importance. With such conflicting views it is inevitable that schemes of classification are to be counted almost by the dozen, and scarcely a year passes without one or more new ones being proposed. As it is unlikely that any one of these latter classifications will be permanently accepted, it has been thought advisable, in a popular work of the present nature, to revert to a modification of a scheme proposed some years ago by Dr. Selater. Including certain extinct groups, the class, according to this scheme, may be divided into the following twenty-five groups, of which the first twenty-two may be reckoned orders—such orders, be it understood, being for the most part far less distinct from one another than are those of Mammals.

ORDERS OF BIRDS.

1. PASSERES—Perching Birds.
2. PICARLE—Woodpeckers, Cuckoos, Hornbills, etc.
3. PSITTACI—Parrots.
4. STRIGES—Owls.
5. PANDIONES—Ospreys.
6. ACCIPITRES—Eagles, Falcons, Vultures, etc.

7. STEGANOPODES—Pelicans, Cormorants, and Gannets.
8. HERODIONES—Hérons and Storks.
9. ODONTOGLOSSI—Flamingos.
10. ANSERES—Ducks, Geese, and Swans.
11. PALAMEDEÆ—Screamers.
12. COLUMBÆ—Pigeons, Dodo, and Sand-Grouse.
13. GALLINÆ—Fowls and Game-Birds.
14. FULICARÆ—Rails and Coots.
15. ALECTORIDES—Cranes and Bustards.
16. LIMICOLÆ—Plovers, Curlews, Snipe, etc.
17. GAVIÆ—Gulls and Terns.
18. TUBINARES—Petrels and Albatrosses.
19. PYGOPODES—Divers, Auks, and Grebes.
20. IMPENNES—Penguins.
21. ODONTORNITHES—Toothed Birds (extinct).
22. CRYPTURI—Tinamus.
23. STEREORNITHES—Patagonian Flightless Birds (extinct).
24. RATITÆ—Ostriches, Emus, Cassowaris, etc.
25. SAURURÆ—Long-Tailed Birds (extinct).

Of these groups the first twenty-two, which are reckoned as orders, are brigaded together to form the subclass of Carinate Birds (*Carinatae*), the great majority of which possess the power of flight, and have a strong keel (*carina*) to the breast-bone. The twenty-fourth group, or *Ratitæ*, constitutes, on the other hand, a second subclass, characterised by the absence of a keel to the breast-bone, and the loss of the power of flight: while the extinct long-tailed birds (group 25) form a third main division differing from all the others by the retention of the long reptilian tail.

The number of existing species of birds being in all probability considerably over ten thousand, it will be obvious that in the space at our command the various groups must be treated much more briefly than were the Mammals; and in many instances we shall be able to allude only to the families, without referring to the genera, and in some cases not even the whole of the former are mentioned.

It will be noticed that in the course of this Introduction practically nothing has been said as to the anatomy of the soft parts of birds; for this we must refer the reader to other works.

CHAPTER II.

THE PERCHING BIRDS,—Order PASSERES.

CROWS TO HONEY-CREEPERS.

Families *CORVIDÆ* to *CEREBIDÆ*.

THE order of Passeres, which includes by far the great majority of existing birds, and especially those popularly termed song-birds, may be regarded as occupying a position analogous to that held by lizards among the Reptiles, and by the bony fishes in the Fishes, all its members being more or less specialised and highly organised. On this account the group is now, by general consent, regarded as the highest in the class. All these birds are characterised by having the palate constructed on what is termed the agithognathous modification, the structure of which is described and illustrated on p. 301. They are further distinguished by producing their young in a helpless and nearly naked condition, having merely a few patches of down scattered here and there over the body. In the skeleton the slender metatarsus has its three nearly equalised condyles placed almost in the same transverse line; while the arm-bone, or humerus, has a well-marked bifurcate process at the outer sides of its lower end; and, as a minor character, it may be mentioned that the breast-bone has but a single notch. The first toe is always present, and is mobile and directed backwards, in addition to being worked by a muscle independently of the other digits. A covering of feathers invests the legs as far down as the ankle-joint. There are usually twelve feathers in the tail; while the primary quills of the wings vary in number from nine to ten, the latter being the usual complement among the typical members of the order.

With three exceptions, the perching birds of the Old World belong to a section characterised by having the intrinsic muscles of the syrinx, or organ of voice, attached to the cords of the open rings of the bronchial tube, and technically termed the *Aeromyodi*. The Indian members of the order, provided with ten primary quills in the wings, may be divided, according to an arrangement suggested by Mr. Oates, into five groups. In the first of these the nestling resembles that of the adult female: this is likewise true of the second group, in which the coloration of the young bird is more brilliant than that of its parent, being in the Indian forms generally suffused with yellow. On the other hand, in the third group, the nestling is transversely barred; while in the fourth it is striated; and in the fifth group the nestling-plumage is either mottled or squamated.

Although certain species of the perching birds, such as the snow-bunting and the sand-marten, have a circumpolar distribution, numerous genera of this order

are restricted to the New World; while in spite of the fact that many species, as well as families, range across the whole of the north temperate parts of the Old World, from the British Isles to Japan, comparatively few families can be termed strictly cosmopolitan. Among those families, which are variously represented in almost every region of the globe, may be ranked the finch tribe, the swallows, and the true crows. For lustre of plumage and striking combinations of colour, the perching birds of the Indo-Malayan region excel all others: but South America possesses a larger and more varied assortment of these birds. Among the number, tanagers and chatterers form specially interesting groups. While the mocking-birds, represented by closely allied species in both the northern and southern divisions of the New World, have the best claim to be considered the finest songsters in the entire order, in Europe it is probable that the blue thrush possesses the most beautiful notes of all the passerines.

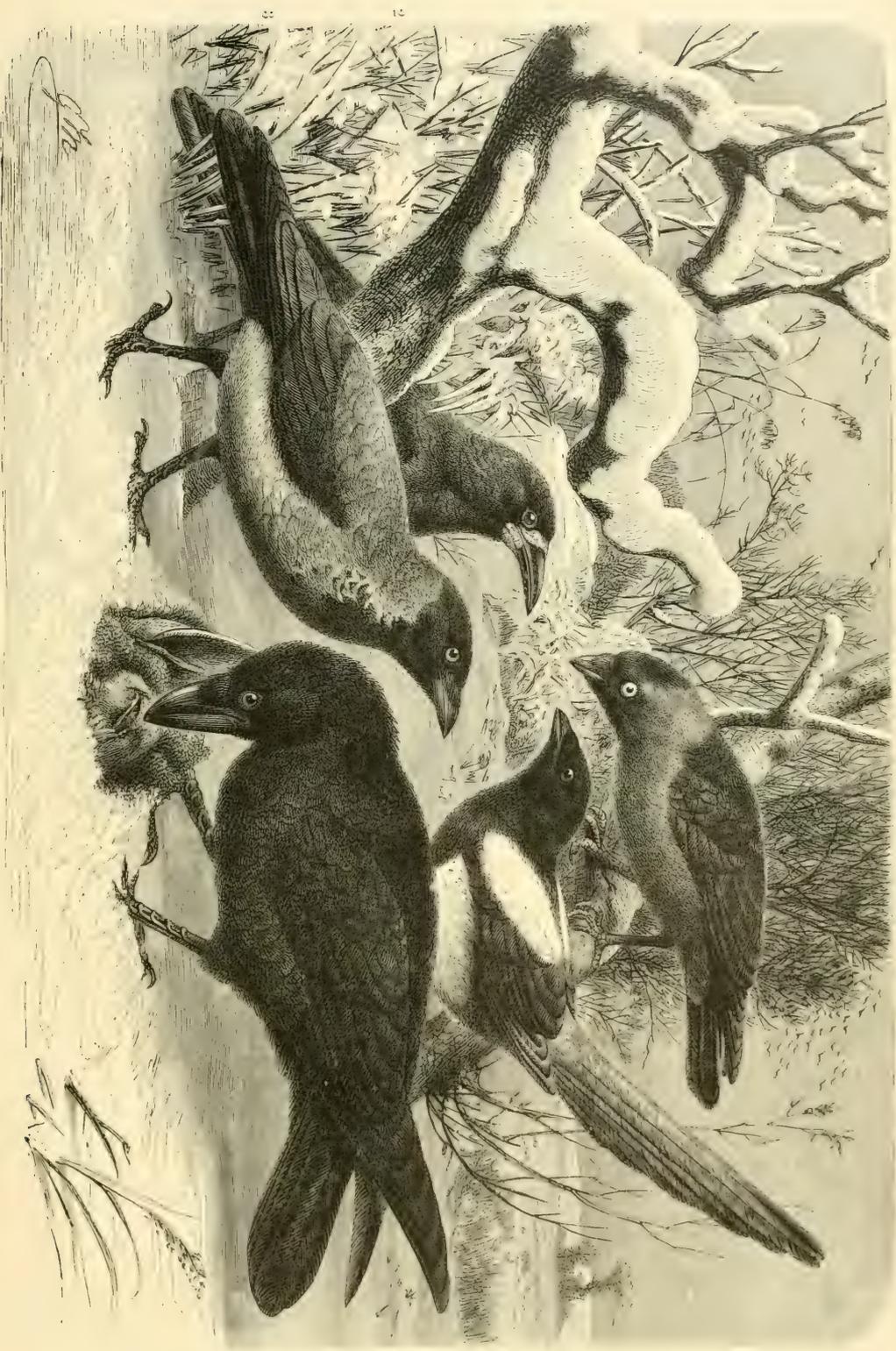
In such a large and difficult group as the perching birds it is but natural to expect diverse views among ornithologists in regard to classification. To a great extent the scheme of Dr. Sharpe is here followed, which differs very considerably from that recently proposed by Mr. Oates in the *Birds of British India*. Without attempting to weigh the value of the two, the former has been adopted, as being that more generally known. It will be obvious that in such a vast assemblage all that can be attempted in the limits of our space is to notice some of the more generally interesting types.

THE CROW TRIBE.

Family *CORVIDÆ*.

Frequently conspicuous by a black or pied plumage, often variegated with grey, and occasionally with brown, although some species, like the blue jays of South America, are much more gaudily coloured, the members of the crow family form a group which, while having few characters in common, are yet easy of recognition. Possessing a stout and generally large beak, without a distinct notch in the upper mandible, and generally straight, the crows have the chin-angle, or union of the two branches of the lower jaw, almost always produced in front of the line of the nostrils; while the tongue is non-extensile. The toes are of the normal passerine type, but although the first toe is strong, it is inferior in length to the third. The nostrils are clear of the line of the forehead, and are protected by a number of stiff bristles reaching to the middle of the beak, which are, however, shed in the adult of the European rook. The wing always has ten primary quills, and the tail twelve feathers. Mr. Oates, who includes the tits in the present family, points out that the crows may be distinguished by having the first primary quill longer than half the length of the second; while the plumage is more or less firm and glossy, and the length of the bill considerably greater than its depth. Both groups agree in that the plumage of the two sexes is alike, and undergoes but one moult (in the autumn); while the plumage of the young is paler.

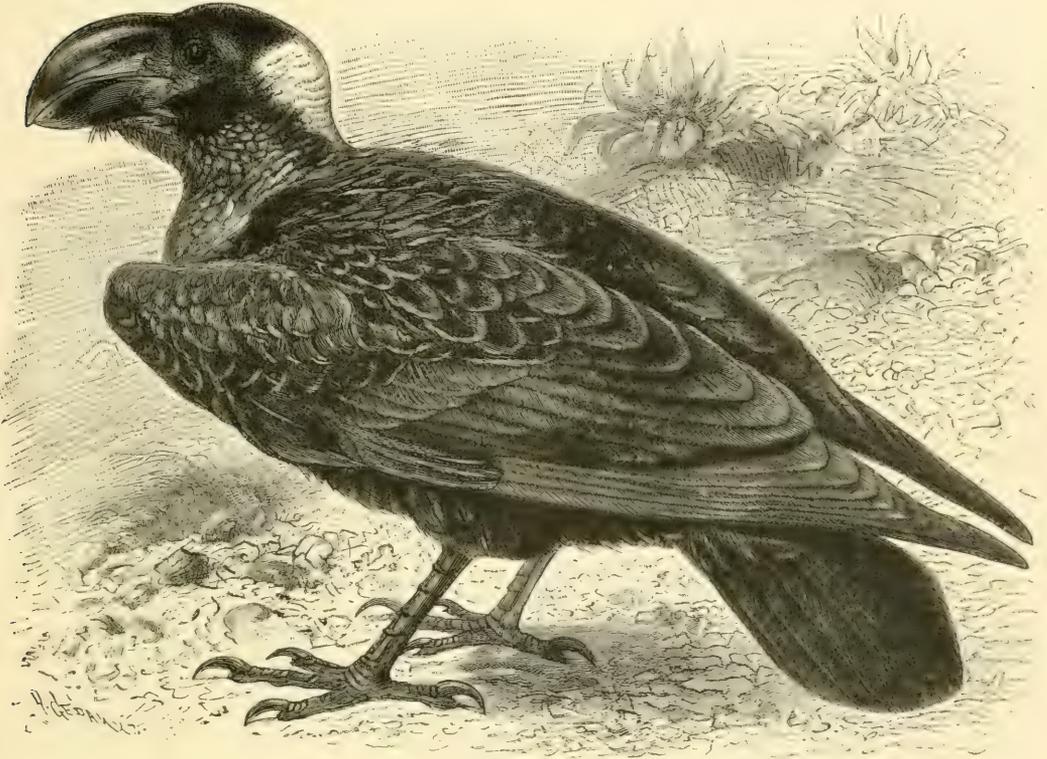
Some representatives of this specialised family are found in all the great continents; and even islands have in some cases their peculiar species. The piping



GROUP OF CROWS.

- 1, Jackdaw ; 2, Rook ; 3, Grey Crow ; 4, Magpie ; 5, Raven.

crows are only found in Australia; while magpies, nutcrackers, and choughs, are characteristic of the northern and central parts of the Old World. South America possesses some jays of brilliant plumage; those of the genus *Xanthura* having beautiful blue feathers, associated with black or deeper blue markings.

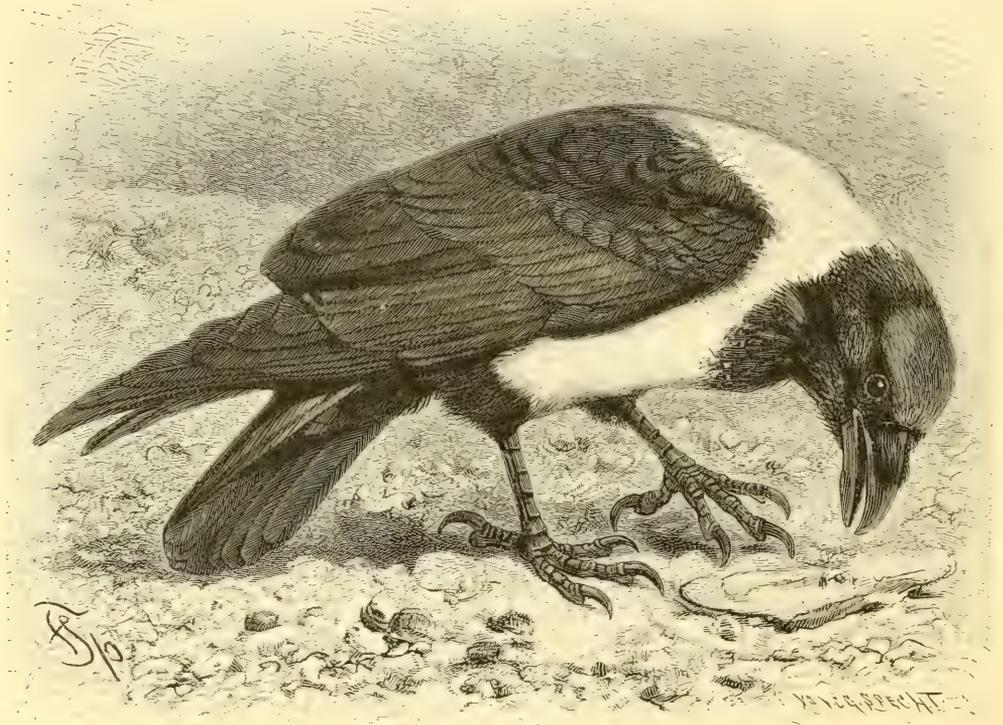


THICK-BILLED RAVEN.

Ravens and Crows. The genus *Corvus* includes all the true ravens and crows, distinguished by a stout compressed bill, straight at the base, arched towards the point, and sharp at the edges. The wings are long and graduated, and the tail is more or less graduated. The feet are powerful, the metatarsus exceeding in length the middle toe. The plumage is identical in both sexes: and black, more or less glossed with green or purple, decidedly predominates. Birds of this genus are found throughout the whole of Europe and Asia north of the line of the Himalaya, ranging into North-Western India, Australia, North America, and Mexico.

Raven. The type of this well-known genus is the large raven (*Corvus corax*), familiar to the natives of the northern parts of both hemispheres. In Japan its place is occupied by the Oriental raven, which is also found in India, Ceylon, South China, and the islands of the Malay Archipelago. The common raven of temperate Europe may be regarded as the parent form, and thrives in a wide diversity of regions, ranging from Greenland to Spain and from Portugal to Palestine, contriving constantly to adapt its habits to its immediate

environment. The raven is an early breeder, and the birds of the English fells annually repair their nests while snowdrifts are lying in deep folds on the mountain sides. It sometimes happens that a raven's nest becomes swamped by rain and driving sleet to such a degree that the eggs are chilled and rendered useless. In the event of such a contingency arising, the breeding ravens retire to some other favourite haunt, in which the female lays a fresh complement of eggs. The latter are four or five in number, rarely six; and are usually of a bluish green colour, blotched and spotted with dark olive-brown, although a reddish variety is occasionally obtained. The raven performs valuable services as a scavenger, and the damage it does the game-preserved is infinitesimally small; but it must be confessed that



WHITE-BELLIED CROW ($\frac{1}{3}$ nat. size).

shepherds have only too good reason to complain of the injuries inflicted upon ewes when dropping their lambs, for the raven readily attacks any defenceless animal such as a weak lamb or a feeble fawn.

African Crows. In Africa the genus is represented by the black African rook (*C. capensis*); the white-necked raven (*C. albicollis*), which is brown and black with a conspicuous black collar; the thick-billed raven (*C. crassirostris*); and the white-bellied crow (*C. scapulatus*). This last is a handsome bird, easily recognised by its black and white or parti-coloured plumage. It obtains much of its food about the high roads, examining the droppings of the animals that pass by, and picking the carcasses of such as perish on their journeys. It makes its nest in trees or in the recesses of rocks, and

lays about six eggs, light blue in colour, profusely spotted with brown. It sometimes nests in gardens, approaching the haunts of men; at other times it is shy and retiring, especially when breeding.

Hooded Crow. Although hybridisation is comparatively rare among the true crows, naturalists have long been aware that the hooded crow (*C. cornix*) occasionally interbreeds with the carrion crow (*C. corone*) notably in such parts of Scotland as both species frequent during the summer. It was, however, reserved for Mr. Seebohm to discover that these two species interbreed to an extraordinary extent, the hybrid offspring of the original stocks apparently proving fertile for several generations, in the valley of the Yenesei in East Siberia. This is the more remarkable because both forms possess a well-defined distribution, and only occasionally overlap one another in the breeding-season. Many naturalists (among them Professor Newton) consider that the carrion crow is only a black form or variety of the hooded crow, which has lost the dun-coloured portions of the plumage peculiar to the hooded crow of both sexes and all ages; and it must be confessed that the flight and cries of these two forms are to all intents and purposes identical. While, however, the carrion crow lives chiefly in wooded valleys, nesting in isolated pairs, and harrying the nests of other birds, the hooded crow frequents the wildest coasts of Western Europe, ranging from the northern islands that fringe the continent to the forest-regions of Central Russia, rearing its young with equal success upon the ground, in the top of a tree, or on the face of a frowning precipice. The nest of the hooded crow is often a cumbrous collection of heather-roots, sticks, and seaweed, lined with softer substances well felted together. The eggs vary from four to six in a clutch, and are greenish in ground-coloured, blotched with dark olive-brown.

Rook. The ordinary "crow" of the British public has long been known to naturalists as the rook (*C. frugilegus*), and as such is almost the best known and most familiar of European birds. The sooty plumage differs from that of its Eastern representative, the Siberian rook (*C. pastinator*), chiefly in having a bluish purple gloss in lieu of the reddish purple of the Asiatic species. The latter to a large extent retains the feathers around the bill, which are generally moulted by the western bird when arriving at maturity. Like many other crows, the rook is an early breeder, nesting sometimes in shrubs or even on the roofs of houses, but chiefly in tall trees, often in the midst of crowded streets. The young are mainly reared upon noxious insects in their various stages, on field-voles, and waste substances.



ROOK.

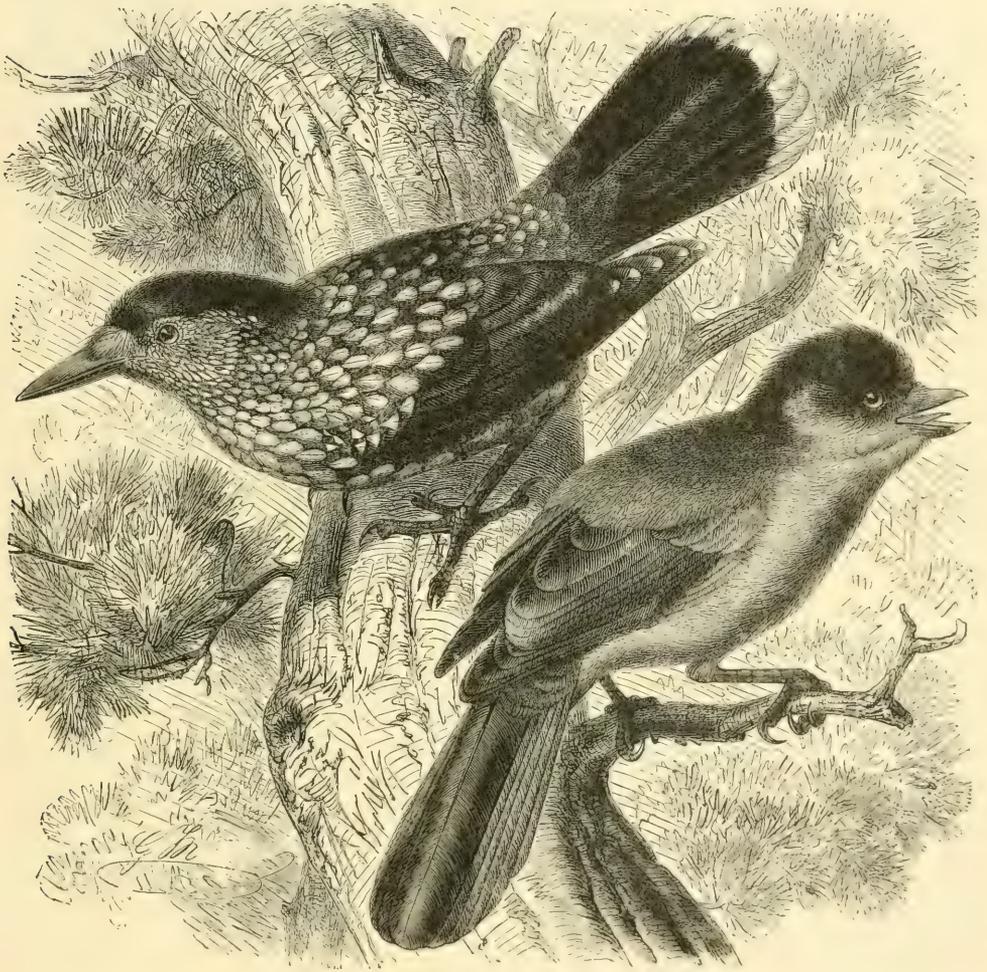
In the autumn the rooks band together to plunder cornfields. They also do much mischief to young turnips, often tearing up thousands of newly-planted seedlings; and in severe weather they attack the roots of the turnips, or devour such small birds as have become too enfeebled by want of food to elude their enemies. During the greater part of the year they are gregarious, and many of their established "rookeries" contain myriads of birds every night. Their sagacity enables them to evade the various forms of destruction which reduce the numbers of other birds, and, as they are extremely long-lived, the rapid increase in their numbers has become somewhat alarming. Though less easily reconciled to captivity than other members of the family, they are nevertheless lively and amusing pets.

Jackdaw. The daw or jackdaw (*C. monedula*) is readily distinguished from other crows by its small size, less powerful bill, and slaty-grey collar, the remainder of the plumage being entire black in the western form. The typical European daw is replaced in Northern Asia and Japan by Pallas's daw (*C. dauuricus*), which wears a broad collar of ashy white and has a white belly. The daw is distributed locally throughout temperate Europe, and is very abundant in parts of Algeria. A highly gregarious species even in the breeding-season, it forms colonies in low cliffs, nesting numerously in the holes and recesses formed by weathering. Elsewhere single pairs appropriate disused rooks' nests, adapting them to their own purposes. Not the least remarkable of the many idiosyncrasies of this familiar bird, is the readiness with which it contents itself with every variety of nesting site, rearing its young as happily in a disused rabbit-hole as in the belfry of a church. The nest is often a cumbersome pile of sticks, carefully lined with hair, wool, or other soft material. The eggs vary in number from four to six, and are bluish green spotted with grey and brown. Mr. Tait says that the jackdaws frequenting the islands on the coast of Galicia breed in holes under the stones, and follow the droves of pigs, in order to secure the insects which these animals turn up when grubbing in the soil with their snouts. While the pig ploughs up the ground, they may often be seen perching on its back, waiting their opportunity. During seasons of drought jackdaws are sometimes compelled by hunger to commit serious depredations upon the pheasant-coops, in consequence of the earthworms upon which these birds largely subsist having retired from the surface to secure moisture at a greater depth. This species does not appear to make the migratory journeys frequently accomplished by rooks and hooded crows, the daw being in fact of a somewhat sedentary character, as evinced by the attachment which it displays for favourite nesting sites. A black variety of the European jackdaw, in which the usual grey collar has become entirely suppressed, has been regarded by some naturalists as a valid species. Although these are rare, white jackdaws are sufficiently plentiful. Examples of a uniform silver-grey occur from time to time, but are less frequently met with than white or pied birds.

The Nutcrackers. The genus *Nucifraga* contains only four species, three of which are designated nutcrackers from their partiality for nuts and other fruits. The American representative of the genus is Clarke's crow (*N. columbiana*), a plain grey-coloured bird with glossy black wings, most of the secondaries broadly tipped with white, and the tail white, with the exception of the black central

feathers. This unspotted bird ranges through the coniferous woods of Western America, nesting in high pines in mountainous and northerly localities.

The nutcrackers of the Old World are birds of well-marked form and colour, not only sharing the possession of a long, straight, pointed bill with their American relative, and a black-and-white tail which is always conspicuous in flight, long wings, nostrils covered with bristly feathers, but exhibiting, in a special degree,



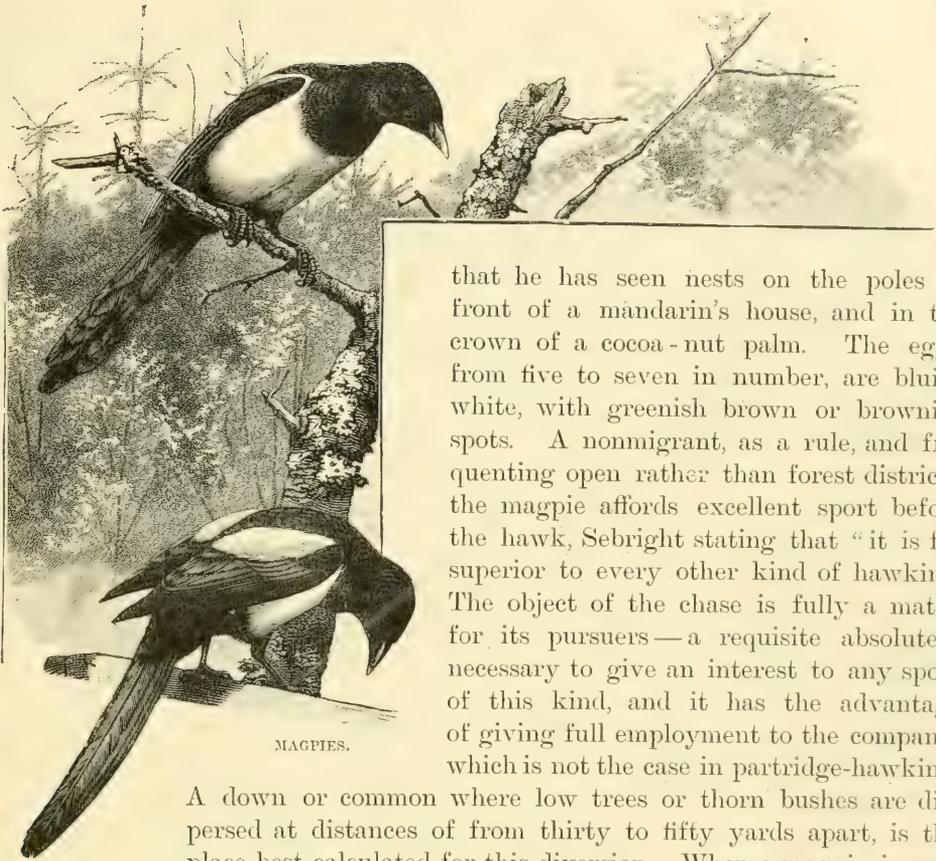
NUTCRACKER AND SIBERIAN JAY ($\frac{1}{3}$ nat. size).

a general uniformity of coloration among themselves, all three species being constantly of a general chocolate-brown, more or less spotted with white. Two of these species belong to the higher parts of the Himalaya, where they are resident throughout the year in forests of pine and cedar. The best known species is the European nutcracker (*N. caryocatactes*), which inhabits the northern and central portions of Europe and Northern Asia, ranging into Northern China and Japan. A conspicuous species during many months of the year, sometimes approaching the neighbourhood of human dwellings in search of food, in the

breeding-season the nutcracker becomes shy and cautious, so that its whereabouts is no longer easy to ascertain. The difficulty of discovering the vicinity of its nest is enhanced by the nutcracker being one of the very earliest birds to nest, and consequently the forests in which it breeds, usually vast extents of pine trees, often at an elevation of several thousand feet above sea level, are covered with deep snow at the time when the eggs have to be sought. These are usually laid in the month of March, and are pale bluish white, in ground-colour, thickly spotted with olive-brown. The young are easily reared by hand if supplied with a sufficient variety of food, and exhibit a marked predilection for insects. Mr. Howard Saunders gives the following description of the habits of the nutcracker, as observed in the Prättigäu:—"Between September 14th and 18th this species was quite common among the hazel bushes, and the top of a low wall, within five minutes' walk above the village where I was staying, was a favourite anvil on which to hammer the nuts, their shells lying thick on it. Every few minutes a bird might be seen flitting along the hillsides—its widely-spread tail-feathers displaying the white spots on their tips—with a somewhat dipping flight, less laboured than that of the jay. Often alighting on a sloping patch of sward, the nutcracker would draw itself up till its neck seemed unnaturally elongated, then give a few skips, and, taking a short flight, make a furious attack on a bush, tearing off a whole cluster of nuts. This was sometimes rejected, after a comically critical examination, and another cluster would be torn off, after which the bird would fly up to some tolerably wide branch of a fir, and hammer the nuts energetically to free them from their shucks, pausing to look up as if for admiration. Then the bird would hop rapidly up the branches—as if on the rungs of a ladder—to the top of the tree, dash away across a ravine, settle on a bush, and be lost to view for a time, returning with its crop quite distended with nuts." One of the notes is a peculiar *gur-re*, *gur-re*; but there is another, like a sprung rattle. Hancock records the fact that a nutcracker which lived in his possession for six years had a sweet, low, delicate, warbling song; this was uttered only when everything was perfectly quiet.

Magpies.

Characterised by their stout and compressed beaks, which are sharp at the edges and arched towards the tip, short and rounded wings, strong feet, and long, graduated tails, the magpies have typically a black-and-white plumage, although many of their Oriental representatives are gorgeously coloured. The common magpie (*Pica rustica*) is found throughout the more northern portions of the Old World, from Britain to Northern China, and likewise occurs in the western districts of the United States. On the other hand, the Moorish magpie (*P. mauritanica*) is peculiar to North-Western Africa, although certain Spanish specimens tend to bridge over the distinctions of colour distinguishing the typical representatives of the two forms. Familiar enough in many parts of the British Islands, magpies in the north of Europe may be seen hunting for insects on the roofs of cottages; but elsewhere they lead a wandering life, feeding on carrion, small birds, and such other animal food as they can obtain. Breeding in a variety of situations—frequently in a tall poplar, but at other times in a low bush or hedge—they construct a domed nest of dry branches, securely protected by projecting thorns. Even in China, where they nest in February, their choice of a situation of a site for building is quite as varied as in Europe, Swinhoe stating



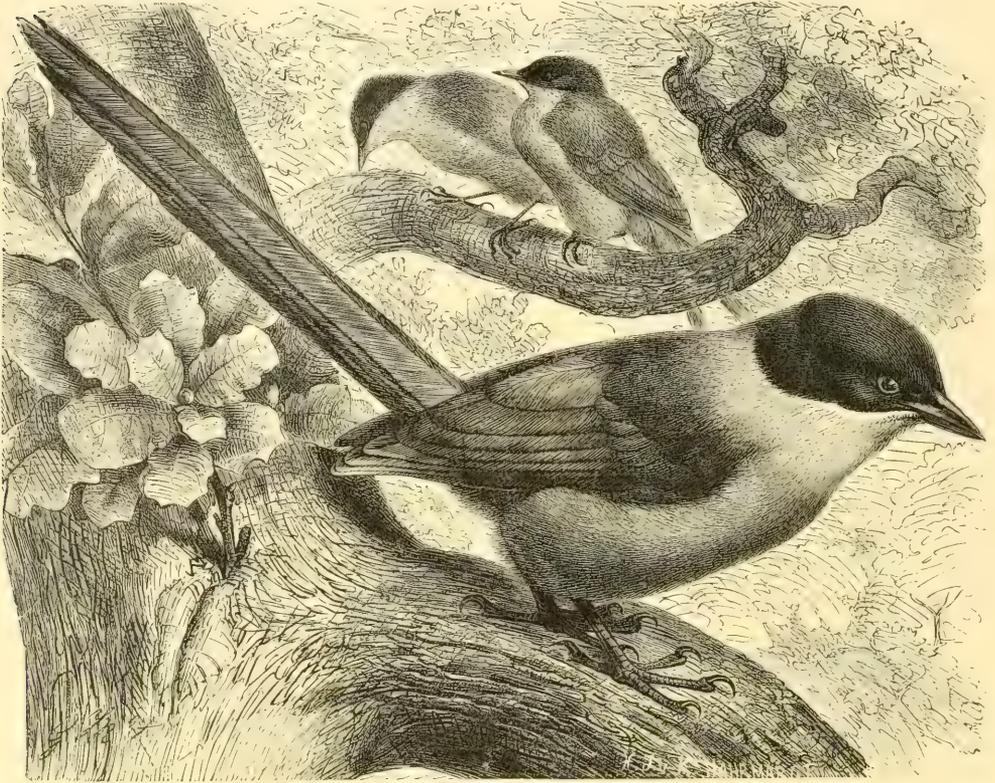
MAGPIES.

that he has seen nests on the poles in front of a mandarin's house, and in the crown of a cocoa-nut palm. The eggs, from five to seven in number, are bluish white, with greenish brown or brownish spots. A nonmigrant, as a rule, and frequenting open rather than forest districts, the magpie affords excellent sport before the hawk, Sebright stating that "it is far superior to every other kind of hawking. The object of the chase is fully a match for its pursuers—a requisite absolutely necessary to give an interest to any sport of this kind, and it has the advantage of giving full employment to the company, which is not the case in partridge-hawking.

A down or common where low trees or thorn bushes are dispersed at distances of from thirty to fifty yards apart, is the place best calculated for this diversion. When a magpie is seen at a distance, a hawk is immediately to be cast off. The magpie will take refuge in a bush the moment he sees a falcon, and will remain there until the falconer arrives, with the hawk waiting on in the air. The magpie is to be driven from his retreat, and the hawk if at a good pitch will stoop at him as he passes to another bush, from whence he has to be driven in the same way, another hawk having been previously cast off, so that one or the other may always be so situated as to attack him with advantage. Four or five assistants besides the falconer are required for this sport. The magpie will always endeavour to make his way to some strong cover; care therefore must be taken to counteract him and to drive him to that part of the ground where the bushes are farthest from each other."

Azure-Winged Magpies. The azure-winged magpie (*Cyanopica cooki*), on account of certain differences, is regarded as representing a genus apart from the typical pies; and is one of the handsomest of European birds. In colour, the head and upper-part of the neck are coal-black, the back and mantle brownish grey, the throat greyish white, the under-parts light fawn grey, and the wings and tail light greenish blue. This bird is selected for notice on account of the remarkable geographical distribution of the genus to which it belongs. Thus the typical azure-winged magpie is confined to certain districts of Spain and Portugal, where it is far from common, and very local, breeding in small colonies, and

generally resorting to districts where evergreen oaks are abundant. Unknown elsewhere in Europe, this bird is replaced in China by an almost identical form, distinguished by its superior size, and generally greyer tone of coloration, the same form also occurring in Japan. Such an instance of discontinuous



AZURE-WINGED MAGPIE ($\frac{1}{2}$ nat. size).

distribution is scarcely paralleled among the Passerines. In disposition the azure-winged pie is described as being an active and intelligent bird, building a nest very like that of the common jay.

Blue Magpies. The magpies included in the genus *Urocissa* are distinguished by having the nostrils covered with soft plumes instead of stiff bristles, and situated near the base of the bill. They further differ from the pies in having the bill either red or yellow, but never black; and they are all characterised by the predominance of azure-blue in their plumage. Unlike the true magpies, they build open nests. One species is found in Formosa, China, and Burma, and two others inhabit the Himalaya and Nipal. The Chinese blue magpie (*U. sinensis*) inhabits the hills of Eastern China, sometimes extending its range into the more wooded portions of the plains. Styan states that it is a noisy bird, and possesses a great variety of notes. It wanders about the wooded hillsides in large parties, composed exclusively of members of its own kind. The upper-parts are lavender-brown, slightly shaded with bluish purple,

the wings dull azure, brighter on the quills, the primaries being spotted with white; the tail is azure-blue, broadly tipped with white; the head and entire throat are black, all the feathers of the fore-part of the crown being tipped



RED-BILLED BLUE MAGPIE ($\frac{2}{3}$ nat. size).

with lavender-grey, and the under surface of the body being light grey. The red-billed species (*U. occipitalis*), which is the one represented in our figure, extends throughout the Himalaya, from the north-west to Nipal, where it is chiefly confined to the outer ranges. It lives in small parties containing from two or three to half a dozen birds, and breeds from March to July. The open nest is built at a variable elevation above the ground, and is formed of twigs and branches, lined with fine roots. The number of eggs ranges from three to five; their colour being similar to that characterising those of the common magpie. When feeding, these birds are generally on the ground.

The head, neck, and breast of the red-billed magpie are black; a large patch on the nape is white; back, scapulars, and

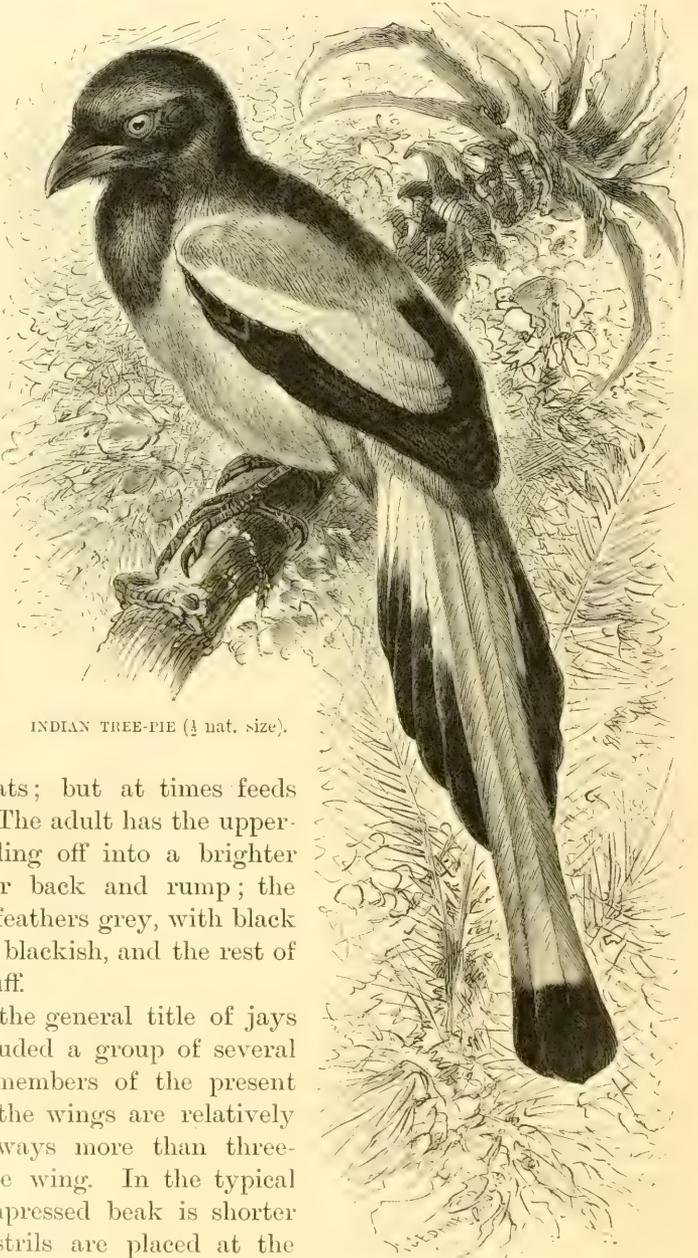
rump are purplish blue; the wings are brown; the first primaries are edged with blue; the tail is blue broadly tipped with white; the lower plumage white tinged with purple.

The genus *Dendrocitta* contains a group of Indian species, **Indian Tree-Pies.** generally resembling the pies of the Old World, but distinguished by short curved bills and the constant possession of a chestnut coloration varied with black. One species inhabits the island of Formosa: another is peculiar to the

Andaman Islands; and a third is found in the Himalaya and Assam. The most generally distributed is the common Indian magpie (*Dendrocitta rufa*), which is very common in well-wooded districts, especially in the plains; and in travelling further north is to be seen in pairs and small parties in every grove and garden, and about every village. It builds a large nest of sticks usually in some lofty tree, and lays three or four eggs of a light greenish-fawn colour, usually indistinctly blotched with brown.

It preys upon insects, small birds, and even bats; but at times feeds principally upon fruits. The adult has the upper-parts orange-brown, shading off into a brighter orange-buff on the lower back and rump; the wings are black, the tail-feathers grey, with black tips, the lores and throat blackish, and the rest of the under-parts orange-buff.

The Jays. Under the general title of jays may be included a group of several genera of closely allied members of the present family, in all of which the wings are relatively short, the tail being always more than three-fourths the length of the wing. In the typical genus the short and compressed beak is shorter than the head; the nostrils are placed at the



INDIAN TREE-PIE ($\frac{1}{2}$ nat. size).

base of the beak, and are hidden by stiff, forwardly-directed feathers; while the feathers of the crown of the head are long and erectile. The majority of the species have white upper tail-coverts, and the wings barred with light blue; the general colour of the body-plumage being fawn-red. Chiefly frequenting woods, where their presence is revealed by their harsh, discordant cries, jays are omnivorous, living on almost every description of animal and vegetable substance, but changing their diet according to the season.



COMMON JAY ($\frac{1}{2}$ nat size).

True Jays. The true jays of the genus *Garrulus* are principally inhabitants of the northern and temperate regions of the Old World, although one species is found in Burma, a second is peculiar to Algeria, and a third is confined to Japan. The common European jay (*G. glandarius*) ranges throughout Europe from Northern Russia and Scandinavia to Spain and Italy; but is replaced in Asia Minor by the black-headed jay (*G. kynicki*); while in Eastern Russia its place is taken by Brandt's jay (*G. brandti*), and in Syria by *G. syriacus*. Shunning open country, the jay frequents large woods, where it often nests at only a moderate elevation above the ground, laying usually six eggs, of a greyish white

colour speckled with brown. Although a shy bird, never dwelling in the open country and seldom seen on the ground, the jay is thoroughly arboreal in its habits; and, as its name implies, is especially fond of acorns and other forest fruits. Nevertheless, when dwelling in woods bordering gardens, it is frequently tempted forth during the fruit-season to plunder the latter. Not content, however, with the vegetable diet, the jay rifles and destroys the nests of the smaller birds, consuming both eggs and callow young alike; while it also destroys a considerable number of pheasants' eggs and chickens. In consequence of these thieving propensities, the jay is most cordially detested by the gamekeeper, who seizes every opportunity for shooting it; and in many districts of England, owing to such persecution, these handsome birds have become scarce.

The jay flies with an undulating and somewhat heavy motion, accompanied by much flapping of the wings; and generally takes only short flights from tree to tree, although when on migration it can fly for long distances. Unlike the preceding members of the family, when on the ground, the jay progresses by hopping instead of by walking. In its movements, when perching, it is lively and apparently self-conscious, the head being continually turned from side to side, the crest alternately raised and depressed, and the wings and tail in motion.

A characteristic bird of the most northern parts of the Old World is the Siberian jay (*Perisoreus infaustus*), distinguished by the possession of a soft fluffy plumage, well adapted to protect its owner from the rigour of an Arctic winter. The adult bird has the crown and nape sooty-brown, gradually fading in tinge as it joins the colour of the back; the upper-parts being dull lead-grey, washed with reddish brown, and the rump and tail bright foxy red, excepting the two central tail feathers. The chin, throat, and breast are grey, while the under-parts and flanks are bright rufous. The Siberian jay breeds early in the year, building its nest close to the stem of a pine or fir tree, and forming it principally of grey lichens closely interwoven with dry fir twigs, a few of its own feathers and those of the ptarmigan being inserted here and there, as also stalks of dry grass. The eggs vary in number from three to five, and in colour are dirty white, blotched with purplish grey and brown. Professor Newton writes: "More sprightly and cunning birds than these jays cannot well be, whether caged or not. In their own woods one hears their deep ringing *kook, kook, kook*, followed by a series of noises which sound like a conversation carried on by two or three people in an unknown tongue. One puts up a family-party off the ground where they have been feasting on the berries, and away they go through the trees with their wavering unsteady flight, every here and there a gleam of sunshine catching their tails, and turning them into gigantic redstarts. Or when one halts for any purpose, there comes a Siberian jay, at first stealthily; but soon, if he sees no sign of danger to him, he displays himself openly, perching almost within arm's length, ruffling his long, loose plumage, and calling to his neighbours."

Long-Crested Jay. A common bird in Western America, represented in Mexico by the bluer Mexican jay, is the long-crested jay (*Cyanocitta macrolopha*), which inhabits large pine forests. The upper-parts of this bird are sooty brown, passing on the rump and upper tail-coverts into beautiful, light, cobalt blue, which also occupies the lower parts. In habits it is cautious and cunning, displaying

in a marked degree the acuteness common to most members of the crow family. It nests in trees and bushes, and lays from five to six eggs, which are pale bluish green, profusely spotted with light and dark brown. The Mexican species is represented in our figure.

Urraca Jay. The urraca jay (*Cyanocorax chrysops*) is a well-known Brazilian species, found also in Paraguay and Uruguay. In colour it is black



MEXICAN LONG-CRESTED JAY ($\frac{2}{3}$ nat. size).

above, glossed with purple, the feathers of the crown forming a crest; the nape is greyish blue, deepening into purple on the hind neck; above the eye there is a blue spot; while the under surface is creamy yellow. According to Azara's account, this jay, of which we give a figure, is an abundant bird in Paraguay, where it is as familiar as is the magpie in England, not even hesitating to enter the houses of the inhabitants. Not ranging into the colder regions of Argentina, this bird seems to suffer from the cold during winter in Uruguay; and at that season it is by no means uncommon to see a party of from ten to twenty of these

jays crowding together in the most sheltered part of a tree, to obtain protection from the wind. If the tree or bush be small, and the best space limited, it may happen that some of the birds will perch on the back of their fellows, and thus form a regular pyramid. Like most gregarious pies and jays, when the flock is on the move, one bird flies off first, followed soon by another, and then by a third, till the whole party is on the wing. As a rule, the nest is built in a tall and thorny tree, and though it is strongly constructed, so coarsely made is it.



URRACA JAY ($\frac{2}{3}$ nat. size).

that the eggs can always be seen from below, and sometimes actually fall through the chinks. With a blue ground-colour, and a chalky incrustation, the eggs are generally six or seven in number, although upwards of fourteen have been taken from a single nest.

The Grey
Struthidea.

Distinguished by the arched form of the short bill, which Gould regarded as specially adapted to enable the bird to feed upon the seeds extracted from the cones of a tree found only in the district which it

inhabits, the grey struthidea (*Struthidea cinerea*) is confined to the rocky hill-ridges of Southern and Eastern Australia. The eggs are four in number, and are white in colour, blotched with reddish brown and grey; the nest is of mud, thickly lined with fine grass. The struthidea feeds principally upon insects, chiefly beetles. The two sexes are so nearly identical in size and colour that they can only be distinguished by dissection. This species differs from many other



GREY STRUTHIDEA ($\frac{1}{3}$ nat. size).

Australian birds by reason of the sober colour of its dress, which is inconspicuous and little likely to attract attention. The general colour both above and below is grey, each feather being tipped with lighter grey; while the wings are brown, and the tail is glossy black, with a greenish lustre on the outer webs of its feathers.

Piping Crows. This small genus, *Gymnorhina*, includes only three species, popularly known as Australian magpies by reason of their black and white plumage, which is common to both sexes, and never varies.

The best known member of this genus is the black-backed piping crow (*G. tibicen*), which is universally distributed over New South Wales; the white-backed piping crow (*G. leuconota*) being restricted to the southern and western parts of the Australian continent, and very abundant in Southern Australia. A third species (*G. organica*), known to the colonists as the organ-bird is peculiar to Tasmania, and will pour forth from the branch of some dead tree a succession of the strangest notes that can be imagined, much resembling the sound of a hand-organ out of tune; it is very easily tamed, and can be taught to whistle various tunes as well as to articulate words.

The black-backed species, which is the one given in our illustration, is



BLACK-BACKED PIPING CROW ($\frac{2}{3}$ nat. size).

bold and showy, enlivening and ornamenting the lawns and gardens of the colonists by its presence, and with the slightest protection from molestation becoming so tame and familiar that it approaches close to their dwellings and perches around them and the stock-yards in small families of from six to ten in number. Gould states that it prefers cleared lands, or open plains skirted by belts of timber; hence the interior of the country is more favourable to it than the neighbourhood of the coast. Its lively and intelligent habits and fine vocal powers render it a favourite cage-bird both at home and abroad. The crown, back, and under-parts are black; and the nape, wing-coverts, and upper and under tail-coverts white. Insectivorous in their habits, the piping crows live chiefly on grasshoppers, of which they consume an enormous quantity. The breeding-season commences in August and lasts till January, during which period each pair of birds nests twice.

The round and open nest is formed of twigs and leaves, with a softer lining; the three or four eggs are of a bluish white ground-colour, which may often have a reddish tinge, upon which are large blotches of brownish red or light chestnut-brown. It is noteworthy that although these birds seem always to thrive in captivity, yet their vocal powers in that state vary considerably, some specimens pouring forth the full song, while others sing only in a subdued undertone.



RED-BILLED, AND ALPINE CHOUGH ($\frac{1}{3}$ nat. size).

The Choughs. The two species of the genus *Graculus*, while resembling the true crows in form and coloration, differ in possessing long and pointed wings, as well as in the comparatively slender beak. Unlike other crows, they have a smooth metatarsus, and the feet and beak brightly coloured. Of the two species, the common or red-billed chough (*G. arvensis*)¹ ranges from Eastern Europe to China and Eastern Siberia, being no less at home in the deserts of Ladak than on the cliffs

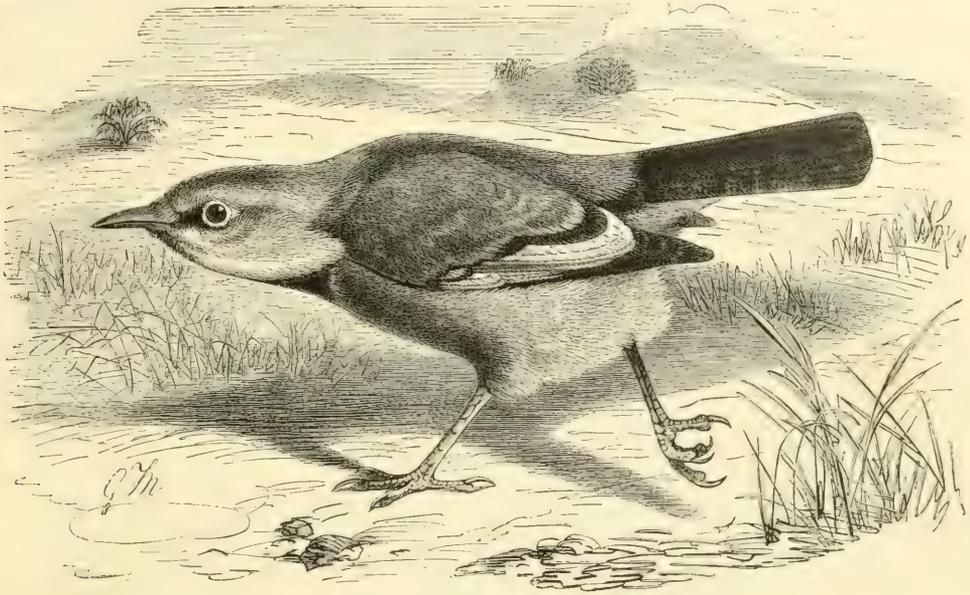
¹ When the generic name *Graculus* is adopted for these birds, the common species is generally termed *G. graculus*, but this is a combination the Editor cannot admit, and the alternative Linnean name is therefore taken.

of the English coast. Formerly this species was a comparatively common bird on the western coasts of Great Britain and Ireland, nor was it entirely a coast-loving one, since individual pairs nested in the recesses of limestone precipices inland, such as Whitbarrow Scaur in Westmoreland. The chough has, however, latterly decreased in numbers in most of its strongholds, partly owing to human interference; although there is some reason to suppose that its extermination may be partially accounted for by the special predilection of the peregrine falcon for its flesh. The chough nests in the spring of the year, breeding principally among the precipices of dizzy cliffs and headlands, deemed impregnable by all but professional cragsmen; but occasionally it rears its young among the broken pinnacles of some ruined cathedral. The eggs are white in ground-colour, streaked with brown and grey. The Isle of Man was formerly a great stronghold of the species, and when Jardine visited that island in 1827, he found the "red-legged crows" most abundant. Even in Britain the chough occasionally wanders from its maritime haunts; and in Ladak it dwells in the very heart of Asia. Not the least interesting feature in the life-history of this bird is the constancy with which individual pairs endeavour to rear their young for many successive years in the same nesting-places. Choughs obtain much of their food on the grassy borders of the cliffs which they frequent, as also in the adjacent fields, feeding either gregariously or in single pairs.

Alpine Chough. Amongst the Alps and other mountain-ranges of Central Europe the red-billed chough is in many cases replaced by the Alpine chough (*G. alpinus*) which has a yellow instead of a red beak, and is somewhat smaller in dimensions. Mr. Fowler says that the Alpine chough is the characteristic corvine of the Alps, as it also is of the Apennines; and its lively chatter, breaking suddenly on vast and silent solitudes, recalls to memory the familiar jackdaw. The Alpine chough nests amongst the crags of its native precipices; the eggs being four or five in number, and in colour white, varied with dirty yellow mottlings. This chough is a recognised article of commerce, and as such is frequently imported to Europe as a cage-bird.

Chough-Thrushes. We now come to a small but interesting group of birds, of somewhat doubtful affinity, though probably not distantly related to the choughs, from which they are at once distinguished by the relative shortness of their wings, which fall short of the tip of the tail by more than the length of the metatarsus. They are further distinguished by the possession of a peculiar style of coloration, and also by their inferior size. Comparatively little is known of the habits of the chough-thrushes, these birds being found only in certain parts of Central Asia, and having rarely come under the notice of field-naturalists. The whole of the four species known to science inhabit desert regions and sterile plains. Of these the first discovered was Pander's chough-thrush (*Podoces panderi*), and although many years have elapsed since its existence became known, it is still very rare in collections. Nor is this surprising, since its home is the lower Oxus, and the inaccessible deserts of Turkestan. It is not a gregarious species, nor does it associate with other kinds of birds, living for the most part in couples, which presumably pair for life, and constantly associate together, subsisting upon the insects and other food to be found in the vicinity of their favourite sandhills. Unlike its congener, the plain-coloured chough-thrush, the present

species is a handsome bird, and attractive in appearance; the upper-parts of the adult being clear grey; the wings white, with black at the base and at the tip; while the tail is glossy purplish black; the throat whitish; a large black patch adorns the fore-neck; and the lower-parts are vinaceous, fading into white.

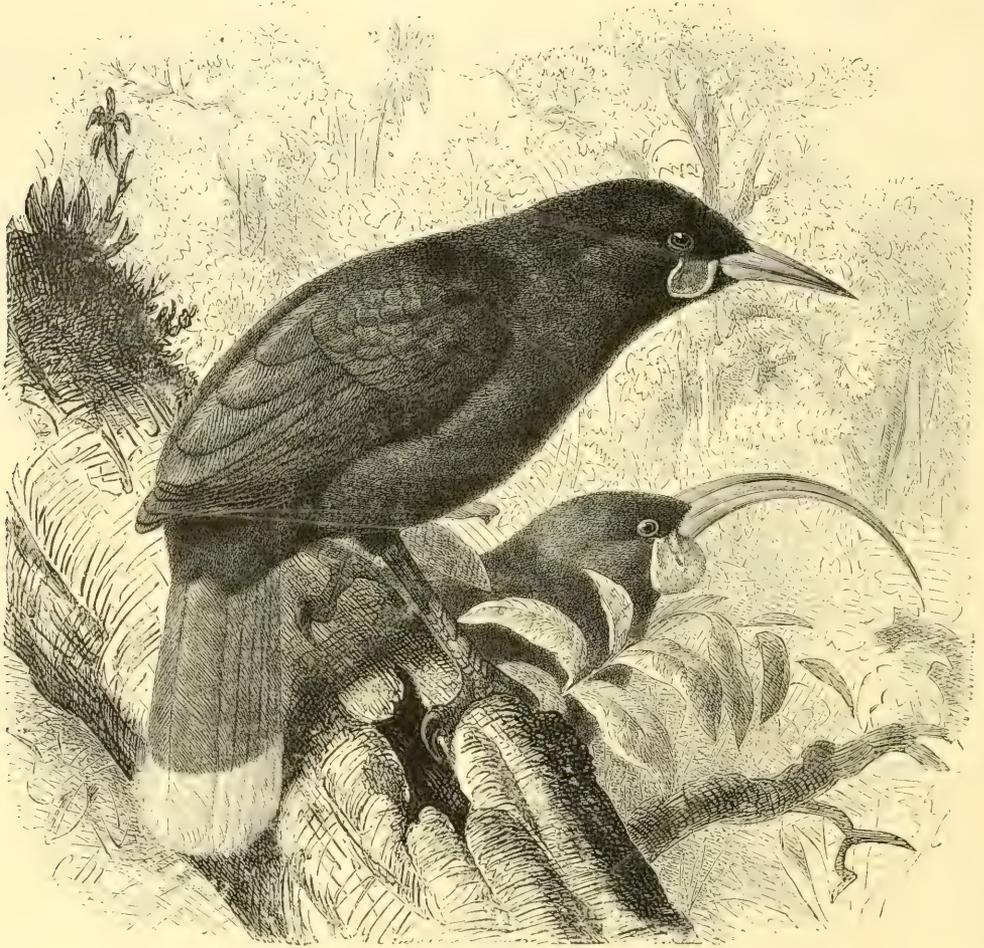


PANDER'S CHOUGH-THRUSH ($\frac{2}{3}$ nat. size).

The Huia Bird.

The genus *Heteralocha* includes a single species, variously referred to the hoopoes and crows; while Garrod considered its relations to be most intimate with the starlings, a view also adopted by Sir Walter Buller and Dr. Sharpe. The bill of the male is rather short and straight, and acutely pointed, with the sides compressed, and the nostrils at its base: while in the female it is long, curved, and slender; the difference being so great that the two sexes were at first regarded as distinct species. The wings are long and rounded. The huia bird (*H. gouldi*), which is peculiar to New Zealand, has an extremely restricted habitat, being confined to certain mountain-ranges, with their divergent spurs, and the intervening wooded valleys. The natives, who prize the bird very highly for its tail-feathers, which are used as a badge of mourning, state that, unlike other species which have of late years diminished and become more confined in their range, the huia has from time immemorial been limited in its distribution to its present haunts. Sir W. Buller, who comments on the readiness with which the huia becomes reconciled to the loss of its liberty, so long ago as 1864 received a pair of these birds from a native in exchange for a valuable stone. They were fully adult, and had been caught in the following simple manner. Attracting the birds by an imitation of their cry to the place where he lay concealed, the native, with the aid of a long rod, slipped a running knot over the head of the female and secured her. The male, emboldened by the loss of his mate, suffered himself to be easily caught in the same manner. When liberated in a large room, writes their owner, "it was amusing to notice

their treatment of the hu-hu. This grub, the larva of a large nocturnal beetle, which constitutes their principal food, infests all decayed timber, attaining at maturity the size of a man's little finger. Like all grubs of its kind, it is furnished with a horned head and horny mandibles. On offering one of these to the huia, he would seize it in the middle, and, at once transferring it to his perch, and placing one foot firmly upon it, he would tear off the hard parts, and then, throwing the grub upwards to secure it lengthwise in his bill, would swallow it whole. For the



MALE AND FEMALE HUIAS ($\frac{1}{3}$ nat. size).

first few days these birds were comparatively quiet, remaining stationary on their perch as soon as their hunger was appeased, but they afterwards became more lively and active, indulging in play with each other, and seldom remaining more than a few moments in one position. I sent to the woods for a small branched tree, and placed it in the centre of the room, the floor of which was spread with sand and gravel. It was most interesting to watch these graceful birds hopping from branch to branch, occasionally spreading their tail into a broad fan, displaying themselves in a variety of natural attitudes, and then meeting to caress each other with their

ivory bills, uttering at the same time a low affectionate twitter . . . But what interested me most of all was the manner in which the birds assisted each other in their search for food, because it appeared to explain the use, in the economy of nature, of the differently-formed bills in the two sexes. To divert the birds, I introduced a log of decayed wood infested with the hu-hu grub. They at once attacked it, carefully probing the softer parts with their bills, and then vigorously assailing them, scooping out the decayed wood till the larva or pupa was visible, when it was carefully drawn from its cell, treated in the way above described, and then swallowed. The very different development of the mandibles in the two sexes enabled them to perform separate offices. The male always attacked the more decayed portions of the wood, chiselling out his prey after the manner of some woodpeckers, while the female probed with her long pliant bill the other cells, where the hardness of the surrounding parts resisted the chisel of her mate. Sometimes I observed the male remove the decayed portion without being able to reach the grub, when the female would at once come to his aid and accomplished with her long slender bill what he had failed to do. I noticed, however, that the female always appropriated to her own use the morsels thus obtained." Buller subsequently studied the habits of the huia in the bush. The huia never leaves the shade of the forest; and moves along the ground, or from tree to tree, with remarkable celerity, by a series of bounds or jumps. In its flight it never rises like other birds above the tree-tops, except in the depths of the woods, when it happens to fly from one high tree to another. The old birds as a rule respond to the call-note in a low tremulous whistle or whimper, and almost immediately afterwards answer the summons in person, coming down noiselessly, and almost with the rapidity of an arrow."

The huia builds its nest in hollow trees, lining it with coarse grasses and bits of coarse herbaceous plants, twined into a basin-like form. A specimen of the egg brought to Buller was of a very delicate stone-grey, inclining to greyish white, without any markings except at the larger end where there are some scattered rounded spots of dark purple-grey and brown; but another specimen is described as pure white, without any trace of markings. The whole of the plumage is black, with a green metallic gloss, the tail being banded with white. Both sexes are adorned with large rounded wattles, which are of a rich orange colour in the living bird. The bill is ivory-white, darkening into blackish grey at the base. The young differ from the adults in having the entire plumage of a duller black, and the terminal bar washed with rufous. It may be added that in the superficial deposits of the North Island remains of the huia have been found in association with those of the extinct moas.

* BIRDS OF PARADISE.

Family *PARADISEIDÆ*.

In spite of their gorgeous plumage, which seems to run riot in the way of exuberance and eccentricity, the birds of paradise, according to the system we are

* NOTE. See p. 374.

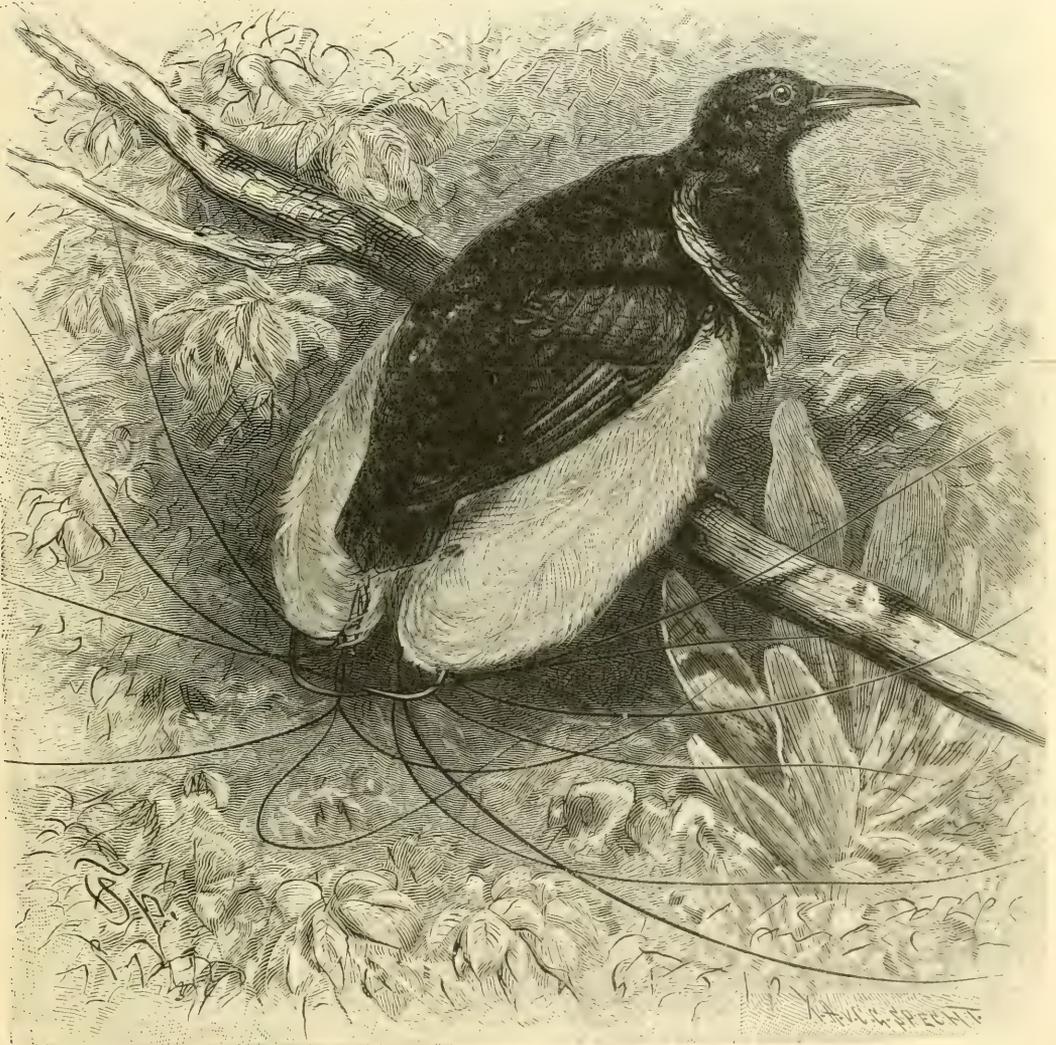
following, are regarded as near allies of the crows, from which they may be distinguished by the abnormal structure of the toes. Thus, the outermost or fourth toe is inferior in length to the third, which is longer than the second; while the first is very large, and equal to or longer than the third. According to Dr. Sharpe's arrangement, the birds of paradise may be divided into two groups, in the first of which the beak is short and more or less stout, with its culmen shorter than the metatarsus; while in the second it is long and slender, the culmen being longer than the metatarsus.

These birds, which are represented by nearly fifty species, are almost wholly confined to New Guinea and the adjacent Papuan Islands (especially the Aru group), although one genus is found in the Malaccas, while three genera extend to North Australia. Although the females are at best generally plain and ordinary-looking birds, often of a uniform chocolate-colour, the adult males of all the species are characterised by an extraordinary development of plumage, quite unparalleled in any other group. "In several species," writes Mr. Wallace, "large tufts of delicate bright-coloured feathers spring from each side of the body beneath the wings, forming trains, or fans, or shields; and the middle feathers of the tail are often elongated into wires, twisted into fantastic shapes, or adorned with the most brilliant metallic tints. In another set of species these accessory plumes spring from the head, the back, or the shoulders; while the intensity of colour and of metallic lustre displayed by their plumage is not to be equalled by any other birds, except, perhaps, the humming-birds, and is not surpassed even by these."

Although but very little is known in regard to the habits of these lovely birds, it appears that as regards food they are generally omnivorous, feeding on fruits and insects, and showing a marked preference for figs, grasshoppers, locusts, leaf-insects, and caterpillars. Even, however, when supplied with food of this nature in captivity they almost immediately pine and die. While the long-tailed species are purely arboreal, some of the short-tailed kinds, like the six-plumed bird of paradise, are frequently seen on the ground; and in all cases the cock-birds are fond of assembling for mutual display. Till recently their eggs have been almost unknown, but such as have been obtained recall those of some of the rails in appearance. They are two in number, and laid in a nest built high up in the tree-tops. The eggs of the Empress Augusta paradise-bird have a pale pinkish buff ground-colour, upon which are streaks and spots of reddish brown and grey. Several of the species have a very small distributional area, but in no case is the range more restricted than in the red bird of paradise, which is entirely confined to the small island of Waigiou, at the north-western extremity of New Guinea, in which spot it replaces the members of the genus to which it belongs found in the other islands.

Twelve-Wired Bird of Paradise. Commencing with the second of the two groups referred to above, or the one in which the beak is relatively long and slender, we may take as a first example the beautiful twelve-wired bird of paradise (*Seleucidés nigricans*), which is the sole representative of this genus. Having a short, squared tail, much inferior in length to the body, this genus is distinguished by the absence of a jugular shield of metallic plumes on the throat and fore-neck; and still more so by the feathers of the flanks, which are

yellowish like those of the breast, being produced and their shafts elongated into six pairs of bare wire-like bristles, which are bent forwards in a bold curve. As regards the plumage, the head is covered with short velvety feathers of a purplish bronze colour; the breast appears at first nearly black, but in different lights shows various metallic tints, especially green and purple, the



TWELVE-WIRED BIRD OF PARADISE ($\frac{1}{3}$ nat. size).

outer edges of the feathers being margined with emerald-green. The whole of the back and shoulders is rich bronzy green, while the closed wings and tail are of the most brilliant violet-purple: and the whole plumage has a delicate silky gloss. Posteriorly to the fore-breast, the whole of the under-parts are of a rich buffy yellow, the same tint characterising the plumes of flank-feathers, which extend about an inch and a half beyond the tail. The total length of the bird is about a foot, of which two inches are taken up by the compressed beak. The

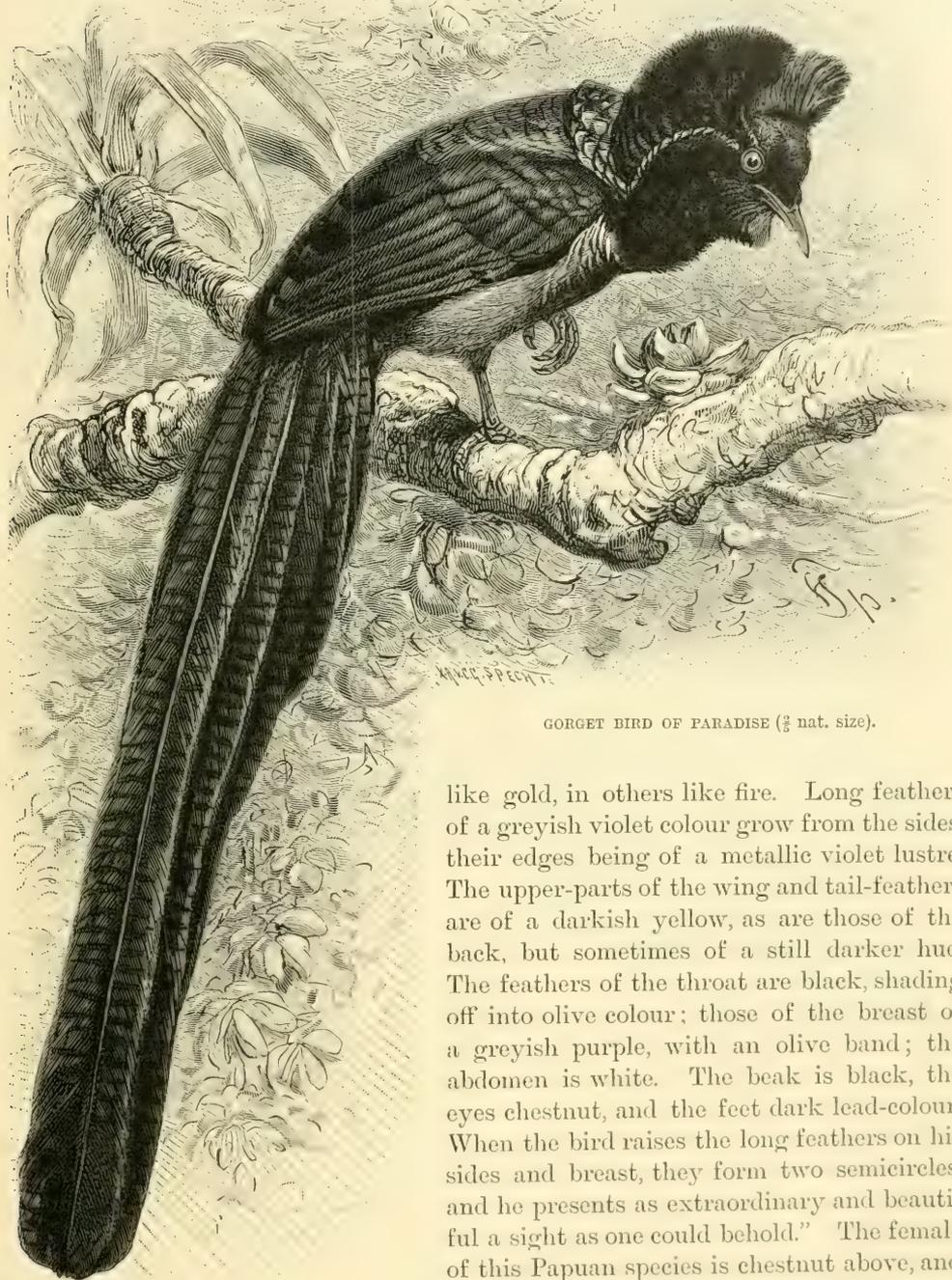
female, although less sombre than in some of the group, has none of the bright plumes of her partner, being bright chestnut-red above, with the crown of the head and back of the neck brown, while the under-parts are buffy brown, irregularly barred with blackish brown.

Inhabiting the island of Salwatti and the north-western parts of New Guinea, the twelve-wired bird of paradise, according to Mr. Wallace, "frequents flowering trees, especially sago-palms and pandani, sucking the flowers, round and beneath which its unusually large and powerful feet enable it to cling. Its motions are very rapid. It seldom rests more than a few moments on one tree, after which it flies off, and with great swiftness, to another. It has a loud, shrill cry, to be heard a long way off, consisting of *cah, cah*, repeated five or six times in a descending scale, and at the last note it generally flies away. The males are quite solitary in their habits, although, perhaps, they assemble at certain times like the true paradise-birds." Both Mr. Wallace and Dr. Guillemard have been fortunate enough to see this splendid bird in the living state. To capture them, the natives search the forest until they discover a roosting-place, where the hunter conceals himself beneath the tree, and having marked the particular bough on which the bird is accustomed to perch, ascends the stem at night, and secures his prize by the simple expedient of stealthily putting a cloth over it.

There are three other genera included in the long-beaked group, **Allied Genera.** or *Epimachina*, namely, *Ptilorhis*, *Epimachus*, and *Drepanornis*. The first of these three are inhabitants of Northern Australia and New Guinea, and are commonly known as rifle-birds. While agreeing with the twelve-wired paradise-bird in the relative proportions of the tail, they differ in having a jugular shield of metallic plumes occupying the throat and fore-neck, as well as by the absence of the "wires." The scale-breasted bird of paradise (*P. magnifica*) is the Papuan representative of this genus, and is characterised by the shield of stiff metallic green feathers on the breast, and a small tuft of somewhat hairy plumes on the sides of the same; the back and wings being velvety black, faintly glossed with purple. The long-tailed bird of paradise (*Epimachus speciosus*), together with an allied Papuan species, represent the second of the three genera, sufficiently distinguished by the great elongation of the graduated tail, which is much longer than the body. Resembling the twelve-wired species in its dark velvety plumage, glossed with purple and bronze, this bird has the tail, which exceeds two feet in length, tinted above with a splendid opalescent blue; but its chief ornament is the group of broad feathers arising in a fan-like manner from the sides of the breast, which are dilated at their extremities, and banded with vivid blue and green; the beak being long and curved, and the feet black. In total length this bird measures between 3 and 4 feet. It is an inhabitant of the mountains of New Guinea, sometimes found near the coast.

The fourth genus is represented by the Albertis bird of paradise (*Drepanornis albertisi*), which differs from all the others in having a long, slender, sickle-shaped beak, downy plumage, a moderately long graduated tail, and the flank-feathers developed into a brown fan-like shield. "Above the beak," writes its discoverer, Signor Albertis, "are two tufts or horns, formed of small feathers deeply marked with green and copper-coloured reflections. The long feathers which grow from

the sides of the breast are, when closed, grey, shot with a violet tint; but when spread they form almost a semicircle round the body, and in certain lights shine



GORGET BIRD OF PARADISE ($\frac{2}{3}$ nat. size).

like gold, in others like fire. Long feathers of a greyish violet colour grow from the sides, their edges being of a metallic violet lustre. The upper-parts of the wing and tail-feathers are of a darkish yellow, as are those of the back, but sometimes of a still darker hue. The feathers of the throat are black, shading off into olive colour; those of the breast of a greyish purple, with an olive band; the abdomen is white. The beak is black, the eyes chestnut, and the feet dark lead-colour. When the bird raises the long feathers on his sides and breast, they form two semicircles, and he presents as extraordinary and beautiful a sight as one could behold." The female of this Papuan species is chestnut above, and yellower beneath.

**The Gorget Bird
of Paradise.**

This species (*Astrapia nigra*), from the mountains of Central New Guinea, is the sole representative of its genus, and brings us to the short-beaked or typical group of the family. Having a long and graduated tail, of which the central plumes are not elongated into wire-like shafts, it is especially distinguished by the thick feathering of the lores and angle of the mouth, by the presence of an erect frill surrounding the head, and another frill of a golden coppery tint round the throat. In the adult male the general colour of the upper-parts is velvety black, with a purplish gloss; the two long central tail-feathers are glossed with purple; the frill round the head is golden-green; while the feathers of the throat are steely black, with the above-mentioned gorget of brilliant copper; a ruff of black plumes springs from the shield on the neck; the flanks are dusky black, and the under-parts velvety grass-green.

**Wattled Bird
of Paradise.**

An allied genus is represented by the wattled paradise-bird (*Paradigalla carunculata*) of New Guinea, distinguished by the lores having an erect orange-yellow wattle, while another of azure blue hangs from each angle of the mouth; the tail being shorter than the body, and the head and throat devoid of frills.

**Typical Birds of
Paradise.**

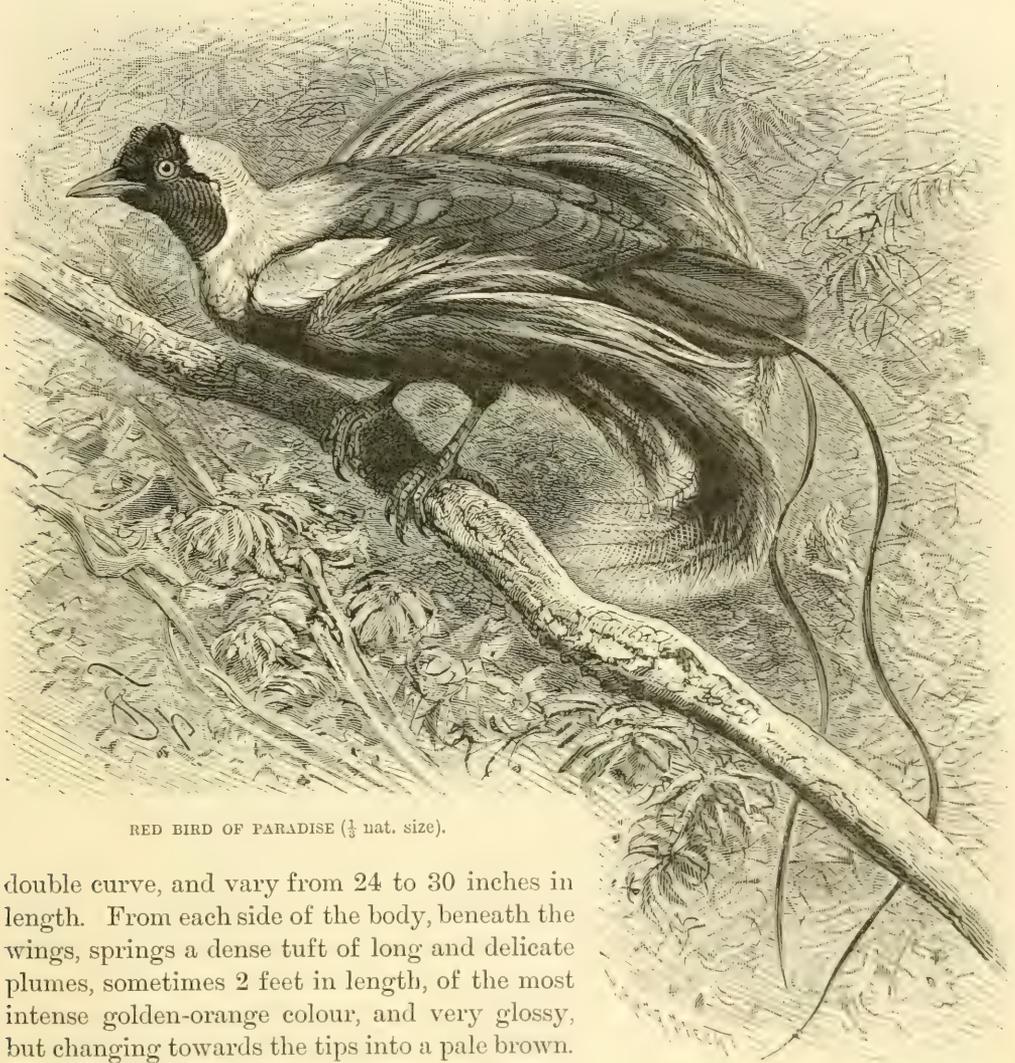
The great bird of paradise (*Paradisea apoda*), which was the first known representative of the entire family, derives its specific name from having been described by Linnæus from a skin prepared in the Papuan fashion, with the wings and feet cut off. The genus, which is represented by several species from Papua and the Aru and other islands, is characterised by the production of the central pair of tail-feathers into extremely long, horny, wire-like shafts, the absence of a shield on the back, and the elongation of the flank-plumes into two huge bunches of feathers reaching far beyond the tail. The great bird of paradise, of the Aru Islands, is the largest



GREAT BIRD OF PARADISE.

representative of the genus, measuring from 15 to 18 inches in total length, and is described by Mr. Wallace, as follows:—"The body, wings, and tail are of a rich coffee-brown, which deepens on the breast to a blackish violet or purple-brown. The whole of the top of the head and neck is of an exceedingly delicate straw-yellow, the feathers being short and close set, so as to resemble plush or velvet; the lower part of the throat up to the eye is clothed with scaly feathers of an

emerald-green colour, and with a rich metallic gloss, and velvety plumes of a still deeper green extend in a broad band across the forehead and chin as far as the eye, which is bright yellow. The beak is pale lead-blue; and the feet, which are rather large, and very strongly and well-formed, are of a pale ashy pink. The two middle feathers of the tail have no webs, except a very small one at the base and at the extreme tip, forming wire-like cirrhi, which spread out in an elegant



RED BIRD OF PARADISE ($\frac{1}{3}$ nat. size).

double curve, and vary from 24 to 30 inches in length. From each side of the body, beneath the wings, springs a dense tuft of long and delicate plumes, sometimes 2 feet in length, of the most intense golden-orange colour, and very glossy, but changing towards the tips into a pale brown. This tuft of plumes can be elevated and spread out at pleasure, so as almost to conceal the body of the bird." In the female the whole of the ornamental plumes are wanting, and the colour is a uniform coffee-brown. The lesser bird of paradise (*P. minor*), from New Guinea, and several of the adjacent islands, although considerably smaller, is very similar in general characteristics.

Red Bird of
Paradise.

On the other hand, the red bird of paradise (*P. sanguinea*), from the islands of Waigiou, Ghemien, and Batanta, is a very distinct

form. Measuring from 13 to 14 inches in length, it has the flank-plumes shorter, and of a rich crimson hue, while in structure they are rigid, their tips being horny, and nearly white. The forehead, sides of the head, and the whole throat are a brilliant metallic green, with the plumes of a velvety texture; the sides of the neck and entire mantle are bright golden-yellow, deepening into orange on the sides of the mantle and the middle of the back; the rump is straw-yellow, the two central feathers consisting of two long shafts, 21 inches in length, of a metallic horny structure; the wing-coverts are golden yellow; the primaries ruddy chestnut; and breast deep purplish chestnut. The female and young have the sides of the head and forehead purplish brown; the hind-part of the head, neck, and mantle straw-yellow, deepening into orange; the remainder of the upper surface, including the wings and tail, being chestnut-brown, as are the lower-parts.

Habits.

Thoroughly arboreal in their habits, the birds of this genus live both upon insects and fruits; and occasionally they may be seen running along the lower boughs of trees almost like woodpeckers, with the long, black filaments of the tail hanging gracefully down on each side. In motion throughout the day, they are active and vigorous; and while small flocks of females and immature males are constantly met with, the adult cocks are less commonly seen, although their presence near by is revealed by their loud and harsh cries. At certain seasons of the year the adult males flock together in a selected tree for the purpose of display, forming what the natives term dancing-parties. "On one of these trees," says Mr. Wallace, "a dozen or twenty full-plumaged male birds assemble together, raise up their wings, stretch out their necks, and elevate their exquisite plumes, keeping them in a continual vibration. Between whiles they fly across from branch to branch in a state of great excitement, so that the whole tree is filled with waving plumes in every variety of attitude and motion." When thus assembled, the birds are shot with blunt-headed arrows by the natives, who climb silently into the "play-tree," and seat themselves in some convenient fork. From continual persecution to supply the European market with skins, the great bird of paradise, according to Dr. Guillemard, has of late years greatly diminished in numbers.

King Paradise

Bird.

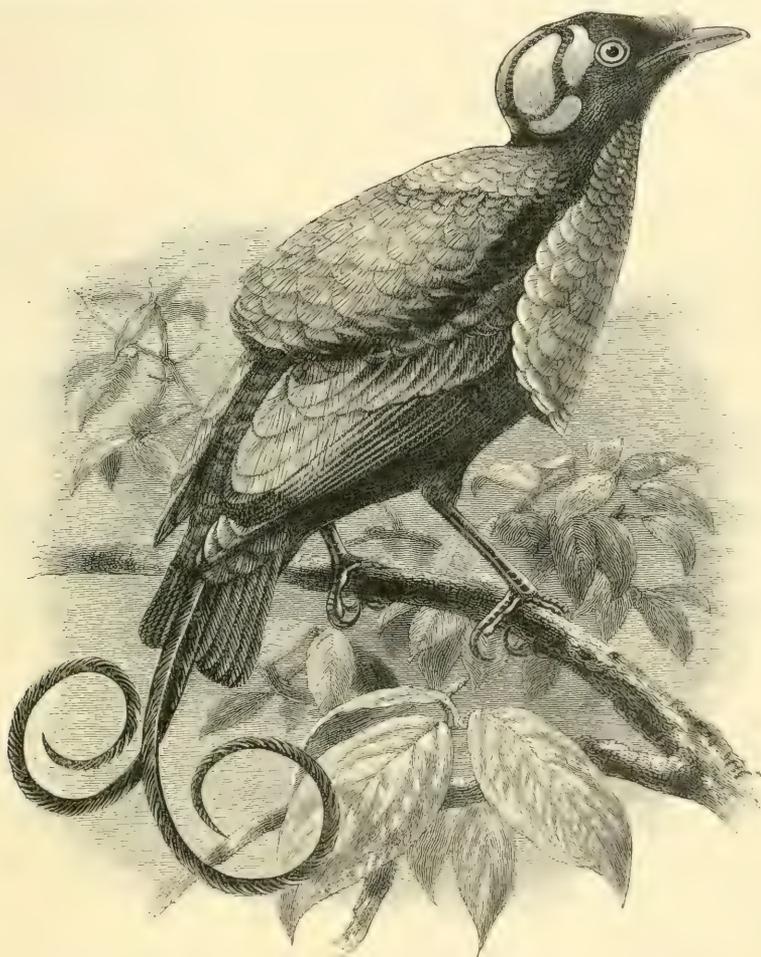
The beautiful little king bird of paradise (*Cicnipurus regius*), from New Guinea and the adjacent islands, forms the type of a distinct genus, distinguished by the flank-plumes not extending beyond the tail, by the presence of a large tuft of fan-like plumes on each side of the breast, and by the two central tail-feathers being long and racket-like. Measuring only about 6½ inches in length, this lovely species has the head, throat, upper-parts, wings, and tail red, the fan-like plumes on the sides purplish, tipped with green, a green gorget below the red of the throat, and the rest of the under-parts white.

Wilson's Bird

of Paradise.

The remarkable species (*Diphyllodes wilsoni*) we illustrate may be included in a Papuan genus, typically represented by the magnificent paradise-bird (*D. magnifica*), and distinguished from the preceding by the presence of a shield of feathers on the back, and the absence of elongated flank-plumes; while from an allied genus (*Rhipidornis*) it differs in having no fan-shaped shield of feathers springing from each side of the breast. Whereas, however, in the magnificent paradise-bird the head is thickly feathered, in the species under consideration, with the exception of a few narrow tracts of feathers, it is bare; on

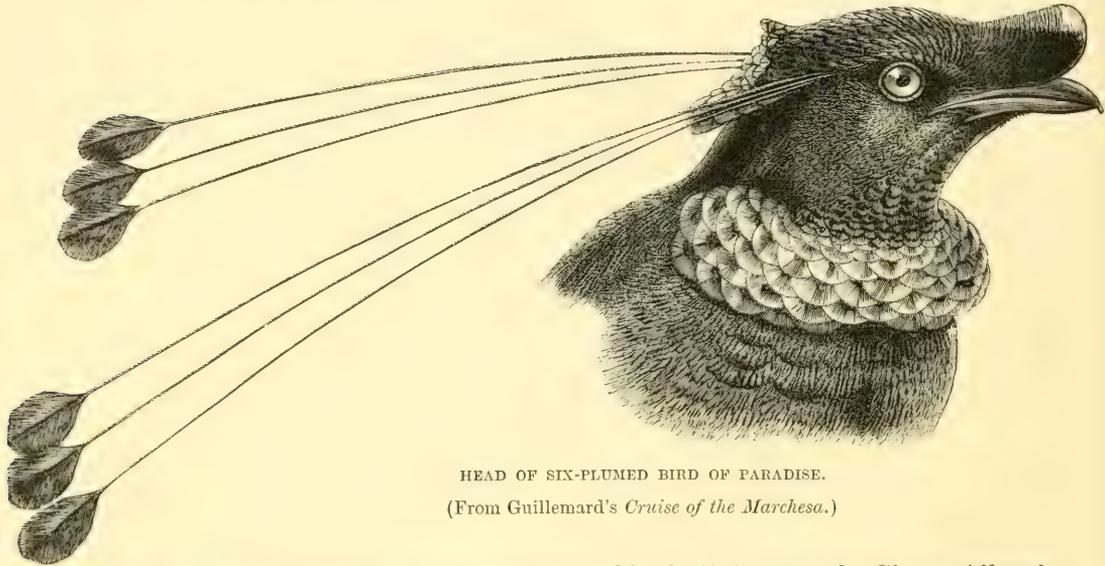
which account some writers refer Wilson's bird of paradise to a distinct genus. Describing this remarkable species, Dr. Guillemard writes that "behind the head a ruff of canary-coloured feathers stands erect above the scarlet back and wings. The breast is covered by a shield of glossy green plumes, which towards the throat are marked with metallic green and violet spots of extraordinary beauty. The two central feathers of the tail, prolonged for 5 or 6 inches beyond the others, cross



WILSON'S BIRD OF PARADISE. (From Guillemard's *Cruise of the Marchesa*.)

one another, and are curved into a complete circle of bright steely purple. But the chief peculiarity of the bird is the head, which is bald from the vertex backwards, the bare skin being of the brightest imaginable blue. The bizarre effect thus produced is still further heightened by two fine lines of feathers, which running lengthways and from side to side form a dark cross upon the brilliant azure background." This bird is of small size, and is confined to Waigiou and Batanta Islands, where it appears to be very locally distributed, frequenting forests of no great height, at an elevation of some eight hundred feet above the sea.

Six-Plumed Bird of Paradise. Another strange and beautiful representative of a group in which all are lovely beyond description is the six-plumed bird of paradise (*Parotia seppennis*) of New Guinea, which is the only known member of its genus. In common with the remaining members of the family, this bird has a short tail, without any elongation of the central pair of feathers, while it is specially characterised by three pairs of very long racket-feathers springing from the sides of the head. With the exception of a vivid steely-green bar across the crown of the head, and a tuft of silvery feathers at the base of the beak, together with a green and bronze gorget on the breast, the plumage is almost entirely black; the tuft of silvery feathers on the beak being capable of erection or depression at will. For many years this splendid species was known only by skins badly prepared by the



HEAD OF SIX-PLUMED BIRD OF PARADISE.
(From Guillemard's *Cruise of the Marchesa*.)

natives; but eventually it was observed in the living state by Signor Albertis, who writes as follows of his first sight of it in its native haunts:—"After standing still for some moments in the middle of the little glade, the beautiful bird peered about to see if all was safe, and then he began to move the long feathers of his head, six in number, from which his name is derived, and to raise and lower a small tuft of white feathers above his beak, which shone in the rays of the sun like burnished silver; he also raised and lowered the crest of stiff feathers, almost like scales, and glittering like bits of bright metal with which his neck was adorned. He spread and contracted the long feathers on his sides in a way that made him appear now larger and again smaller than his real size, and, jumping first on one side and then on the other, he placed himself proudly in an attitude of combat, as though he imagined himself fighting with some invisible foe. All this time he was uttering a curious note, as though calling on some one to admire his beauty, or perhaps challenging an enemy." From this account it would appear that the species is much less arboreal in its habits than the other members of the family.

The Standard-Wing. Even more remarkable than the last is the standard-wing (*Semioptera wallacei*), from the islands of Batchian and Gilolo, which like-

wise forms a genus by itself, and is characterised by the absence of long thread-like plumes on the head, and the presence of two long projecting feathers from each wing, which are capable of being erected at the pleasure of their owner. Its discoverer, Mr. Wallace, describes this bird as being generally of a delicate olive-brown colour, deepening to a kind of bronzy olive in the middle of the back, and changing to a delicate ashy violet with metallic reflections on the crown of the head; the feathers covering the nostrils and extending half-way down the beak being loose and upwardly curved. On the breast the scale-like feathers are margined with a rich metallic bluish green; while the same colour embraces the throat and sides of the neck, together with the long pointed plumes arising from the sides of the breast. The two long projecting white feathers springing from near the bend of the wings are fully 6 inches in length, and are spread out, whenever the bird is excited, at right angles to the wings. The beak is horny olive, the iris deep olive, and the foot bright orange. In total length the bird measures 11 inches. The standard-wing, which resembles the rest of its tribe in being in constant motion, frequents the lower boughs of the forest trees, "flying from branch to branch, clinging to the twigs, and even to the smooth and vertical trunks almost as easily as a woodpecker. It continually utters a harsh, croaking note, somewhat intermediate between that of a *Paradisæa apoda* and *Cicinnurus regius*. The males at short intervals open and flutter their wings, erect the long shoulder-feathers, and spread out the elegant green breast-shields." It is noteworthy that the examples of this species from Gilolo differ somewhat in coloration and the conformation of the plumes from those inhabiting Batchian, so that an expert is at once able to say from which of the two islands any given specimen was obtained.

Superb Bird of Paradise. The acme of strange plumed adornment (which in all these cases is in all probability developed to attract the admiration and attention of the female, since it can have no other conceivable object) seems to be attained by the superb bird of paradise (*Lophorhina superba*), which is chiefly characterised by the presence of an enormous erectile forked shield of velvety black feathers, arising from the nape of the neck, and when in repose lying flatly on the back. So strange and apparently incongruous is this shield that it might suggest to the beholder that the tail of some other bird had been stuck on to the skin, were it not that its feathers are of a different type. The ground-colour of the plumage is of the deepest black, but with bronze reflections on the neck, while the feathers of the head are metallic green and blue. Spreading over the breast is a shield composed of narrow and rather stiff feathers, which extends in a pointed form along each side, and is emarginate in the middle. In colour this is bluish green, with a satiny sheen: the back-shield, on the other hand, is velvety black, with reflections of bronze and purple, its outermost feathers exceeding the primaries of the wing in length. So far as Dr. Guillemard could gather from native reports, it would seem that the enormous crest, as it appears displayed during the courtship of the female, is not only raised, but spread widely out in a fan-like manner, while the chest-shield is similarly expanded. Hence the head of the bird forms the centre of an irregular circle of feathers of velvety black and emerald, completely concealing the rest of the body when viewed from the front.

The remaining genera of the family, such as *Phonygama* of New Guinea and

North Australia, *Manucodia* of North Australia and the adjacent Papuan Islands, and *Lycocorax* of the Moluccan and Papuan Islands, must here be passed without further mention.

* THE BOWER-BIRDS.

Family *PTILONORHYNCHIDÆ*.

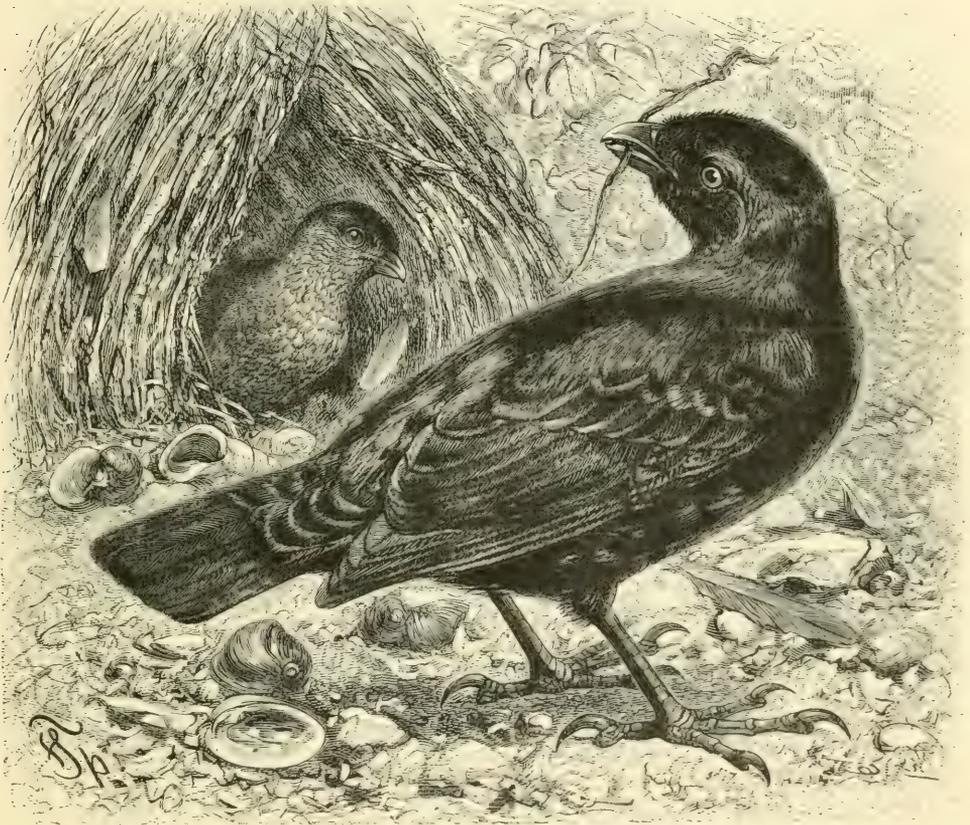
By no means easy of definition, the bower-birds, most of which are, however, characterised by building the structures from which they take their name, have given rise to some difference of opinion among ornithologists as to their affinities, and they have been included in the preceding family, although they are now placed by Dr. Sharpe in his catalogue of the birds in the Museum of the Royal College of Surgeons between the birds of paradise and the starlings. While the so-called regent-bird approximates to the former group in the nature of the feathers on the head, and the gorgeous coloration of its plumage, the true bower-birds are more thrush-like in appearance. The group is mainly peculiar to Australia, although one Australian genus extends to the Papuan Islands, and another genus (*Amblyornis*), with a single species, inhabits New Guinea only.

They all have the base of the beak fully feathered, and the foot of the normal Passerine type. In the position of the flexure of the lower mandible, immediately below the aperture of the nostrils, the skull resembles that of the birds of paradise; but, in a slight backward projection of the hinder extremity of the mandible, they approximate to the starlings, in which it is more developed, while the flexure is further back.

The satin bower-bird (*Ptilonorhynchus holosericeus*) is the type of a genus characterised by the short, convex, and laterally compressed beak, in which the nostrils are basal and concealed by the silky feathers of the forehead; the wings being pointed, the tail somewhat rounded, and the feet stout and furnished with moderately long claws. These bower-birds belong to the eastern and northern districts of Australia.

The localities frequented by the satin bower-birds are the luxuriant and thickly foliated brushes stretching along the coast of New South Wales. Their popular name owes its origin to their extraordinary habit of constructing what the colonists commonly call "runs," which are used by the birds as a playing-house, and are constructed in avenue form, built of pieces of stick or grass and adorned with stones, bright-coloured shells, and even bleached bones, as well as the blue tail-feathers of certain parrakeets. The natives are so well acquainted with the propensity of these birds for carrying off any attractive object, that they always search the runs for any small article that may have been dropped in the bush; and in one Gould found a small neatly-worked stone tomahawk, together with some slips of blue cotton rags, which the birds had doubtless picked up at a deserted encampment of the natives. This is a stationary species, but roams from one part of the district to another in search of food. It appears to have particular times in the day for feeding, and when thus engaged may be approached within a few feet, although at other times the old males are shy and watchful. In autumn these bower-birds associate in

small flocks, and may often be seen on the ground near the sides of the rivers. The adult male is entirely of a deep, shining blue-black, closely resembling satin, with the exception of the wings and tail, which are of a deep velvety black. The female has all the upper-parts greyish green; the under surface being similar, but lighter and washed with yellow; and each feather of the under surface having a crescentic mark of dark brown near the extremity. Young males closely resemble the females. There are other species of the genus.



SATIN BOWER-BIRDS AND NEST ($\frac{1}{3}$ nat. size).

Spotted Bower-Birds.

The five species of this genus differ from the preceding group by having the nostrils exposed, instead of completely hidden by silky plumes; while from an allied form they are distinguished by the nostrils being oval in shape and overhung by a membrane behind, as well as by the longer and more slender beak. In colour the upper-parts of the common spotted bower-bird (*Chlamydotera maculata*) are deep brown, as are also the wings and tail: each feather of the back and rump, as well as the scapularies, being tipped with a large buff patch; the under-parts are greyish white. The male is ornamented with a broad crest of rose pink, which is wanting in his partner.

Much similarity exists between the habits of the satin bower-bird and those of the spotted bower-bird. The latter species is, however, extremely shy,

and would often escape notice were it not for the harsh grating note with which it receives the intrusion of a stranger into its haunts. When disturbed it takes to the topmost branches of the loftiest trees, and frequently flies off to another neighbourhood. Gould states that he found several of the bowers or runs of this bird during his journey into the interior of New South Wales, both on the plains studded with small trees and in the brushes clothing the lower hills;



SPOTTED BOWER-BIRDS AT HOME ($\frac{1}{2}$ nat. size).

these were considerably longer and more avenue-like than those of the satin bower-bird, being in many instances 3 feet in length. "They are outwardly built of twigs, and beautifully lined with tall grasses, so disposed that their heads nearly meet; the decorations are very profuse, and consist of bivalve shells, crania of small mammalia and other bones, bleached by exposure to the rays of the sun or from the camp-fires of the natives. Evident indications of high instinct are manifest throughout the whole of the bower and decorations formed by this

species, particularly in the manner in which the stones are placed within the bower, apparently to keep the grasses with which it is lined fixed firmly in their places. These stones diverge from the mouth of the run on each side so as to form little paths, while the immense collections of decorative materials is placed in a heap before the entrance of the avenue, the arrangement being the same at both ends. In some of the larger bowers, which had evidently been resorted to for many years, I have seen half a bushel of bones, shells, etc., at each of the entrances. I frequently found these structures at a considerable distance from the rivers, from the borders of which they could alone have procured the shell sand small round pebbly stones; their collection and transportation must therefore be a task of great labour. I fully ascertained that these runs, like those of the satin bower-bird, formed the rendezvous of many individuals."

Gardener Bower-Bird.

The Papuan representative of the next genus (*Amblyornis inornatus*) has the beak less elevated than in the other genera, and the nostrils completely concealed. It is remarkable for building a kind of hut-like structure, fronted with what may be termed a garden, which displays a striking appreciation of beauty in its mode of arrangement. The hut, which is always placed at the foot of a large tree, is some two feet in height, and is formed of the stems of orchids, radiating and sloping from a central support, and roofed with a mass of moss, while round it runs a gallery. One side of the hut is left open, and in front of this is the garden, which is decorated with the bright-coloured berries and flowers, these being removed as soon as they wither. It may be mentioned here that the "bowers" of the whole group have nothing whatever to do with nesting, and appear to be erected solely for the amusement of the birds.

There are several other genera pertaining to the family, among which may be mentioned *Ælurædus*, as represented by the Australian cat-bird (*Æ. viridis*). Instead of building a bower, this species merely clears a space of ground, which may be some 8 feet in diameter, where the birds sport.



COMMON STARLING.

THE STARLINGS.

Family *STURNIDÆ*.

Following the arrangement of Dr. Sharpe, the next family on our list is that of the starlings, although Mr. Oates, in his *Birds of British India*, assigns it a very different position. All these birds agree in possessing a wing with five primary quills, and twelve tail-feathers; the beak being generally, although not invariably, slender and curved. The nostrils are clear of the line of the forehead; but the length of the metatarsus is variable. The characters in which the skull differs from that of the birds of paradise are noticed under that family.

Starlings are found throughout the Eastern Hemisphere, with the exception of New Zealand.

True Starlings. In the typical genus (*Sturnus*) the beak is as long as the head, and blunt at the tip and depressed, its edges being quite smooth; the wings are long and pointed, and the tail is short and squared. The members of the genus principally inhabit the temperate regions of Europe and Asia, as well as Northern Africa.

Common Starling. Breeding commonly in most parts of temperate Europe, although more rarely in the north than in the central districts of the Continent, the common starling (*Sturnus vulgaris*) is one of the most adaptive of birds, in consequence of which its range is steadily increasing. In the British Islands it has increased of late years to an extraordinary extent. So long as the starling contented itself with nesting sporadically in the pigeon-houses of farms and in hollow trees, as, for example, in the London parks, the public naturally desired to afford protection to so charming a bird; and there can be no doubt that it merits much interest, since it works assiduously to destroy the larvæ of such injurious insects as the crane-fly.

At the same time it is only right that we should take into account the heavy loss which fruit-growers frequently sustain from the inroads of hordes of hungry starlings; the extraordinary numbers of these birds which visit orchards of ripe fruit almost defying description. Quite recently the starling has developed an alarming fondness for ripe pears and apples; nor does he altogether disdain wild fruit; even the berries of the mountain-ash are much to his taste, and he constantly strips them with extreme pertinacity. When feeding on grass lands, in company with thrushes, the starling is apt to play the part of a bully, robbing his gentler neighbours of their fairly-earned subsistence.

In addition to being a vocalist of no mean order, the starling is a first-class mimic, and delights in reproducing familiar sounds with the greatest fidelity to truth. We have heard individual starlings reproduce the call-note of the skylark, goldfinch, wagtail, and other small birds; sometimes we have been startled on a winter's day to recognise the cry of the common sandpiper or the grating call-note of a fern-owl in the middle of a crowded city, and have discovered the author of our astonishment in the person of a starling, that is pouring forth his rhapsodies from some neighbouring chimney-top. Perfection is not easily acquired; but the starling practises his performances until he acquires a high measure of proficiency.

The starling does not, however, confine his attention to the reproducing the notes of other birds; any sound that strikes his fancy being rehearsed time after time, until the sharpest expert might be deceived. Not long ago, one of these birds astonished its human neighbours by reproducing the hammering of a stonemason, who had been engaged in dressing stone. The starling nests in April, and the young usually fly about the end of May: many pairs rearing two broods of young in a season. Some birds nest in the recesses of sea-caves in company with rock-doves and black guillemots: others rear their broods in the interior of old stone walls; while others again inhabit and enlarge the burrows of sand-martins in some perpendicular cliff: by far the greater number nest, however, about human habitations. In some

districts the fledged young gather together in dense flocks as early as July; and with the advance of autumn young and old congregate at their favourite roosts in prodigious numbers, feeding during the day in widely different localities, but flocking together at their favourite rendezvous before nightfall. Myriads of starlings migrate along the British coasts in spring and autumn; hence their presence at one or other of our lighthouses is frequently the subject of remark. Many individuals

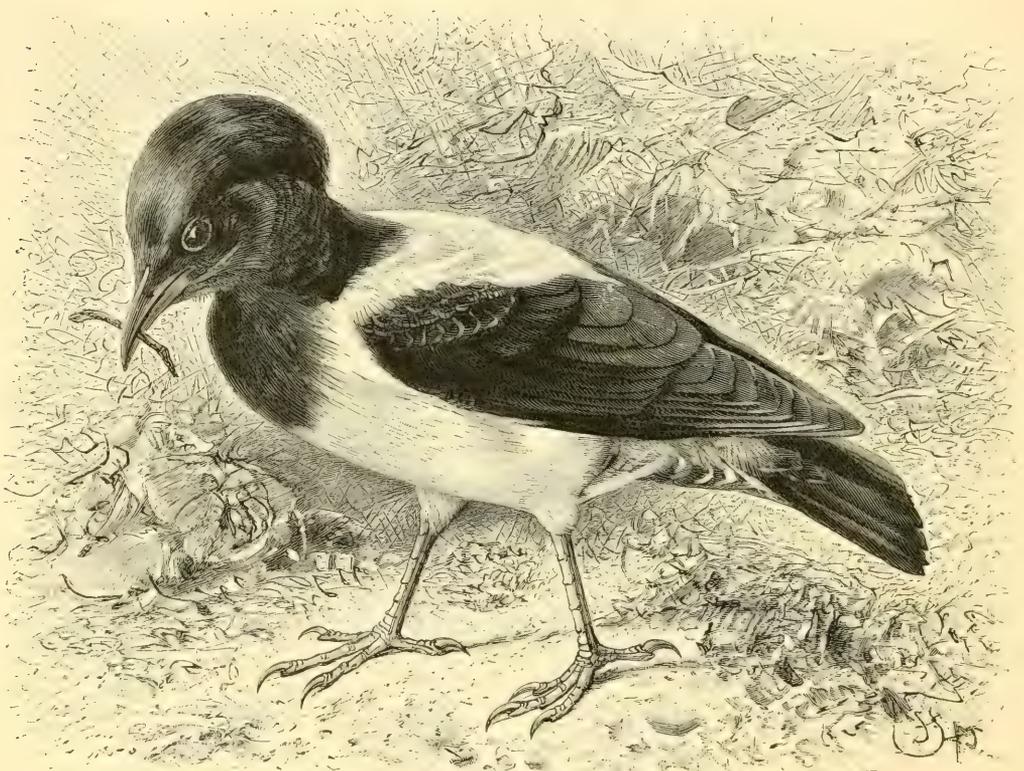


COMMON AND BLACK STARLING ($\frac{1}{2}$ nat. size).

bred in northern Britain winter in the midland counties, frequenting half-flooded meadows and other attractive haunts.

The male in summer has the plumage black brilliantly shot with purple-green and steel-blue; the feathers of the nape and upper-parts generally being tipped with buff in the form of triangular spots. Professor Newton points out that after the autumnal moult the starling is profusely spotted with buff, especially on the lower-parts, but in the spring many of these spots become obsolete. The plumage of the young is a dull brownish grey.

Black Starling. In Southern Europe the spotted starling of the British Isles is replaced by the black or Sardinian starling (*S. unicolor*), which is abundant in some parts of Spain and Portugal. Mr. Tait says that it is very common in the interior of Portugal, and that it is a very restless bird, often seen flying up and down in small flocks. Although some individuals reside in the Peninsula all through the year, the bulk of the black starlings, which breed in Spain, appear to pass the winter in Algeria, where they feed upon the fruit of the date-palms. This starling nests both under the eaves of outhouses and also in crevices of rocks. Its nesting habits are said to be identical with those of the



ROSE-COLOURED STARLING ($\frac{2}{3}$ nat. size).

common starling, and the egg is of a similar pale blue colour. The black starling has the entire plumage black, glossed with purple, without any spots whatever: the smaller feathers being very long and tapering. It is shown in the lower figure of the illustration on p. 345.

Rose-Coloured Starling. The single representative of the genus *Pastor* differs from the true starlings in having the head furnished with a long and conspicuous crest, reaching to the upper part of the back. One of the most beautiful of European birds, the rose-coloured starling (*P. roseus*), has its winter-home in India, from which country it is, however, absent during the breeding-season. Occasionally wandering as far north as the west of Scotland, this bird is very erratic in its habits, and many years have passed since it has been seen in any

considerable numbers in the British Islands. In the summer of 1875, vast numbers visited Villa Franca; a small flock making its appearance on June 3rd, and alighting on the high ruined walls within the castle, and being followed in about half an hour by another flock of about one hundred. In a short time many people assembled at the places, and soon witnessed another sight, for towards evening appeared many thousands of these starlings, which, joining with first comers, stopped there till dusk, when they dispersed in numerous troops over the open country. On the following day from twelve to fourteen thousand rose-coloured starlings arrived and took entire possession of the castle; driving away by the force of superior numbers the common starlings, pigeons, and all other birds that nested in the ruins, and proceeding to fill every available hole and fissure. The birds began to lay about the 17th of June, the eggs being of a uniform white colour with a greenish tinge. The young were hatched about the 10th July, and were fed exclusively upon locusts. The old birds foraged in the country in flights of from ten to twenty, or even forty, returning in the same united fashion to their offspring. The rose-coloured starling is one of the most sociable and cheerful of birds. "Always busy and restless," says Signor de Betta, "it may be seen running here and there, accompanying every movement with its cries. The song of the male is a continual chatter, mixed with harsh and disagreeable sounds; both one and the other begin in the early morning, continuing for a length of time, and renewed at intervals after feeding. The males, always at strife, may be seen pursuing one another and exchanging blows with their bills, while in the most curious attitudes and with their long black crests elevated and expanded. They exhibit great affection for the hen birds which, never leaving the nest during the period of incubation, are protected and fed by them with all assiduity." These birds will not unfrequently associate with the common starling; and they retain their vivacious character even in captivity, where they form some of the most charming of aviary birds, darting to and fro on rapid flights or singing from some favourite perch. The male in summer-plumage has the head, crest, wings, and tail black, with a blue or violet gloss; the back and breast being of a beautiful rose colour, which is suffused with brown in the winter plumages. The young are uniform light greyish brown above, with the wings and tail dark brown edged with buff; the throat and lower parts being dull buffish-white.

Other Genera. There are numerous other genera of the family into the consideration of which the limits of our space forbid our entering. Among these are the true mynas (*Sturnia*) of India, distinguished from *Sturnus* by the beak being more slender, shorter than the head, and narrowing to a point; and differing from the allied *Agropsar* by the middle tail feathers being longer than the outer pairs. The pied starling (*Sturnopastor*) of India, as well as the African wattled starling (*Dilophus*), likewise belong to this group.

Ox-Peckers. Among the most useful of South African birds, from their habit of feeding on the parasites which infest domestic and other cattle, the ox-peckers are very unlike starlings in general appearance; from which they are distinguished by the beak being stout, broad at the base, and nearly straight, with the nostrils bare. The wings are long, with the first quill very short, and

the second nearly equal in length to the third; the tail being long, broad, and wedge-shaped; while the feet are strong, and furnished with sharp-curved claws, by means of which the birds retain their hold on the slippery skin of buffaloes. One species of ox-pecker inhabits North-Eastern Africa, Senegambia, and the Transvaal; while the South African ox-pecker (*Buphaga africana*) is found in Natal, and the red-billed species (*B. erythrorhyncha*) in most parts of Central Africa.



RED-BILLED OX-PECKER ($\frac{1}{2}$ nat. size).

These birds fly in small parties of six or eight, and have a somewhat laboured flight; they may be observed climbing over the oxen in a team, much as a woodpecker climbs a tree; and the cattle for the most part enjoy the operation of being freed from the ticks and other pests with which they are infested. On the first arrival of a flock of these birds, the cattle are, however, apt to be alarmed, and start



GLOSSY STARLINGS.

off as if they had been attacked by gad-flies. It must not be supposed that these birds confine their attention to cattle, since they perform the same kind of offices for rhinoceroses, elephants, antelopes, and probably almost all the larger African mammals.

Although not loud, the notes of the ox-peckers are harsh and grating; and are always uttered when a flock approaches cattle to feed. Nothing appears to be ascertained as to the breeding-habits of these birds. In the figured species the general colour of the upper-parts is greyish brown; the wings being black, the tail brown, the throat grey, the under-parts pale fulvous, and the beak red.

* GLOSSY STARLINGS AND GRACKLES.

Family *EULABETIDÆ*.

Whereas the true starlings and their allies have no trace of bristles at the rictus of the gape, and lay uniformly coloured eggs, the members of the present African and Asiatic family possess such bristles, and lay spotted eggs. Moreover, the members of the present family are mainly or entirely arboreal, instead of hunting for a large portion of their food on the ground.

African Glossy Starlings. The most beautiful members of all the starling-like birds are undoubtedly the African glossy starlings, of which a group of three species is represented in our coloured illustration. All the African glossy starlings are neatly-built birds, with the beak strong, of moderate length, compressed, swollen at the base, and notched; the nostrils being situated about the middle. The wings are large, the feet long and strong, and the tail of variable length; while the plumage is remarkable for its brilliant gloss, being generally adorned with shades of bluish green, violet, purple or copper-colour. Such species as have long graduated tails may be included in *Lamprotornis*, while those in which the tail is short and squared are classed as *Lamprocolius*. The glossy starlings are gregarious birds, ranging all over Africa, and feeding on vegetable as well as animal substances. Uttering harsh clamorous notes, they are rapid in their flight and lively in their movements; and while generally dwelling high up in the branches of the forest trees, they descend at times to pick up insects and other food on the ground. From the retiring habits of most of the species, they are but seldom seen. They either build in holes of trees, or make large cup-shaped nests, in which are deposited five or six spotted eggs.

Long-Tailed Glossy Starling. This species (*L. aneus*), which is the one represented in the upper figure of our coloured Plate, is a denizen of West Africa, although also ranging into the southern, eastern, and central districts of that continent. Measuring about 20 inches in total length, of which two-thirds are occupied by the long, graduated tail, this bird has the head, chin, and upper part of the throat black, with a golden lustre; the upper-parts and wings being dark metallic green, and the upper wing-coverts ornamented with small black spots; the middle of the throat, as well as the upper tail-coverts, tail, and under-parts being dark purple-violet, marked with darker cross-bands; while the middle of the breast is copper-red. The upper wing-coverts have black spots. The iris of the eye is yellow;

and the beak and feet are black. Feeding largely upon insects, these birds are more terrestrial in their habits than many others of the group.

Green Glossy Starling. The green glossy starling (*Lamprocolius chalybeus*), which is shown in the lower figure of our Plate, is an inhabitant of North-Eastern Africa, and is selected as a good example of the second genus of the group. With the exception of a spot in the region of the ear and the under wing-coverts, the whole plumage is of a steely bluish green, the secondaries and the feathers of the upper wing-coverts being marked at the end with a round blackish spot. Such



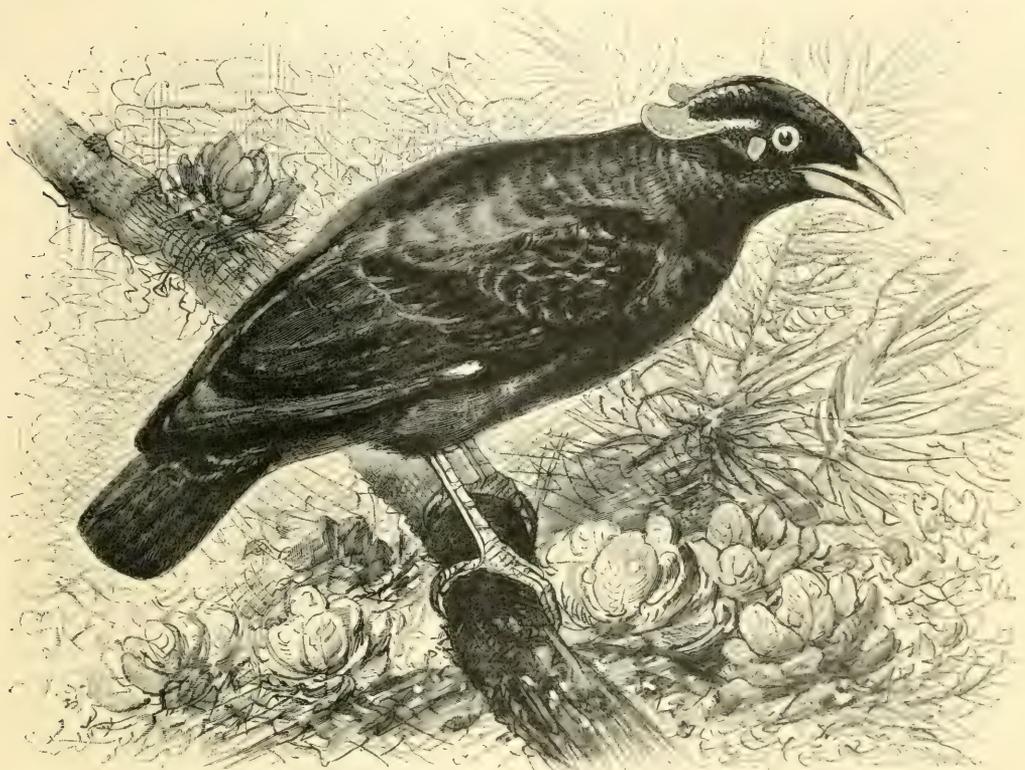
THE SUPERB GLOSSY STARLING.

is the wonderful shimmer of the plumage, which is similar in both sexes, that it shows totally different tints according to the light, and indeed can scarcely be described in words. In the young only the upper-parts are metallic green, the under-parts being dark brownish grey, devoid of lustre.

Although typically an inhabitant of Abyssinia, this beautiful bird ranges into Senegambia. It frequents alike the thickly-wooded river-valleys and the high mountains, ascending in Abyssinia to an elevation of some ten thousand feet; and while generally going about in pairs, in the breeding-season congregates in small flocks. Both in flight and general habits it resembles the European starling.

White-Bellied Glossy Starling. The pretty little bird (*L. leucogaster*), depicted in the middle figure of the Plate, is our last representative of the group, and differs

considerably in coloration from the foregoing species. The whole of the upper-parts and the throat, as far as the breast, are purplish blue, with a wonderful violet shimmer in certain lights; while the remainder of the under-parts are white, and the wings blackish brown, with a violet tinge; the whole of the darker portion of the plumage being shot with a coppery lustre. This bird is distributed over the whole of Central Africa, and extends northwards into Abyssinia and Western Arabia. A truly arboreal species, it is found both on the plains and in the



SOUTHERN GRACKLE ($\frac{2}{3}$ nat. size).

mountains, generally associating in parties of from six to twenty individuals: its general habits being very similar to those of the other members of the group.

The Grackles, Not to be confounded with the true mynas, mentioned later on, **or Hill-Mynas.** the grackles, or hill-mynas of India and the adjacent regions, are birds of glossy black plumage, easily distinguished by the presence of fleshy yellow or orange wattles on the head. The beak is thick, high, curved, and shorter than the head; while the feathers of the crown are short and inwardly curved, with a kind of parting down the middle of the head: the wing being rather blunt, the tail short and nearly squared, and the foot strong.

The southern grackle (*Eulabes religiosa*), of Southern India and Ceylon may be taken as a well-known example of the genus; and is distinguished from the others by having bare skin on the sides of the neck, and two long patches on the neck. Its whole plumage is glossy black, with the exception of a patch of white

at the base of most of the primaries; the wattles are naked, being rich yellow, the beak orange-yellow, and the legs and feet citron-yellow. The total length of the adult is about 10 inches. Young birds have a dull black plumage, and are devoid of wattles.

Like its kindred, this bird is either resident in one spot throughout the year, or only locally migratory; it is chiefly confined to the large forests of Western India or Ceylon; but other species inhabit the outer Himalaya. The southern grackle breeds from March to October; generally laying only a pair of eggs, which are deposited in holes in trees. Its food consists entirely of various fruits, which it obtains among the higher branches of its native forests. All the grackles learn to whistle and talk when in captivity, and as they are excellent mimics they are much prized by the natives of India as cage-birds.

Asiatic Glossy Starlings. These birds differ from the grackles in having no wattles; their plumage is highly glossy; the beak is short, with the culmen curved; the nostrils are small and round; and the wing is long and sharp, and the tail of moderate length, and graduated. Mr. Oates remarks that he is not aware how nearly related these birds are to the African glossy starlings, although there appear to be important differences between some of them. The range of the genus extends from South-Eastern Asia to Australia; the Indian glossy starling (*Calornis calybeïus*) being the only representative in the country from which it takes its name. The whole plumage is black, with a brilliant green gloss on most of it.

* THE DRONGOS.

Family *DICRURIDÆ*.

The drongos, or king-crows, of South-Eastern Asia and Africa, form an easily recognised family, which is placed here by Dr. Sharpe, although Mr. Oates considers that its affinities are rather with the creepers, while other writers place it with the shrikes. Their generally black plumage, and deeply-forked tail of ten feathers, serve at once to distinguish drongos from all other members of the order. The edges of both mandibles are smooth, with a single notch in the upper one; the wing has ten primary quills, and the nostrils are clear of the line of the forehead. Both sexes are alike; and the young differ from their parents only by their plumage being paler. Several of the species have the head crested, and there are always bristles at the base of the beak. Entirely insectivorous, the drongos are habitually upon the wing, darting from a tree to catch an insect, and returning speedily to the same or another perch; and they are likewise fairly endowed with vocal powers.

Much alike in general characters, these birds present considerable difficulty in distinguishing the genera and species. In addition to the typical genus *Dicrurus*, as represented by the Indian black drongo, or king-crow (*D. ater*), ranging from Afghanistan to China, and several other species, Mr. Oates recognises no less than six genera of the family in India. Two species, which may be included in the type genus, are found in South Africa; while Australia has but a single representative (*Chibia bracteata*). The black drongo, which has the entire plumage deep black

with a steely-blue gloss, but the under tail-coverts generally tipped with white, is one of the most familiar of Indian birds, both in the hills and the plains, generally selecting the most exposed and barren tree or post for its perching-place. The nest, which is generally placed in a thickly-leaved bough, is composed of fine twigs and



THE BLACK INDIAN DRONGO.

grass, covered externally with cobwebs. Usually four, although occasionally five in number, the eggs may be either uniformly pure white, or salmon colour with brownish spots. Not unfrequently this bird may be observed perched on the back of cattle searching for insects.

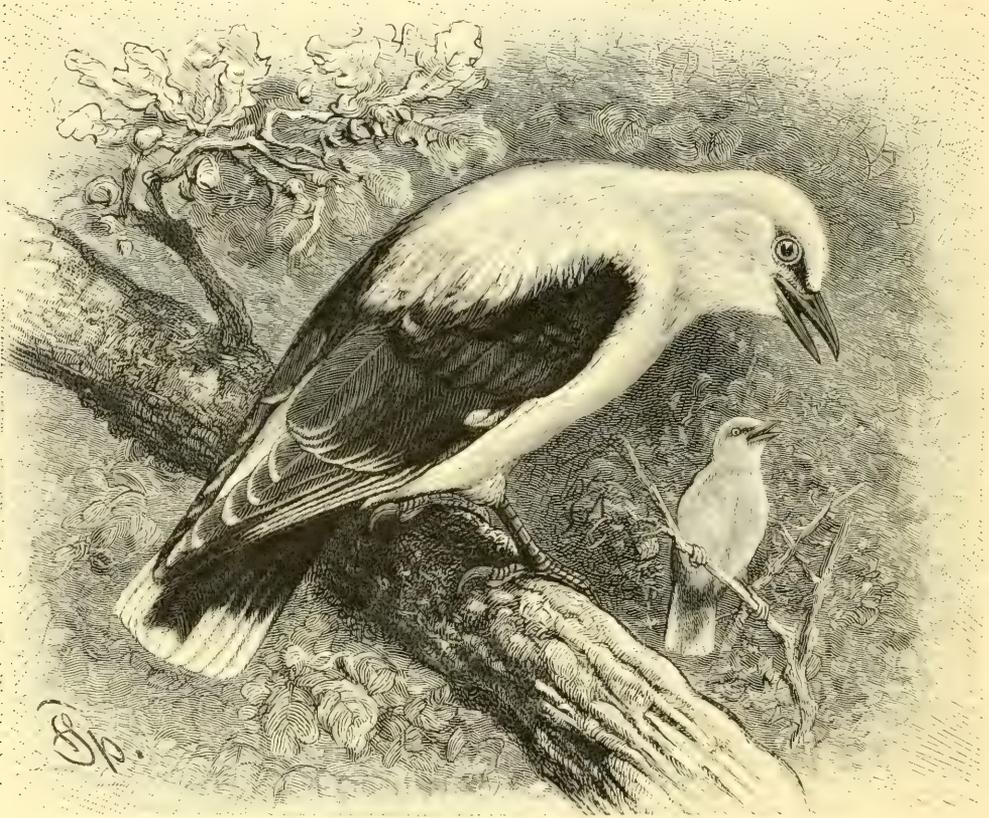
THE ORIOLES.

Family *ORIOLIDÆ*.

The orioles comprise a number of birds from the temperate and tropical portions of the Old World, in which the bill is as long as the head, and gently curved to the tip, where it is notched; the head is never crested; the wings are long, with the first three quills equally graduated, and the third and fourth longest; while the tail is moderate and rounded; and the toes are free at the base, and have long curved claws. The nostrils are bare, and placed well in front of the base of the beak, and this character, together with the presence of twelve tail-feathers, at once distinguishes them from the drongos. Brilliant yellow generally adorns the plumage of the male orioles; in others the lower-parts are variegated with rich crimson. They are birds of frugivorous habits, and frequent forest trees in

preference to smaller cover. They are divided only into two genera, of which *Oriolus* has the lores feathered, while in *Sphcotheres* they are naked. Orioles inhabit the temperate parts of Europe, the whole of Africa, India, China, the Malayan Provinces, the Indian Islands, and Australia.

Golden Oriole. Of the numerous birds visiting Northern Europe in the spring no species is better known than the golden oriole (*O. galbula*), at which time this bird may be observed migrating in small numbers; both sexes journeying in company. At this season the birds are silent, and seem anxious to



THE GOLDEN ORIOLE ($\frac{1}{2}$ nat. size).

escape notice, although, as they arrive before the beech trees (which clothe the mountain-sides in the north of Spain) have unfolded their leaves, they have some difficulty in concealing their brilliant plumage among the bare twigs. The oriole on the Continent reaches its nesting-haunts about the end of April, and at once claims its own peculiar area of forest. Each pair confines itself to a certain portion of a great wood, the intrusion of a strange male into the haunts of a pair of breeding birds being certain to result in a fight. Although the golden oriole is shy and retiring in Europe, its cousin is by no means so in India, where it often perches on a tree immediately over the tent of the traveller, and there pours out its flute-like notes. In addition to these flute-like tones, both sexes have also a cat-like call. The nest is usually placed on a bough,

and the young are attended with remarkable care by the parents. Although feeding mainly upon insects, which are often taken on the ground, the golden oriole during the fruit-season lays toll on the orchard. The range of the golden oriole includes the whole of Europe, except the extreme north, as well as Persia and other parts of South-Western Asia. In winter this species visits South Africa. The bright colour of the male golden oriole renders it peculiarly liable to be attacked by the sparrow-hawk; and, in such a contingency, the oriole does not trust to his thrush-like flight enabling him to elude his tormentor in the open, but on the earliest opportunity seeks refuge in the densest thickets available as cover. The oriole forms a good cage-bird; although old birds are not easily reconciled to the loss of their freedom, and are apt to pine away. Young birds, on the other hand, are easily tamed.

The adult male of this species is rich golden-yellow above; the wings being black, the primary coverts broadly edged with yellow, which forms a conspicuous spot; the tail is black, tipped with yellow, the outer feathers having more yellow than black; while the entire under-surface is golden-yellow. The female differs from the male in having the back and scapulars tinged with green.

Green Oriole. Among thirty odd species of the genus, we may select for mention the green oriole (*O. viridis*) of New South Wales, which frequents orchards and gardens, where it fills the summer air with its melodious notes. This oriole, says Prof. Ramsay, may often be seen perched on some shady tree, with its head thrown back, showing to perfection its mottled breast, singing in a low tone, and imitating the notes of many birds, such as the black magpie. While feeding, it frequently utters a harsh guttural sort of squeak: and, during the breeding-season, which commences at the end of September, and ends in January, it confines itself to a monotonous although melodious cry, the first part of which is quickly repeated, and ends in a lower note. This oriole builds a cup-shaped nest, principally composed of shreds of the bark of a species of gum-tree, strongly woven together, and lined with leaves, or grass and hair; which is generally suspended between a fork at the extreme end of some horizontal bough, often in an exposed situation. The eggs vary in ground-colour from cream to dull white or very light brown, minutely dotted and blotched with umber and blackish brown. Green orioles feed principally on berries and wild fruits, particularly figs; although they sometimes capture insects on the wing. The adult male is dull yellowish olive above: the wings and tail being brown, washed with grey; while the throat is dull olivaceous: the fore-neck greyish, and the breast and sides of the body white, washed with olive-yellow, each feather having a dark central streak. The sexes when adult are almost identical in colour, but the male has the olive of the upper-parts of a deeper tint than the female.

* THE CASSIQUES AND HANGNESTS.

Family *ICTERIDÆ*.

To a certain extent intermediate in structure between the crows and the finches, and agreeing with the starlings in the general structure of the skull, and

especially the backward prolongation of the hinder extremity of the lower mandible, the large assemblage of American birds known as cassiques and hangnests may be regarded as the New World representatives of the starlings of the Old World, although, so far as habits are concerned, it does not appear that there is any very marked structural affinity between the two families. Distinguished by the length and slenderness of the beak, which in most cases equals the head in



THE CRESTED CASSIQUE ($\frac{2}{3}$ nat. size).

length, these birds generally possess pointed wings, which have never more than nine primaries; they have strong feet, and chiefly black plumage. Among the numerous genera only a few can be selected for notice. Congregating in flocks, after the manner of starlings, many of these birds build the long, pendent, bottle-like nests, from which the name of the family is derived. The family may be divided into three groups, the first comprising the rice-birds and cow-birds, the second the true hangnests, and the third the troupials; the characters of which are pointed out below.

Cassiques. The first subfamily (*Cassicinae*) is represented by several closely allied genera, among which the crested cassique (*Ostinops decumanus*) of South America, and the yellow cassique (*Cassicus persicus*), which is likewise South American, are well-known species. It will be unnecessary here to mention the characters by which these genera are severally distinguished from one another; and it will suffice to say that the subfamily to which these belong is characterised by the naked exposed nostrils, and the presence of a shield on the forehead at the base of the beak. The crested cassique is characterised by the small crest from which it takes its name; and while the general colour of the upper-parts is deep black, with the feathers of the mantle and shoulders shaded with brown, and the upper and lower tail-coverts chestnut, the five outermost pairs of tail-feathers are a brilliant citron-yellow. The elongated form of the nest characterising the crested cassique is sufficiently indicated in our illustration.

The True Hangnests. The true hangnests, as represented by a large number of species ranging from North and Central America to Southern Brazil and Bolivia, constitute (together with an allied genus containing one species) a second subfamily (*Icterinae*) in which the nostrils are more or less covered by a membrane, while the culmen of the beak is more or less incurved, and there is no shield on the forehead; the metatarsus being short, the feet adapted for perching, and the tail rounded. As a rule, the plumage is bright orange and yellow, relieved with black and white; the sexes being in some cases similar, and in others very dissimilar. Unlike the members of the preceding subfamily, these hangnests are thoroughly arboreal in their habits, and while the majority construct pendant nests like those of the cassiques, others appear to build open cup-shaped nests. The eggs are bluish or pinkish white, profusely spotted with purple and red. The best known species is the Baltimore hangnest (*Icterus galbula*), frequently termed the Baltimore oriole, of the United States. These birds build in large companies, the males generally arriving first at the breeding-places, where they are soon joined by their partners. The nest is wider and less elongated than that of the crested cassique. On a single tree sometimes as many as forty nests may be observed; and during November they will be found to contain both eggs and young birds. All the numerous species of the genus *Icterus* are good songsters, the notes of the Baltimore hangnest being especially melodious.

Rice-Birds. Belonging to another subfamily (*Agelaiinae*) differing from the last by the straight culmen of the beak and the elongated metatarsus, this genus, as typified by the common rice-bird or bobolink (*Dolichonyx oryzivorus*), is characterised by the short and conical beak, the long and pointed wings, the rigid acuminate feathers of the tail, and the stout and long-clawed feet. An inhabitant of North America, where it is especially common in the States, this well-known bird winters in Central America and the West Indies, returning northwards in vast flocks along the Atlantic coast in spring, when the males are in nearly full breeding-plumage, and are thus very conspicuous as they flock to the meadows and orchards. "Their number," says Dr. Coues, "seems out of all proportion to that of the females, but this is probably due to the silent and more retiring ways of the latter sex. They really pass through, in the vernal migration, quite rapidly, though they do not

appear to be at all in a hurry, as we see them by day. They throw themselves in a field, scatter on the ground feeding, and at the slightest alarm, or in mere wantonness, suddenly fly *en masse* to the nearest tree, fence, or bush, and begin to sing, producing an indescribable medley, hushed in an instant only to be resumed. Sometimes they sing as merrily, though with less concerted action, while they are rambling in the grass. Their daytime leisure for song and food is easily explained: for they migrate at this season almost entirely by night. Every night in early May, as we walk the streets, we can hear the mellow metallic clinking coming down through the darkness, from birds passing high overhead, and sounding clearer in the stillness. By the middle of May they have all passed; a few, it is stated, linger to breed south of New England, but the main body passes on, spreading over that portion of the Union and the neighbouring British provinces, occupying in pairs almost every meadow. The change of plumage is completed before the return movement is made." Millions return on their southern journey, late in the summer and during September. They are now songless, but have a comfortable, self-satisfied *chink*, befitting such fat and abandoned gourmands as they are, thronging in countless hordes the wild rice-tracts and the grain-fields. So they go until the first cold snap that sends them into winter-quarters at once. The bobolink nests upon the ground, making a rude and flimsy structure of dried grass, which is artfully concealed. It lays four or five eggs, bluish-white in ground-colour, blotched and spotted with dark chocolate. The male in the breeding-season has the head and lower-parts black; the hind-neck buff; the scapulars, rump, and upper tail-coverts ashy white; the interscapulars streaked with black, buff, and ashy; and the outer quills edged with yellowish. The nuptial garb just described is, however, unlike the plain plumage worn by both sexes after the breeding-season, when the general colour of the plumage is yellowish brown above, and brownish yellow below; the crown and back being conspicuously streaked with black, and the wings and tail blackish.

Cow-Birds. Nearly allied to the last genus, the cow-birds possess a short, conical bill, long and pointed wings, slightly rounded tail, and strong feet. In the majority of the species black is the prevailing colour, being sometimes lustrous, with bronzed reflections. The cow-birds are mainly a South American genus, although one species is only too well known in the United States. Some of the species seize upon the nests of other birds, and having driven away the rightful possessors, proceed to rear their own young in their new home. The majority, however, are more truly parasitical, depositing their eggs in other birds' nests, and leaving the strangers to hatch and rear their own offspring. The common cow-bird (*Molothrus pecoris*) of the United States is a polygamous species: the sexes never mating, and their association being merely a herding together in quest of food. "In the West," says Dr. Coues, "every waggon-train passing over the prairies in summer is attended by flocks of these birds; every camp and stock coral, permanent or temporary, is besieged by the busy birds, eager to glean subsistence upon the wasted forage. Their familiarity under these circumstances is surprising. Perpetually wandering about the feet of the draught animals, or perching upon their backs, they become so accustomed to man's presence that they will hardly get out of the way. I have even known a young bird to suffer itself to be taken in the

hand; and it is no uncommon thing to have the birds fluttering within a few feet of one's head. The animals appear to rather like the birds, and suffer them to perch in a row upon their backbones, doubtless finding the scratching of their feet a comfortable sensation, to say nothing of the riddance from insect parasites."

The cow-bird's foster-parents are numerous, notably the summer yellow-bird, the Maryland yellow-throat, and the red-eyed vireo. It is rare to find more than two eggs of this cow-bird in a single nest, although as many as five have been found together. In colour the eggs are white, speckled with brown. The adult



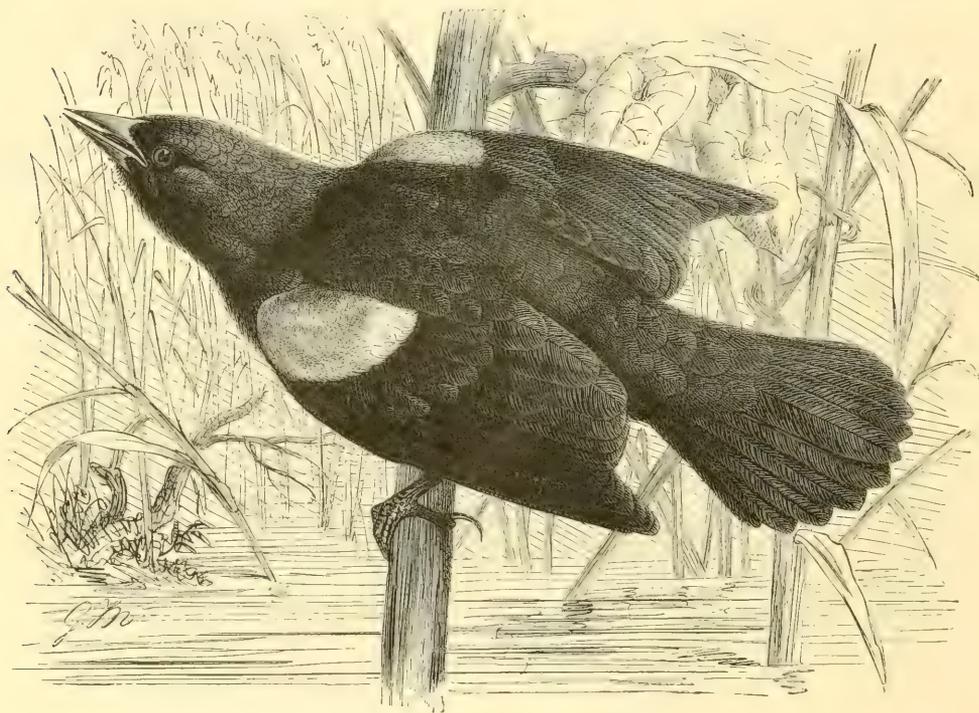
THE COMMON COW-BIRD ($\frac{1}{2}$ nat. size).

of the common cow-bird is of a lustrous greenish black, with blue and purple reflections: the head and neck being deep wood-brown, with some purplish lustre. The female is dull coloured, of a nearly uniform greyish brown above, and paler beneath.

Writing of a South American member of the genus, Mr. W. H. Hudson observes that the male of the "screaming cow-bird of La Plata, when perched, emits a hollow-sounding internal note that swells at the end into a sharp metallic ring, almost bell-like; this is uttered with wings and tail depressed, the whole plumage being puffed out as in a strutting turkey-cock, while the bird hops

briskly up and down on its perch as if dancing. The bell-like note of the male is followed by an impetuous scream from the female, and the dance ends. Another species, the common Argentine cow-bird (*M. bonariensis*) of La Plata, when courting, puffs out his rich violet plumage, and, with wings vibrating, emits a succession of deep internal notes, followed by a set song in clear, ringing tones; and then suddenly taking wing he flies straight away, close to the surface, fluttering like a moth, and at a distance of twenty to thirty yards turns and flies in a wide circle round the female, singing loudly all the time, hedging her in with melody as it were."

Red-Shouldered Starling, etc. The bill in this genus is about as long as the head, stout at the base, and tapering rapidly to an acute point; while the wings are pointed, and the tail broad. Black associated with red or yellow is the predominant-

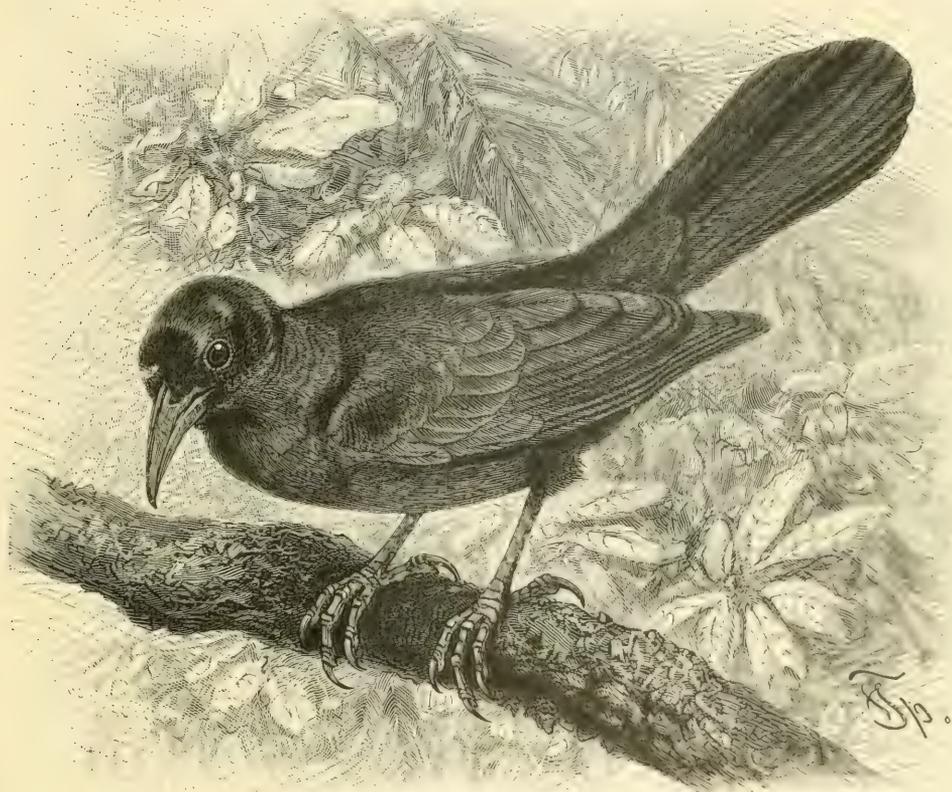


RED-SHOULDERED STARLING (♂ nat. size).

ing colour of the male birds, but the females are more soberly attired. Several species are found in Central and Southern America, while others are peculiar to the United States. The type of the genus is the red-shouldered starling (*Agelaius phoeniceus*), a bird commonly distributed throughout temperate North America, and especially abundant among the marshy tracts of the Eastern States. It nests in reeds and bushes near the ground or in a tussock of grass, building a bulky nest of coarse fibrous materials, such as strips of rushes or marsh grass. The eggs are pale blue, dotted and blotched with dark markings. In autumn this bird becomes highly gregarious, thronging in the grain-fields, where it does much mischief. The male is lustrous black, with the lesser wing-coverts scarlet, broadly bordered

with brownish yellow; while the female is blackish brown above with pale streaks, and below whitish with many dusky streaks. The young male bird at first resembles the female, but is larger, and generally suffused with buff.

Omitting mention of several genera of the family, we come to a genus, *Quiscalus*, of the third subfamily or group, rejoicing in a variety of names, such as crow-blackbirds, grackles, and boat-tails, but as the first two of these are liable to lead to confusion, it is better to adopt for them the French name of troupials, which, however, is often applied to the family. In



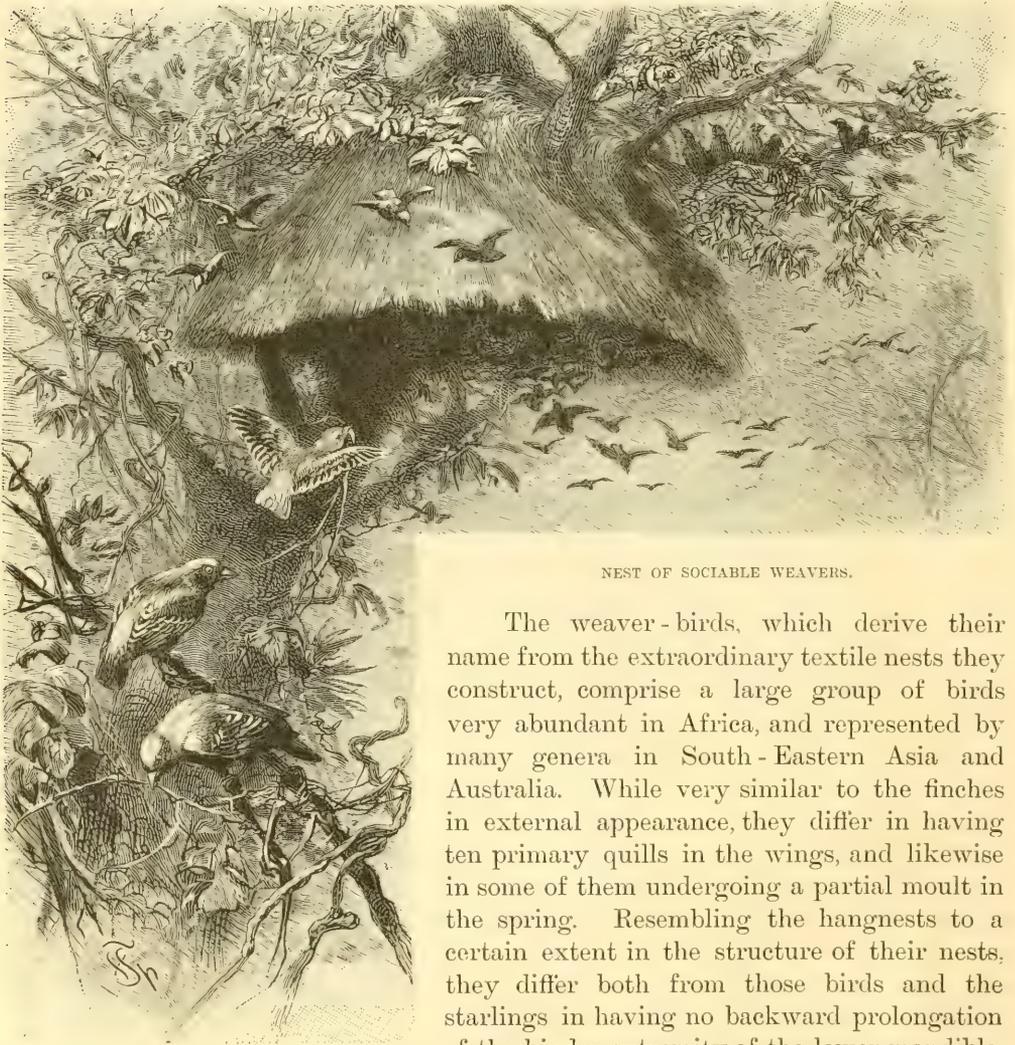
THE PURPLE TROUPIAL ($\frac{2}{3}$ nat. size).

these the beak is equal in length to the head, and somewhat crow-like in shape; the wings are relatively short, the tail of varying length, and the feet long. The best known member of the genus is the purple troupial (*Q. purpureus*) of the Atlantic States, the other species being more southern in their distribution. It is a migratory gregarious bird of very general distribution, building in a tree or bush, and making a large nest, usually of mud. The eggs are generally green or blue in ground-colour, variegated with dark brown and purple markings. These birds at times inflict great injury upon the crops, much to the annoyance of the agriculturist: but they also destroy large quantities of injurious insects. They have a propensity for destroying the eggs of other birds, especially those

of the American robin or migratory thrush, lurking about the robin's vicinity until the parents are away, and then pouncing on the nest, seizing an egg or young one, and hastily retreating. The adult male is black above and below, variously glossed with green, purple, blue violet and bronze; the female is similar but her tints are more subdued.

* THE WEAVER-BIRDS.

Family *PLOCEIDÆ*.



NEST OF SOCIABLE WEAVERS.

The weaver-birds, which derive their name from the extraordinary textile nests they construct, comprise a large group of birds very abundant in Africa, and represented by many genera in South-Eastern Asia and Australia. While very similar to the finches in external appearance, they differ in having ten primary quills in the wings, and likewise in some of them undergoing a partial moult in the spring. Resembling the hangnests to a certain extent in the structure of their nests, they differ both from those birds and the starlings in having no backward prolongation of the hinder extremity of the lower mandible.

Having a strong conical beak, with the culmen projecting on to the forehead and arched at the tip, they have the nostrils pierced within the line of the forehead or close to it, while the space between the nostril and the edge of the mandible is



WEAVER BIRD

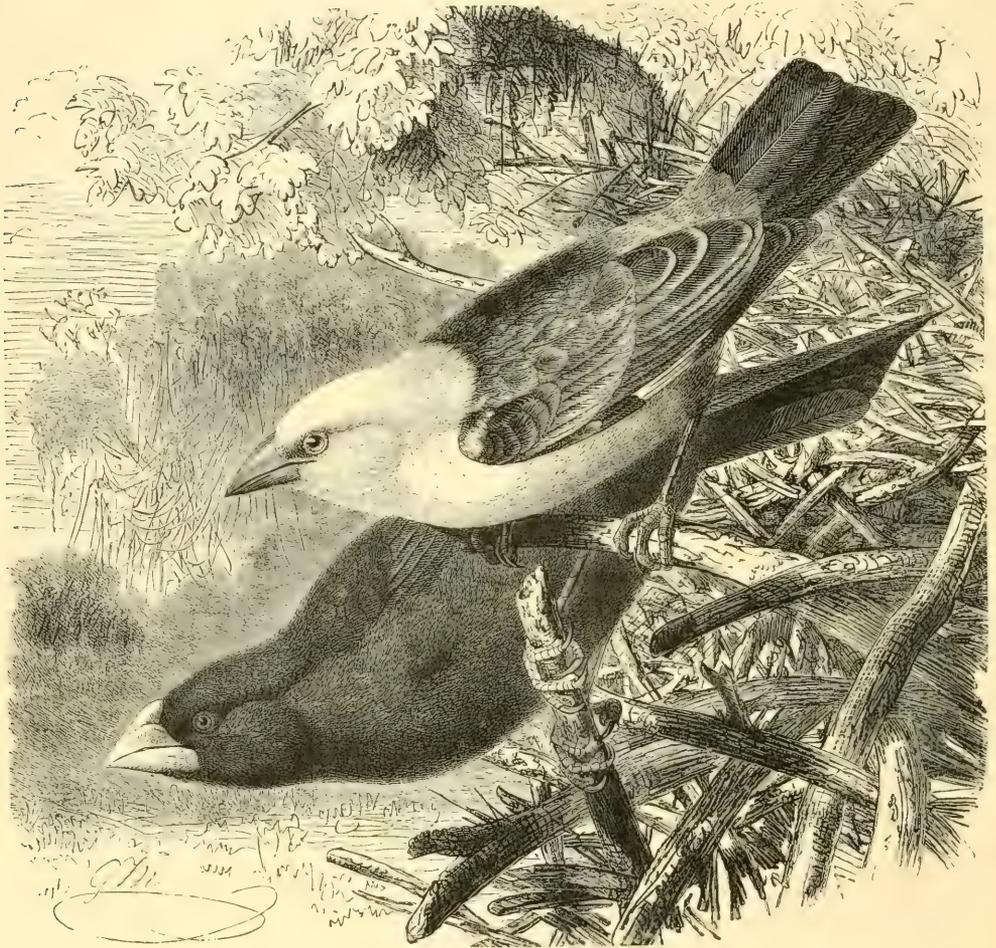
greater than that between the former and the culmen; there is never any distinct notch in the upper mandible. The wings are somewhat rounded, with the first primary quill very short, while the legs and toes are stout and strongly scaled. The family may be divided into two groups or subfamilies, namely, the typical weaver-birds, or *Ploceinae*, in which the first primary of the wing is nearly as long as the metatarsus, and there is a spring moult; and the whydah birds and their allies, or *Vidwinae*, in which the first primary is much shorter than the metatarsus, and the only moult is autumnal.

The Ox-Birds and their Allies. Commencing with the first or typical subfamily, we have first to notice the small African genus of true ox-birds, which have a rather long, conical, and laterally compressed beak, the wings somewhat rounded and reaching a little below the base of the tail, with the second primary quill only a little shorter than the third and fourth, which are the longest; the tail being of moderate length and somewhat rounded, while the claws are strong and curved. This genus is typically represented by the common ox-bird (*Tector alector*) of Western Africa, shown in the background of the figure on p. 364. This bird has a nearly uniform shining black plumage, with the bases of the contour feathers white, the beak being horny yellow, with its tips and edges bluish, and the feet blackish grey.

The red-billed black weaver (*T. niger*) is found in the Transvaal, Damaraland, and the lake regions; the possession of a red bill easily distinguishing this large finch-like and very noisy bird. It is gregarious in its habits, breeding in colonies, the members of which construct many nests in a single tree. The nests consist externally of an immense mass of dried grass, twigs, and sticks, in which are to be found from four to six separate nests or holes of an oval form, composed of grass only, but united to each other by intricate masses of sticks defying the ingress of any intruder except a small snake. In each of these separate holes are laid three or four eggs exactly resembling sparrows' eggs, but much larger. Curiously enough, the birds roost in these nests which are used year after year, any injury to the structure being at once repaired by all the members of the community. Sir Andrew Smith found this bird frequenting herds of buffaloes, and perching on their backs in search of the parasitical insects which infest their hides. Like other birds of the family, it feeds upon berries, seeds, and insects. The general colour of the adult male is black, with the first half of each wing-feather white; but the young bird has some whitish patches on the neck and breast.

White-Headed Weaver. This weaver (*D. leucocephala*), which represents another genus, is a comparatively small species found in the interior of Africa and Abyssinia. Like other members of the family, the present species is absent from dense forests, preferring to dwell upon grass-lands in the more open portions of the country. It is by choice somewhat gregarious, taking up its abode on rough meadow-lands, and seeking out the neighbourhood of cattle. Although a true weaver, it does not construct so neat a nest as most of its allies. The adult male has the head and under-parts white, the back wings and tail chocolate-brown, and the rump and tail-coverts scarlet; it is depicted in the upper figure of the illustration on the next page.

The True Weaver-Birds. The true weaver-birds form the comparatively small group, common to East and West Africa and the Oriental region, exclusive of the Philippine Islands. While in all the preceding genera the culmen of the beak is flattened at the base and sometimes crested, in the present and allied genera it is rounded at the base; the true weaver-birds being specially distinguished by having the nostrils rounded and exposed, and the claw of the



COMMON AND WHITE-HEADED OX-BIRDS ($\frac{1}{2}$ nat. size).

first toe very strong and highly curved. The genus *Ploceus* is confined to the Indian and Malayan regions, and is typically represented by the common weaver-bird, or baya (*P. baya*) of India and Ceylon. All these birds construct long flask-shaped nests, with a tubular entrance, and lay pure white eggs.

Masked Weaver-Bird. The masked weaver-bird (*Hyphantornis larvata*), of Abyssinia, may be taken as a well-known representative of an exclusively African genus, with over thirty species, which may be distinguished from the last by the exposed oval nostrils being partly reached by the plumes at the base, and also shut in by a horny membrane. The figured species may be

recognised by the scarlet iris of the eye, the black beak, and greyish black legs. It is reported to lay pale bluish green eggs, with a few violet-brown spots at the larger end. An allied species from the same district is the Abyssinian weaver-bird (*H. galbula*), in which the iris is orange-brown, the beak black (except in the breeding-plumage of the male, when it becomes horn-coloured), and the leg flesh-coloured. A third form is the olive weaver-bird (*H. capensis*) of South Africa. Generally living in flocks, the members of the last-named species are more numerous in the Transvaal than in Natal. According



ABYSSINIAN AND MASKED WEAVER-BIRDS ($\frac{2}{3}$ nat. size).

to Mr. Ayres, they are fond of sucking the honey from the scarlet flowers of the Cape broom. The nest is constructed of coarse grasses, and formed somewhat in the shape of a chemist's retort, with the neck cut short and the aperture downwards; while across the entrance runs a kind of bar to prevent the eggs from falling out. This nest is lined with the soft flowering heads of grass, which furnish a warm bed for the young. The eggs are of a beautiful, spotless green colour. Mr. Layard says that these weavers become very tame in confinement, and will readily answer to the call. If they are supplied with cotton or thread, they will weave it most industriously into the bars of the cage, forming a dense mass which it is impossible to unravel. This work they perform entirely

with their bills, clinging the while to the sides of the cage with their powerful claws. They have a loud churring cry. The adult has the crown of the head and the sides of the neck gamboge-yellow; the nape, back, and rump are lemon-yellow; the back of the neck and shoulders greenish yellow; the wing-feathers a dark purplish brown edged with yellow; the tail olive-brown tinted with yellow; while the throat and lower-parts are saffron-yellow.

Paradise Whydah With this exclusively African genus (*Vidua*) of long-tailed and **Birds.** strikingly-coloured birds we come to the second subfamily, the distinctive characters of which have been already indicated. The paradise-whydah birds, of which there are several species, may be taken to include all those in which the two central pairs of tail-feathers of the males are greatly elongated, although they are frequently subdivided into distinct genera, according as to whether some or all of these feathers are attenuated and wire-like. The long-tailed whydah bird (*Vidua paradisica*), represented in the upper part of our coloured Plate, is an inhabitant of South Africa, where it frequents swampy ground and the long reeds about ponds. Its flight is feeble. In the breeding-season especially, when the male has assumed his nuptial livery and long tail-feathers, the flight is so laboured that the children constantly run them down. They are quite unable to fly against the wind, and in rainy weather can hardly be got to move out of the thick bushes in which they conceal themselves. The Kaffir children stretch bird-lined lines across the fields of millet and Kaffir corn, and take great numbers of the males by their tails becoming entangled in the lines. This bird builds its nest in long grass close to the ground, generally placing it in a tussock of herbage, to the blades and stalks of which it is roughly joined. The nest itself is rather a rough structure, composed of fine grass lined with the seed-ends; the opening is at the side. Mr. Bowker states that the average number of females is as fifteen to one male. He adds that the long tail worn by the male in the breeding-season is not an inconvenience; and the bird never seems to enjoy himself so much as during a high wind in which he shows off to advantage, spreading his tail out like a fan. The male in nuptial plumage is of a general glossy black; the feathers of the shoulders are fulvous and brilliant crimson, and the tail is enormously developed. The female plumage is of a pale yellowish brown, but the wing-feathers are black with pale yellowish brown edges.

Bishop-Birds. Nearly the whole of the remaining genera of the subfamily have the tail shorter than the wing; and among these some of the most remarkable are the gorgeously-coloured bishop-birds of Africa, a group of which is depicted in the right lower half of our coloured illustration. These birds have the tail squared, with the two central feathers not markedly produced beyond the rest; while the feathering of the body is soft and velvety; and there is a distinct winter and summer plumage, in the latter of which a frill is developed round the neck. Among the handsomest of the group is the red bishop-bird, or red Kaffir finch (*Pyromelana oryx*), of the Cape Colony, Natal, and the Transvaal. A bird of social habits, gathering together in immense flocks both in winter and summer, which during the latter season appear to consist almost entirely of males in their gaudy red and black plumage, the red bishop-bird breeds in the month of September, constructing

its nest of fine grass and suspending it among the reeds of the rivers. The eggs are pure light blue. In winter the flocks of bishop-birds do much damage to the grain-fields. It is often imported into Europe as a cage-bird. The adult male in nuptial plumage has the upper-parts, throat, and vent, brilliant scarlet: the wings and tail are brown, and the forehead, cheeks, and chin black. After the breeding-season is over, the male assumes the brown plumage of the female. Another common bird throughout the Cape Colony is the black-and-yellow bishop-bird (*P. capensis*), affecting alike the loneliest swamps and the homesteads of farmers.



SOCIABLE WEAVER-BIRD ($\frac{2}{3}$ nat. size).

It breeds in the neighbourhood of water, constructing its nest of strong grasses and suspending it between the stalks of two or three reeds. The eggs are very pale green, thickly marked with dark greenish brown blotches and spots. This bishop-bird generally lives in small companies in the open fields, and feeds chiefly upon grass seeds. The adult male has the head and upper-parts rich velvety black, the rump and shoulders brilliant yellow, and the wings brown.

Sociable Weaver-Birds. The birds of this genus, *Philaterus*, which are likewise exclusively African, differ from the bishop-birds in having the plumage similar throughout the year, and no frill round the neck, while they are distinguished from several allied forms by having the nostrils clearly exposed and placed well in front of the plumes at the base of the beak, and by the small size of the bastard-primary.

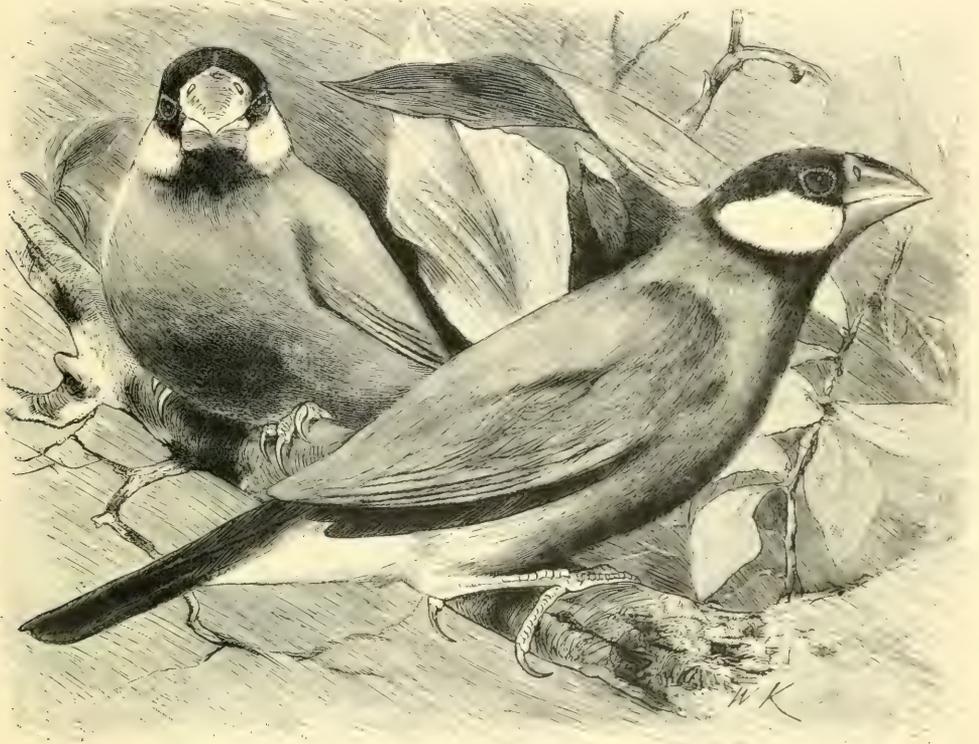
Among the four representatives of the genus the best known is the common sociable weaver-bird (*P. socius*), of the interior of South Africa. This species congregates in large flocks, many pairs incubating their eggs under the same roof, which is composed of whole cartloads of grass piled on a branch of some camel-thorn tree in one enormous mass of an irregular umbrella shape, looking like a miniature haystack and almost solid, but with the under surface (which is nearly flat) honeycombed all over with little cavities, which serve not only as places for incubation, but also as a refuge against rain and wind. Dr. Guillemard remarks that the nests of the sociable weaver-birds probably last for a great number of years. They are constantly being repaired by their active little inhabitants. It is curious that even the initiated eye is constantly being deceived by these peculiar domed-topped structures, since at a distance they closely resemble native huts. The nesting-chambers themselves are warmly lined with feathers. The sociable weaver-bird subsists chiefly upon seeds, and often feeds in company with many individuals of its own kind. The eggs are drab in ground-colour, closely speckled with purple-grey. The male birds are somewhat pugnacious, frequently indulging in fights with their rivals. The plumage of the adult males is drab-brown above, edged with grey. The chin is black and the under-parts are pale isabelline brown, the flanks being varied with black, edged with whitish.

Cut-Throat Weaver-Finches. With these birds we reach a group of genera in which the nostrils are more or less completely hidden by the nasal plumes, and which are specially distinguished by the tail being somewhat elongated and its feathers narrow, as well as by the pointed wing and the swollen and rounded beak, in which the cutting-edge of the upper mandible is festooned near the base. The genus *Amadina* includes three African species, one (*A. fasciata*) having the throat marked by a crimson band extending to the ear-coverts. This species ranges across Central and Northern Africa, and is represented in South Africa by another (*A. erythrocephala*), in which the whole of the head and throat are red.

The Munias. It would be impossible in the limits of our space to point out how the munias are distinguished from all their allies, but it may be mentioned that the central tail-feathers are produced and pointed, while the whole tail is wedge-shaped. They possess a powerful, swollen, and rounded beak, which is most strongly developed in the common Java sparrow. The wings are moderately long; and the tail is graduated and rounded at the extremity. Some thirty species of munias are known, ranging through the Oriental region to New Guinea and Timor, while several species also inhabit the African continent; Sharpe's munia being a native of West Africa, while *Munia nana* is found in the island of Madagascar. The Java sparrow is also known in Africa, but as an introduced bird, and in Zanzibar, Mauritius, and Réunion, just as it has become wild in parts of India, as at Madras and in Tenasserim.

One of the commonest of cage-birds in Europe is the well-known rice-bird, paddy-bird, or Java sparrow (*M. oryzivora*), which has long been domesticated. Latterly, indeed, pure white specimens have been extensively bred in confinement, and have become an article of trade, being valued for their snowy plumage, which harmonises with their pink bills. In Java and other parts of Asia this munia is

regarded as a pest on account of the ravages which it inflicts upon growing fields of rice. The nest is constructed of dry grass or other available materials, and the eggs are white. The adult male has the crown of the head black; the cheeks are pure white; the upper and lower parts, including the wings, are uniform slate grey; the rump and tail are black. Some individuals possess a song of considerable sweetness, but the usual note of this species is commonplace and unattractive.



JAVA SPARROW.

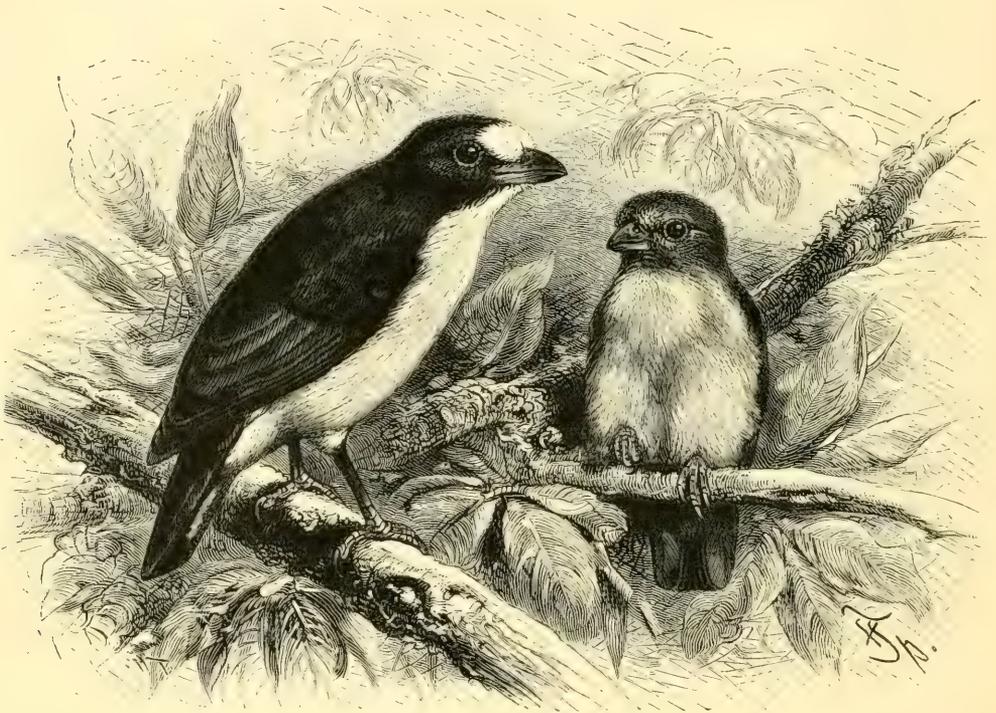
The Blood Weaver-Finches. The last group of the family to which we shall refer is that of the blood weaver-finches. These birds have the tail longer than the wing, the inner secondaries so elongated as to equal the primaries in length, the beak curved, and the nostrils entirely hidden by plumelets. As typically represented by the waxbill weaver-finch (*Estrilda astrilda*), they take their name from the prevalence of scarlet in their coloration, and are naturally confined to Africa and Arabia, although some have been introduced into Madagascar and St. Helena. There are about a dozen species.

* THE TANAGERS.

Family *TANAGRIDÆ*.

Numerous both as regards species and genera, and brilliant in coloration, the tanagers have been not inaptly described as dentirostral finches. Since they possess

a conical, finch-like beak, triangular at the base and notched near the tip. The notch in the beak is, however, scarcely apparent, or obsolete in some of the genera, while in others it is greatly developed. Chiefly remarkable for their gay colours, the tanagers feed much more upon fruits and insects than is the case with the finches, while some members of the group possess vocal powers of a high order. All have but nine primary quills in the wing. Exclusively American, the family is represented by upwards of four hundred species, the majority of which are restricted to the inter-tropical regions of Central and South America, although a few migrate as far north as the United States in summer.



VIOLET TANAGER (nat. size).

Violet Tanager and its Allies. Of the six subfamilies into which the tanagers are divided by Selater, the violet tanager (*Euphonia violacea*) and its allies constitute the typical representatives of the second. In this group the beak is short, swollen at the base, but not very much broadened; while the hooked upper mandible usually has two or three slight serrations behind the terminal notch. The wings are moderate, with the first three primaries longer than the rest, and nearly equal in length, while both the tail and metatarsus are short. The violet tanager is a lovely little bird, with a rapid flight, frequenting the very tops of the trees in which it dwells, its soft, tuneful note often denoting its presence before the musician itself is seen. The nest of the violet tanager is comparatively large for so small a bird, spherical in shape, built of dry grass, the finer stems of creepers, and tufts of cotton. The interior is lined with tufts of grass. From three to four eggs are laid in a clutch, reddish yellow in colour, spotted with small brown spots. The strain of this

tanager consists of a succession of pleasing notes, softly poured forth and long sustained. The violet tanager is a little gourmand, and feeds eagerly on ripe fruit; preferring soft fruits, such as bananas, and plundering the gardens so eagerly as sometimes to fairly strip a whole tree. It flourishes as a cage-bird if supplied with plenty of room, fed upon an adequate variety of fruits, and kept in a warm room. The latter precaution is necessary, since this bird is susceptible of cold and cannot bear frost. The adult male has the upper-parts violet; the forehead and lower-parts are pure yellow; the tail-feathers are steel blue above, dark beneath. The female lacks the ornamental colours of her partner, being of a dull olive-green above, beneath yellowish grey.

The splendid scarlet tanagers belong to the typical subfamily, in which the beak is more lengthened and awl-like than in the last, with a single terminal notch, which may be obsolete; while both the tail and metatarsus are long. Of some two hundred species included in the subfamily, the typical tanagers (*Tanagra*) have the plumage blue and yellow, while in the present genus scarlet generally predominates in the coloration of the males. Writing of the species (*Pyrranga rubra*) in the United States, Mr. Nuttall observes that "this splendid and transient resident, accompanying fine weather in all his wanderings, arrives in his winter station in tropical America from the beginning to the middle of May, and extends his migrations probably to Nova Scotia as well as Canada. With the shy, unsocial, and suspicious habits of his gaudy fraternity, he takes up his abode in the deepest recesses of the forest, where, timidly flitting from observation, he darts from tree to tree like a flashing meteor. A gaudy sylph, conscious of his brilliance, and the exposure to which it subjects him, he seems to avoid remark, and is only solicitous to be known to his humble mate, and hid from all beside. He therefore rarely approaches the habitations of men, unless, perhaps, the skirts of the orchard, where he sometimes, however, builds his nest, and takes a taste of the early and inviting though forbidden cherries." The nest is built on the horizontal branch of some shady forest tree, constructed of stems of dry weeds, or slender fir twigs loosely framed together, lined with slender roots and wiry stems, the whole nest being so loosely welded together as to admit the light between the interstices. The eggs are dull blue, spotted with two or three shades of brown or purple. The female scarlet tanager is a devoted parent, and shows great maternal solicitude for the safety of her young. Even the male of this species has been known to follow one of his brood for half a mile, feeding it with insects through the wires of the cage in which it was confined. The scarlet tanager is the "red-bird" of Americans. Unfortunately, its crimson body, contrasting with wings and tail black as night, makes it only too conspicuous an object, the never-failing bait to the greed of the dealer in bird skins. The adult bird is uniform scarlet above, with the wings and tail pure black. The female is far less exposed to danger than her mate, being clear olive-green above, and below greenish yellow, with the wings and tail dusky, glossed with green. Adult males often show abnormal colouring, the body being yellow, orange, or flame colour, or red patches appearing on the wings.

Crimson-Headed Tanager. Another gorgeously-coloured representative of the tanagers is the crimson-headed tanager (*P. ludoviciana*) of the Western United States and Mexico. In Southern Colorado Mr. Henshaw found this tanager in small numbers

among cotton-woods along the streams, at an elevation of about seven thousand five hundred feet, and much more abundantly among the pines, up to nine thousand feet and even ten thousand feet above sea level. He afterwards observed that it was common in Southern Arizona, and found it lingering along the Gila River, even so late as the middle of October, at which time nearly all these birds had migrated southward. As others had done, he noted the close similarity that obtains between this and the scarlet tanager. "It is busy the whole time gleaning from among the pines and spruces the larger beetles and insects which infest them, and generally keeps well up among the higher branches, whence it makes its presence known by occasional bursts of melody." Dr. George Suckley gave the following account of this species:—"The beautiful Louisiana tanager is quite abundant in certain seasons in the vicinity of Fort Steilacoom. In 1854 but a limited number made their appearance, while, on the contrary, in the summer of 1856 I could readily have obtained a hundred specimens. I have had frequent opportunities of studying their habits, and have never yet seen them descend to ground as stated by Nuttall, the reverse being the rule (at least at Paget Sound); the difficulty being generally to find the bird sufficiently low down on fir-tree branches to allow fine shot to reach it with any degree of certainty. . . . The favourite habitat of the species, in those localities where I have observed it, is among the tall, red fir trees belonging to that magnificent species, the *Abies douglasi*. They seemingly prefer the edges of the forest, rarely retiring to its depths unless for concealment when alarmed. In early summer, at Fort Steilacoom, they are generally seen during the middle of the day, sunning themselves in the firs, occasionally darting from one of these trees to another, or to some of the neighbouring white oaks on the prairies. Later in the season they may be seen very actively flying about in quest of insect food for their young. Both sexes during the breeding-season are much less shy; the males during the daytime frequently sitting on some low limb, rendering the scene joyous with their delightful melody." The eggs of this tanager are green, sparingly dotted with very dark purplish brown.

White-Capped Tanager. One of the loveliest of the family is the white-capped tanager (*Stephanothorus leucocephalus*), a summer visitor to Argentina, where, says Mr. W. H. Hudson, "it makes its appearance in spring in the woods bordering on the Plata River, and is usually seen singly or in pairs. The nest is built in a tree ten or twelve feet from the ground, and is somewhat shallow and lined with soft dry grass. The female lays four eggs, white and spotted with red. During incubation the male sits concealed in the thick foliage close by, amusing itself by the hour with singing, its performance consisting of chattering disconnected notes, uttered in so low a tone as to make one fancy that the bird is merely trying to recall some melody it has forgotten, or endeavouring to construct a new one by jerking out a variety of sounds at random. The bird never gets beyond this unsatisfactory stage, however, and must be admired for its exquisite beauty alone." Azara named this species the "Blue White-Headed Beautiful," and the term was justified, for the entire plumage of both sexes is a lovely deep corn-flower blue, surmounted by a cap of silvery-white feathers; a crimson spot ornamenting the forehead, looking like a drop of blood.

THE HONEY-CREEPERS.

Family CEREVIDÆ.

These birds constitute a small group of some forty species. They are allied to the true warblers, so closely indeed, that some of the latter possess the deeply bifid, pencillate tongue, which was once supposed to be peculiar to the honey-creepers. Unlike the creepers of the Old World, the honey-creepers have soft-



WEST INDIAN HONEY CREEPER OR BANANA-QUIT ($\frac{1}{2}$ nat. size).

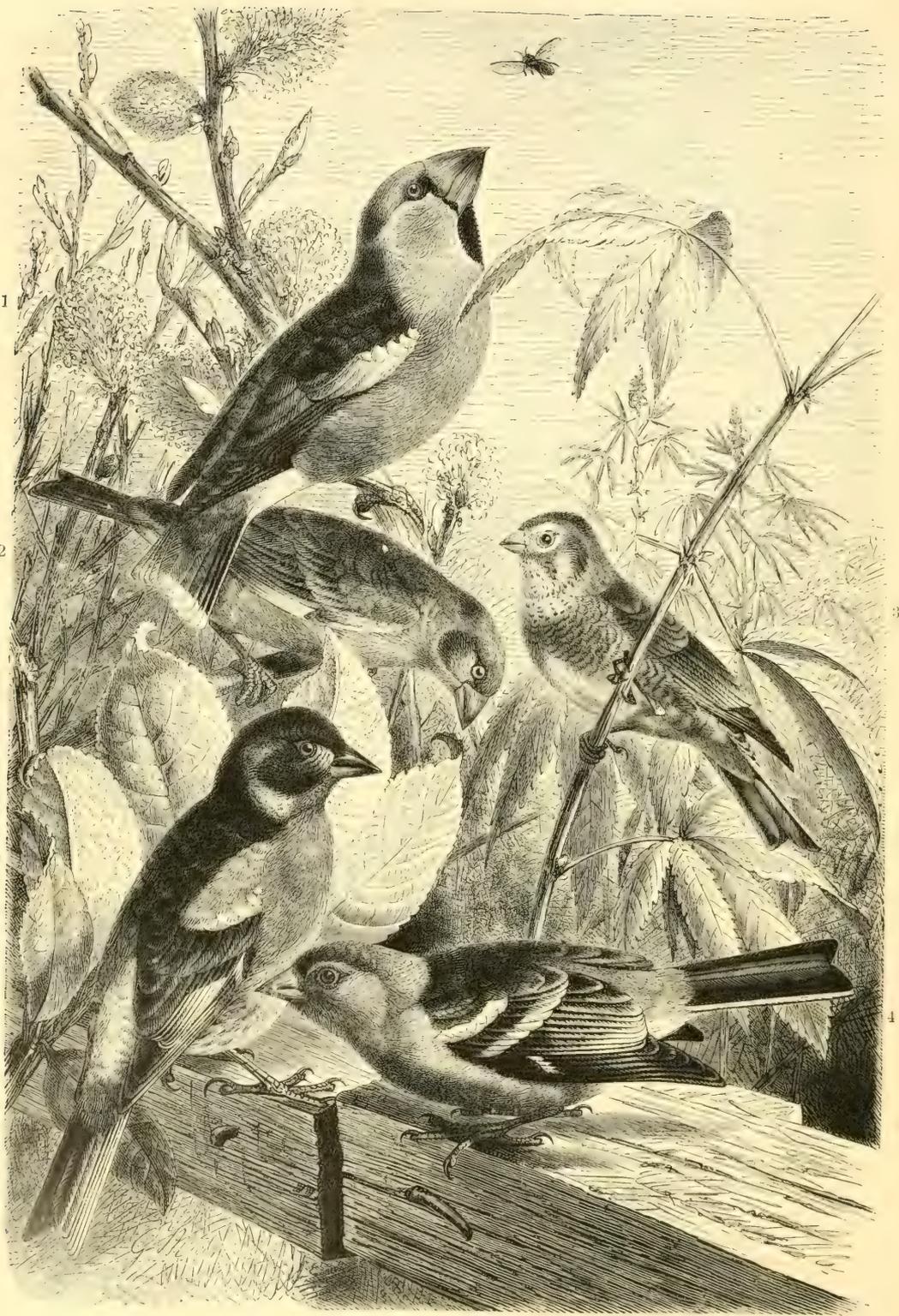
feathered, squared tails. They are almost wholly confined to the tropical parts of South America, only a single species ranging as far north as Florida; but they are most numerously represented in the islands of the West Indian group.

West Indian Honey-Creepers. Among the various genera of the family, we select for notice the West Indian honey-creepers, of which a species (*Certhiola flavicola*) is represented in our illustration. The members of this genus have the beak rather shorter than the head, stout at the base, but tapering rapidly to the extremely acute tip, and the whole bill much curved: the wings are long, but the tail is short and rounded.

Banana-Quit. The habits of this, the figured species, have been best described by Gosse, in his work on the *Birds of Jamaica*. Scarcely larger than the average size of the humming-birds, 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 for which its short wings would be utterly incompetent, the banana-quit alights on the tree, and proceeds in the most business-like manner to peep into the flowers, hopping actively from twig to twig, and throwing the body into all positions, often clinging by the feet with the back downwards, the better to reach the interior of a blossom, with its curved beak and pencilled tongue. The minute insects which are always found in the interior of flowers are the objects of his search and the reward of its perseverance. Unsuspectingly familiar, these birds often resort to the blossoming shrubs of gardens and yards. A large moringa tree, that is profusely set all the year through with fragrant spikes of bloom, is a favourite resort of both these and the humming-birds. One within a few feet of my window is, while I write this note, being actively scrutinised by two active little creatures, that pursue their examination with a zeal perfectly undisturbed by my looking on, while the same blossoms are rifled on one side by a minute humming-bird, and on the other by that gorgeous butterfly, *Urania sloaneus*—an interesting association. The quit often utters a soft, sibilant note as it peeps about. The nest of this bird is very frequently, perhaps usually, built in those low trees and bushes from whose twigs depend the paper nests of the brown wasps, and in close contiguity with them. The grass-quits are said to manifest the same predilection; it is a singular exercise of instinct, almost of reason, for the object is doubtless the defence afforded by the presence of the formidable insects, but upon what terms the league of amity is contracted between the neighbours I am ignorant. It is in the months of May, June, and July that the creeper performs the business of incubation. On the 4th of May 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. The structure, though but a skeleton, was evidently about to be a dome, and so far was constructed of silk-cotton. Since then I have seen several completed nests. One before me is in the form of a globe, with a small opening below the side. The walls are very thick, composed of dry grass, intermixed irregularly with down." The eggs are greenish white, speckled with reddish at the larger end. In colour the upper-parts of this species are dark brown, with a conspicuous white eyebrow: the breast and the rest of the under-parts being bright yellow.

H. A. MACPHERSON.

[NOTE.—The account of those families to which an asterisk is prefixed has been entirely or in great part written by the EDITOR.]



GROUP OF FINCHES.

1, Hawfinch ; 2, Greenfinch ; 3, Linnet ; 4, Brambling ; 5, Chaffinch.

CHAPTER III.

THE PERCHING-BIRDS,—*continued.*

THE FINCHES.

Family *FRINGILLIDÆ*.

THE finches comprise a large number of genera of small hard-billed and seed-eating birds, distributed over the northern and temperate regions of both the Eastern and Western Hemispheres, although unknown in Australia. They are characterised by the smooth edges of the mandibles; the doubly laminated hinder-surface of the metatarsus; the presence of nine primary quills of which the first and second are approximately equal in length; while the secondary quills reach about three-quarters the length of the wing. The tail has twelve feathers; the beak is more or less conical in shape, with the nostrils pierced close to the line of the forehead, and near the culmen; and the bristles at the rictus of the gape are few and short. The lower mandible has no backward prolongation behind the quadrate bone. In the nestling the plumage is variable; and the sexes are generally unlike. By Mr. Oates the finches are divided, from the characters of the skull and beak, into three subfamilies, of which the first is

THE GROSBEEK GROUP.

Subfamily *COCCOTHAUSTINÆ*.

A general stoutness of beak is accompanied in this group by marked development in the depth of the lower mandible; many of the species, such as the evening grosbeak of North America, being noticeable for the beauty of their coloration. The members of the grosbeak group are inhabitants of the northern regions of both the Old and New Worlds, and extend as far south as India.

Greenfinches. These birds have the bill moderately stout and rather acute; the distance between the nostrils being equal to the depth of the mandible. Green and yellow predominate in the plumage. The greenfinches inhabit the whole of Europe, as well as North-West Africa, Palestine, and Turkestan; while they are also represented in Eastern Siberia, Japan, and China. The common greenfinch (*Ligurinus chloris*) is fond of gardens and small plantations, especially during the summer, when its monotonous song is heard at intervals throughout the day. It has, however, some soft and plaintive notes which, once heard, will always be remembered with pleasure. Nor is this bird devoid of

imitative talent, becoming excessively tame and confiding, and having been known to reproduce the song of the canary. Yarrell states that the greenfinch is a late breeder, but while fresh eggs may sometimes be found in a nest as late as the month of September, we once saw a newly-fledged greenfinch taking short flights from bough to bough as early as the 19th May. The greenfinch builds a coarse, untidy nest of fibrous roots, moss, and wool, lined with finer roots, horse-hair, and a few feathers. A remarkable combination of two nests of the greenfinch built on a single platform, and placed in a large ornamental heath, is recorded by Gurney. The greenfinch is fond of building in the neighbourhood of water, hence the young birds occasionally tumble out of the nest and are drowned. The eggs are white, spotted with reddish brown and grey. The greenfinch not unfrequently pairs with the canary in confinement; and in a wild state occasionally mates with the goldfinch. The hybrids resulting from the latter cross most resemble the greenfinch in shape and colour, but the head and wings never fail to show the goldfinch blood. The greenfinch also interbreeds with the linnet, and in confinement has produced offspring by pairing with the bullfinch and twite. During the autumn greenfinches range the fields in large flocks, feeding on the seeds of wild mustard and many other pests of the husbandman. The male greenfinch is olive-yellow above, overshadowed with ashy grey; the under surface of the body being yellow. The South European form is smaller and brighter than the birds which breed in the British Isles and Northern Europe. Yellow, black, white, and cinnamon varieties of the greenfinch have come under our notice.

Hawfinches. The hawfinches are readily distinguished by their large and clumsy bills, which are adapted to enable them to feed upon hard kernels. Hawfinches are found in suitable localities throughout Europe and Siberia. The Japanese form is paler and lighter in colour than the European (*Coccothraustes vulgaris*); while Hume's hawfinch (*C. humei*) is an Indian species, differing from the European birds in having a lighter and less richly-coloured head, and by the sides of the body being pale tawny or orange-brown instead of vinaceous. The hawfinch is a well-known bird in many parts of Europe, and is locally distributed over England, although rarely visiting Scotland, and uncommon in Ireland. It frequents the skirts of forests, especially where hornbeam flourishes, since it feeds on the seeds of that tree. Seldom seen in open country, it resides in gardens and orchards, especially during the summer months; its flight being rapid and undulating. The male should be seen in bright sunshine, if his beauty of plumage is to be appreciated; the light being admirably adapted to burnish up his deep brown back and blue-black wings. The hawfinch is a shy bird, and seldom courts attention; when alarmed, its first action is to crouch close to the branch upon which it happens to be perching, so as, if possible, to escape unnoticed. Mr. Seebohm remarks that "the hawfinch is not much of a songster. It has few notes, which can scarcely be called more than a low chatter. There is nothing very striking in its performance; but when several are twittering away together the general effect is very pleasant. Its call-note is said to resemble the well-known *zh* of the greenfinch. The hawfinch pairs about the middle of April, and its nest is rarely built before the trees are in full foliage. The site of the nest differs considerably. A favourite place is in the apple or pear-trees in an orchard,

or in an old whitethorn often in quite an exposed situation; and when it breeds in woods it sometimes selects a hornbeam, and less frequently a holly. The hawfinch does not often breed in shrubberies, and its nest is somewhat rarely placed in evergreen trees; but it has been found amongst ivy. It will also breed in tall oak-trees, and occasionally nests in fir-trees and plantations. Sometimes the nest is only a few feet from the ground, while at others it is as much as forty feet. Building is usually commenced by the latter end of April or early in May, and sometimes several nests will be found in the same plantation. The nest is a very beautiful piece of handiwork, similar to that of the bullfinch, on an enlarged scale. The outside is invariably made of twigs, frequently intermixed with lichens, and sometimes with dry plants; and the cup is formed of dry grasses lined with fine roots, and often a little hair. As a rule it is very flat, and somewhat bulky, and the cup is generally shallow and neatly finished. The eggs vary from four to six in number, and are usually laid about the second week in May, sometimes earlier. There are two very distinct types; the usual one is pale olive or bluish green in ground-colour, streaked with dark olive-brown, and having a few spots of the same colour on the surface, and with underlying markings of greyish brown. The second differs in having the ground-colour buff, and the underlying spots more inclined to violet-grey." During the autumn the broods of young hawfinches lead a family life, making frequent inroads into the kitchen gardens to feed upon peas; the pods of which are easily opened by their powerful mandibles. In winter the hawfinch sometimes conquers its shyness sufficiently to approach houses, and even to partake of crumbs thrown upon the lawn; but this is in hard weather, when the birds are driven to extremities. It should be noted that the injuries inflicted on the garden are compensated by the destruction which the hawfinch carries out among noxious insects; its food during the early months of the summer consisting principally of caterpillars. The general colour of the adult male is chocolate-brown above, with a broad collar of ash-grey separating the crown of the head from the mantle; the lower-back, rump, and upper tail-coverts are cinnamon-brown; the wings black, glossed with steel blue at the end of the square-shaped inner primaries and outer secondaries; the primaries have a large spot of white about the middle of the inner web; the tail-feathers are blackish, edged with brown, the outer feathers being tipped with white on the inner web; while the throat is black, and the lower-parts vinaceous brown.

Rose-Breasted Grosbeak, etc. In these birds the bill is very heavy, the lower mandible being as deep as the upper; the wing is longer than the tail, and pointed, the secondaries falling short of the primaries by more than the length of the metatarsus, while the feet are short and stout. These birds are found in North America generally, ranging throughout Central America to Colombia, Ecuador, and the Antilles. The common rose-breasted grosbeak (*Hedymeles virginianus*) is well known in the United States, where it is valued for its handsome plumage and charming song. Dr. Coues gives the following account of its habits:—"I have nowhere found this beautiful bird more abundant than along the Red River of the north, and there may be no locality where its nidification and breeding-habits can be studied to greater advantage. On entering the belt of noble timber that borders the river in June, we are sure

to be saluted with the rich, rolling song of the rose-breasted male; and, as we penetrate into the deeper recesses, pressing through the stubborn luxuriance of vegetation into the little shady glades that the bird loves so well, we may catch a glimpse of the shy and retiring female darting into concealment, disturbed by our approach. She is almost sure to be followed the next moment by her ardent spouse, solicitous for her safety, and bent on reassuring her by his



RED CARDINAL AND ROSE-BREASTED GROSBREAK ($\frac{2}{3}$ nat. size).

presence and caresses. Sometimes during this month, as we enter a grove of saplings, and glance carefully overhead, we may see the nest placed but a few feet from the ground in the fork of a limb. The female, alarmed, will flutter away stealthily, and we may not catch another glimpse of her nor of her mate, even though we hear them both anxiously consulting together at a little distance. The nest is not such an elegant affair as might be desired; it is in fact bulky and rude, if not actually slovenly. It is formed entirely of the long, slender tortuous stems of woody climbers and similar stout rootlets; the base and outer walls being very

loosely interlaced, the inner more compactly woven, with a tolerably firm brim of circularly disposed fibres. Sometimes there is a little horsehair lining, oftener not. The eggs are of a light and rather pale green colour, profusely speckled with dull reddish brown." The summer range of this grosbeak extends to Labrador. The general colour of the adult male is black above; the lower back and rump being pure white, slightly mottled with black tips; the wings black, with the secondaries tipped with white; the tail-feathers black, the three outer ones marked with white, on the inner web; the crown of the head, lores, the sides of the neck, and throat are black; the fore-neck and chest are beautified with a large patch of rose-colour, extending in a line down the centre of the breast; the breast and flanks are white, the thighs spotted with black; and the under wing-coverts rose-colour. This beautiful dress is only gradually assumed, three years being needed for the assumption of the perfect adult male plumage.

Red Cardinals. The red cardinals have the bill very large and stout, pointed, and conical; the wings very short and rounded, and the tail longer than the wings, and rounded; while a long crest is present. They offer an instance, not very common among birds, of a group in which the males are nearly all alike, so that the specific characters depend upon the females. There can, however, be no doubt about the differences in the latter; although the males differ from one another mainly in intensity of colour, and to a slight extent in sizes. The most brilliant forms appear to be those from tropical localities. These birds are found in the United States, ranging south into Mexico and British Honduras. One of the best known of North American birds is the common red cardinal, or Virginian nightingale (*Cardinalis virginianus*). Dr. Coues says that this cardinal inhabits by choice, thickets, tangle, and undergrowth of all kinds, whence issue its rich, rolling, whistling notes, while the performer, brightly clad as he is, often eludes observation by his shyness, vigilance, and activity. The nest, built loosely of bark-strips, twigs, leaves, and grasses, is placed in a bush-vine or low, thick tree; and in this the cardinal lays rather a peculiar egg, some specimens recalling those of a night-hawk's, in coloration at least, while others are more like those of the rose-breasted grosbeak in the pattern of markings. While the ground-colour was white in all of about fifty cases noticed, the spotting is of every shade of brown, from pale reddish to heavy chocolate: but it is usually rather dark, and there is a great show of the various purplish brown or stone-grey markings. The typical form of the Virginian nightingale ranges westward from the Eastern United States to Kansas, Nebraska, the Indian Territory, and Texas; where it may be either stationary or slightly migratory. A smaller form is found in Eastern Mexico, which is a deeper red, being of a rich rosy scarlet. The Californian form has a larger bill than the type, and is rather smaller in size; the black mask on the face not being continued across the forehead. From Western Mexico there comes a form similar to the last, but smaller, and of a much more rosy red, the crest feathers being elongated and stiffened. The adult male of the typical form is deep scarlet-vermilion, or rosy-red above, with the forehead, chin, and upper throat black; the wings dusky, externally rosy, and the under surface rich vermilion. The female is dull ochreous brown above: the long, crested feathers, wings, and tail being dull vermilion, and the under-parts buff, washed with vermilion.

THE TRUE FINCHES.

Subfamily *FRINGILLINÆ*.

The true finches are distinguished from the grosbeak group by their less powerful bills, and different cranial characters; and although their bills are variously modified to meet their manner of life, on the whole they possess many common characteristics. They are found principally in temperate climates.

The Chaffinches. Chaffinches possess a rather long and slender bill, conical in shape; and the wings are furnished with a first primary so small as to seem wanting, the rest of these feathers varying in their comparative length. The tail is moderately long and decidedly forked. These finches inhabit Europe generally, as well as Western Siberia, Persia, Turkestan, Madeira, and the Canaries and Azores.

Common Chaffinch. The common chaffinch (*Fringilla cœlebs*), is abundant in most parts of Europe, being in some districts even more plentiful than the house-sparrow. In the British Isles, as on the Continent, it is a general favourite, nesting in close proximity to dwelling-houses, and rearing its young almost under the windows. During the winter, chaffinches consort in large flocks, which break up at the close of the cold weather, when their familiar notes enliven groves and orchards with their melody. In early spring the chaffinch begins to pair, when the male birds are no longer tolerant of the society of their fellows, but exhibit a high degree of jealousy towards their rivals. Even in the middle of June we have seen cock-birds engaged in combat, although such contests usually precede the nesting-season. The chaffinch builds its nest in a fruit-tree or tall hedgerow; and we recollect one nest built on the trunk of a large tree, which looked as if it had been placed there by accident rather than by design, so exactly did its grey trimming harmonise with the colour of the bark. Mr. Gray remarks that the chaffinch "varies the structure of its nest according to the locality which it happens to frequent. In rural places, away from the dust and smoke prevailing near cities and large towns, the nest is a perfect model in its way for neatness and compactness of form; but in less favourable situations, where the building materials are not so fresh, it is slovenly and untidy. Any large series of nests gives ample proof of this, some being composed entirely of moss closely interwoven, others of lichens laced all over with spiders' webs, while those obtained in the outskirts of Glasgow are built of dirty straws, pieces of paper, and bits of blackened moss intermixed." Mr. Dresser describes a nest which he took in Finland as being of the most artistic structure. It was placed upon a birch-tree, and neatly ornamented with pieces of yellow and grey lichens and small bits of birch-bark, so as to resemble a portion of the tree itself; and was finally most carefully lined with soft moss and bits of down and wool, through which some fine roots showed every here and there. A remarkable nest found in Denmark was decorated all over the outside with small pieces of newspaper. The eggs of the chaffinch are generally purplish grey in ground-colour, washed with green, and blotched and spotted with dark red; but we have seen perfectly blue, unspotted eggs, although this variety is rare. The chaffinch feeds during the spring and summer months principally upon insects, and we have watched a male chaffinch gathering aphides from off the

under surface of the leaves of some beeches, clinging head downwards like a tomtit. A trait noticed in a village on the Rhine was that the chaffinches to a large extent deserted the shelter of the trees when singing, preferring at such times to occupy a more conspicuous position upon some cottage roof, or the gable of a barn. The chaffinch is to a large extent a bird of passage, moving from one part of the country to another, according to the supply of food and the condition of the weather. In the breeding-season isolated pairs of chaffinches may be found nesting in localities little adapted by natural circumstances to afford them a home, as, for example, when a pair of these birds elect to take up their summer quarters beside some northern farm where they have to perch upon the stone walls in default of timber; but the chaffinch is a bird of resource, and if hard pressed will even nest upon the ground. The young birds frequently associate together as early as the middle of July, the sexes then being hardly distinguishable. The chaffinch is a fairly early nester; and we have known the young to fly as early as the 19th of May even in the West Highlands, although they do not usually hatch before the last days of that month. On the Continent we have found the chaffinch plentiful on mountain-ranges of moderate elevation, as in Central France and the Black Forest. In Switzerland it is a common bird about the summer châteaux, descending into the plains before severe weather sets in. The chaffinch is subject to considerable variation of plumage; and some few years ago we saw an entirely yellow specimen, which was identified by the discovery of a tiny patch of pink feathers on the breast. We have also seen others of a uniform bright yellow, and others again of a very light cinnamon. The male in summer has the mantle, back, and scapulars, chestnut-brown, the wing-coverts white, or black tipped with white; the quills black margined with pale olive-yellow; the inner primaries white at the base, forming a speculum; the secondaries white at the base, forming a band with white tips to the grey coverts; forehead black, the crown slaty blue, the chin and breast pale vinous red, and the lower-parts vinous white. The female is ashy brown above washed with olive-yellow, the wings being conspicuously pied with white, and the lower-parts are ashy brown.

Teydean**Chaffinch.**

This chaffinch (*F. teydea*) is peculiar to Teneriffe, inhabiting the dreary heights of the Peak and surrounding plateaux. It frequents the pine-forests, feeding on the seeds of the pines, and breaking the cone with its powerful beak in order to get at its contents. The note of this bird is plaintive and often repeated, and bears some resemblance to that of the serin finch. A somewhat rare species, and only occurring on the lower grounds when driven by a heavy fall of snow from its usual haunts, this chaffinch is known to the goat-herds, tending their flocks in the highest parts of the mountain. The adult male has the entire upper-parts rich dark blue; the wings and tail black, edged with slate blue; and the under-parts blue, fading into dull white on the abdomen. In the female bird, the blue garb of the male is replaced by dull greyish brown.

Brambling.

The brambling (*F. montifringilla*) is one of the characteristic birds of the northern parts of the Old World, nesting in the forest-regions of the Arctic circles, whence it journeys to winter in Southern Europe, Persia, and even India. In Siberia, Dr. Radde states that "the brambling remains occasionally during the summer and breeds there. On the 16th May 1859 I found

it not far from Tunkinsk; and on the 14th July 1855 I met with a family of them a few versts above the village of Kotchirikowa, the young birds of which were fledged. The male then killed was in moult, the crown being almost featherless. Only a few visit the high steppes of Dauria in spring; thus, for instance, a male was shot in the hedge of the kitchen garden at Kulssutayefsk; on the other hand they were numerous during the autumn migration at the Tarei-Nor. On the 15th of August I saw only a few males, on the 16th only a female; and on the 26th large flocks, consisting of young birds of both sexes, arrived. On the 30th they increased in numbers and frequented the neighbourhood of the kitchen garden. Later, when the night frosts set in, they took refuge at night in



BRAMBLING.

the high reeds which grow round the ponds. Here they remained till the 11th of September; but then the large flocks were wanting, and I only saw stragglers up to the 15th of September." Usually the brambling lays a larger number of eggs than any other of the finches, seldom less than six and more generally seven; and when compelled to leave its nest to seek food, or for any other purpose, the bird is in the habit of covering its eggs, which are laid late in May or early in June. According to Mr. Collett the brambling generally builds in a birch or spruce close to the main stem, and about six or seven yards from the ground. The nest is con-

structed like that of the chaffinch, but generally more of moss. The eggs closely resemble those of the chaffinch; but in the latter the general colour is greyish brown, not greyish blue, and the spots are smaller. Gould states that all the nests which he observed were composed of green mosses and fine, dried grass, interwoven with cobwebs and externally decorated with flat pieces of white lichen and thin threads of birch bark. They were lined with fine wool and some feathers of the white grouse; but we have seen quite a variety of feathers in the nests of these birds, including those of the nutcracker. During the autumn considerable numbers of bramblings cross the North Sea to winter in the British Isles; their arrival being usually heralded by the reiteration of their harsh call-note. They frequent stubble-fields and farm-yards in common with chaffinches, greenfinches, and sparrows, but prefer to subsist upon beech-mast. The adult male in breeding-plumage has the general colour above blue-black, with generally a few sandy margins to the feathers; the lower back and rump being white, the wing-coverts orange-rufous, tipped with white; the wing-quills black, the primaries being edged with pale yellow, and the inner ones white at the base forming a speculum, the tail-feathers are black, with the outer pair broadly white for more than half the outer web; the crown and sides of the face are black; the throat and breast pale orange-rufous, and the flanks spotted with black.

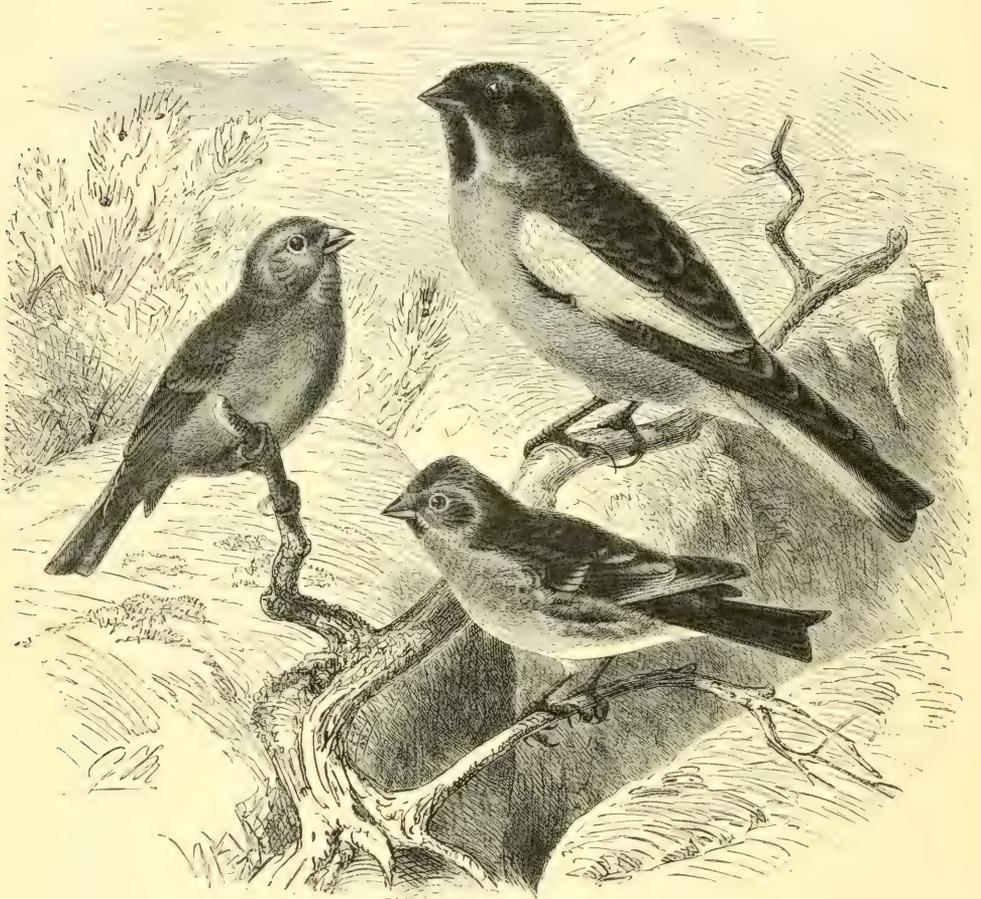
The Siskins. This group comprehends a number of small finches, characterised by the possession of a long and acute bill, long wings, and a short, deeply-forked tail; green and yellow predominating in their plumage. All are highly gregarious in habits. They belong to both the Old and New Worlds, having representatives in Abyssinia, the Himalaya, Siberia, the United States, and especially South America, where several species are found in Chili, Bolivia, Ecuador, and other parts of that continent.

American Siskin. One of the most charming birds of the United States is the yellow-bird or American siskin (*Chrysomitris tristis*), which is also common in many parts of Canada. It is a lively, graceful species, full of vivacity, and leads a social life, roving about in small communities. Even in the breeding-season these birds are partial to the company of their fellows, and fly in flocks between their nests and their favourite feeding-grounds, where they consume the seeds of various wild plants. The nest is small and compact, built of soft, downy substances. The eggs are white, with a rosy blush when fresh. After the breeding-season, the family parties unite permanently, and rove over the prairies in search of weedy places where they can find subsistence. The adult male in summer is bright golden yellow above and below; the crown and wings being black, the great coverts tipped with white; and the tail black spotted with white. In September the general plumage changes to pale flaxen brown above, and whitish brown below.

Common Siskin. From Japan to the British Isles the common siskin (*C. spinus*) is found in suitable localities, breeding chiefly in the northern part of its range. During the breeding-season the cock-birds are restless and lively, singing nearly all day, generally while on the wing, and sending their joyous call-notes ringing through the air. The nest is very like that of the goldfinch, although not so neat; the one example that has come under our notice having been placed in a fir-tree about twelve feet from the ground. Although only occasionally nesting in England, the siskin breeds regularly in Scotland; and it has been recorded as breeding in Ireland. In winter it frequents alder groves, living in flocks, and searching the catkins for their seeds; and we have also seen it feeding on thistle-heads and the seeds of wild grasses. It occasionally interpairs with the lesser redpoll and goldfinch in confinement. The general colour of the male siskin is yellowish green above, the rump being bright yellow; the quills are blackish, the primaries being edged with bright yellow; the tail-feathers are blackish, edged with yellow, and all but the central feathers yellow at the base; the chin is black, and the throat and breast are bright yellow.

Citril Finch. A less well-known member of the siskin group is the citril finch (*C. citrinella*), which is an inhabitant of the Tyrol, many parts of Switzerland, Greece, and other districts in the south of Europe. Avoiding the plains, this bird generally nests among pine-forests, as far as possible from human habitations. In the Jura, Mr. Scott Wilson states that after some search his party at length discovered a nest of this finch placed high up in a spruce-fir, at the extreme end of a branch. The *chasseur* climbed up, and brought down the nest with three eggs. This nest, which contained several feathers of the nutcracker, was cup-shaped, and constructed chiefly of dry grass stems, moss, and thistle-down,

woven together with fine roots and hair, lined with thistle-down and feathers. Another nest contained no feathers, being lined entirely with thistle-down. A third was lined entirely with hair, and very little thistle-down had been used in its construction." The eggs are greenish blue in ground-colour, speckled with reddish grey and blood-red. The citril finch is a favourite among continental bird fanciers, being easily tamed, and occasionally hybridising with other finches in captivity. Although it passes the summer among the mountain forests, it



CITRIL FINCH, SNOW-FINCH, AND LESSER REDPOLL ($\frac{1}{2}$ nat. size).

descends from the higher grounds during severe weather. It is valued as a cage-bird, principally because it possesses a loud, pleasant song, sometimes compared to that of the canary. The adult male in breeding-plumage has the general colour above dull olive-green, with dusky shaft-streaks to the feathers; the rump and upper tail-coverts being brighter yellow; the nape and sides of the throat are ashy grey; the wings and tail dusky brown, edged with ashy yellow; and the crown of the head, as well as the feathers round the eye, the fore-part of the cheeks, and the throat and chest olive-yellow.

Linnets. The linnets have a hard and conical bill, a somewhat pointed wing, the tail rather long and forked, the metatarsus short, and the toes stout. They are also characterised by the possession of a nearly uniform brown or whitish brown plumage, generally associated to some small extent with pale crimson. Chiefly found in the northern parts of the Old World, they are also represented in the Arctic portions of North America.

Common Linnet. The common linnet (*Linaria cannabina*) inhabits most parts of Europe, being generally common from Spain eastwards to Central Asia, although assuming brighter plumage in Turkestan and other distant parts of its range. The linnet in England frequents commons covered with gorse, in which its nest is often placed; but sometimes it nests in a hedge or small tree. Generally an early breeder, we have seen the young in the nest as late as the month of August. It builds a loose, untidy nest of fine twigs and fibres lined with hair, wool, and sometimes a few feathers, in which it lays from four to six eggs of a greenish-white ground-colour, blotched with red. After the breeding-season linnets range through the fields in vast flocks, often composed of one sex almost exclusively. As autumn advances, many of the linnets that have been bred in the English woodlands cross the sea to other countries; while others again join company with bands of greenfinches in search of food. The linnet is frequently white or pied, but the most beautiful variety is of a cinnamon-brown which harmonises with the rose-coloured breast. The male linnet is warm reddish brown above; the forehead, fore-neck, and chest, being crimson; and the breast and under-parts dull buffy white.

Lesser Redpoll. By some ornithologists the lesser redpoll (*L. rufescens*) is regarded as a variety of the mealy redpoll of Northern Europe, the former bird being chiefly confined as a breeding species to the British Isles and certain parts of the Alps, though it has also nested on the island of Heligoland. The lesser redpoll is an early breeder, selecting a variety of trees to contain its nest, including alder, hazel, crab, birch, willow, and walnut; as many as five nests having been seen at once in a single hawthorn hedge. The height from the ground at which the nest is placed varies from four to twenty feet; and the composition of the nest also varies, the exterior generally consisting of moss and dried grass, with a lining of beautiful down from the catkin of the willow: but we have seen nests composed of dead fir twigs, and others built of hawthorn stems. The nest is often lined with fine grass and hairs, together with a few feathers; but one was composed exclusively of cotton-waste.

Much less liable to exhibit white or pied phases of plumage than the linnet, the lesser redpoll is occasionally of a nearly uniform cinnamon-brown. In captivity it interbreeds with the canary, but the offspring of this cross are small and insignificant brown birds, devoid of the fine musical powers which most canary males possess. The typical redpoll is light brown above, with dark centres to the feathers; the forehead being dark crimson, while the throat and breast are suffused with rosy pink, especially in the breeding-season. The small insular form of redpoll, which for many years was supposed to breed only in Great Britain, differs from the former bird in being smaller and of a more reddish colour. The sexes are generally alike, but the female does not assume the rosy tint upon the breast.

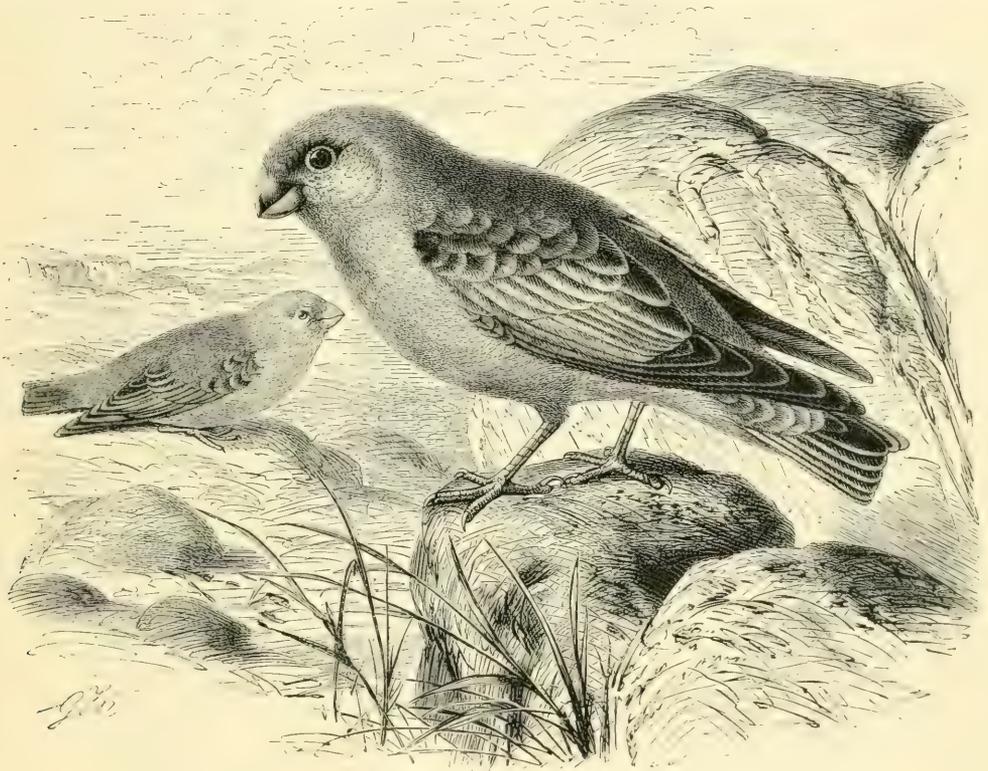
Snow-Finches. The snow-finches form a small group possessing the characteristic form of the true finches, but with the long wings falling short of the tail by less than the length of the metatarsus. Chocolate or reddish brown appears to predominate in the plumage of this group, often associated with rose-colour, but the type of the genus is conspicuously pied with white. Snow-finches are chiefly found in the mountains of Central Asia, but some species range over the northern parts of Siberia, Japan, and Northern China. The best known is the common snow-finch, of the mountains of Southern Europe, and ranging eastwards to Palestine, but replaced in Persia, Turkestan, and Afghanistan by the eastern snow-finch.

Common Snow-Finch. The common snow-finch (*Montifringilla nivalis*) breeds in the highest regions of the mountain ranges of Central Europe, adapting its habits to the desolate regions in which it passes the summer; and we owe to Mr. Scott Wilson the following account of its habits. "It was observed at a greater height than any other Alpine bird. At the foot of the Lammern glacier, seven thousand six hundred feet, we found it breeding at the summit of the Furka Pass, as well as at the Gemmi. It lays about the end of May or the beginning of June, at a time when the ground in these Alpine regions is entirely covered with snow: from which cause I suppose it is obliged to place its nest under the roofs of buildings, or, where there are no buildings, in rocks which do not hold the snow, the former not only affording them a dry nesting-place, but one which also protects the nest from the storms of snow and sleet, which have by no means ceased to fall by the end of May. A nest obtained on the Furka is principally made of dry grass-stalks, intermingled with which are tufts of hair, wool, leaves, shavings of wood, and a few feathers. The inside walls are lined with ptarmigan's feathers, both white and brown, these being woven together very compactly with horsehair, and in a nest before me also with strands of green worsted. The bottom of the nest is not lined with feathers. The outside diameter, which is nearly round, is $8\frac{1}{4}$ inches; the inside diameter $3\frac{1}{2}$ inches; thus the inside cup is small in proportion. The eggs are pure white, and from three to five in number." Mr. Wilson adds that the snow-finches in winter descend from the Alpine regions to the lower valleys. The snow-finch is a beautiful bird, rather larger than the greenfinch or sparrow, with long wings, in which the primary quill-feathers are much longer than the rest, as in some other birds of airy and graceful flight. The strong contrast of jet-black and purest white in the plumage, notably in the tail, which has two black feathers in the middle, while the rest are as white as snow, makes the bird conspicuous at a long distance, and a more striking object than the browner snow-bunting, which occasionally strays from the north to the Alps. There are few more beautiful sights than the wheelings and whirlings of a flock of snow-finches, with their white feathers glistening in the sun one moment, while the next their black ones will show clear against the snow. The adult snow-finch has the upper-parts brown, with light edgings to the feathers; the hind-neck and sides of the neck are ashy grey: the wings and tail are black and white, some of the feathers being edged with brown; while the lower-parts are white throughout.

Desert-Finches. This group has been founded to contain the palest forms of the rose-finches, the only two species known being inhabitants of desert

countries. The bill is short and much arched, with both mandibles much curved. The wings are very long, reaching within a third of an inch of the end of the tail, when closed, and the metatarsus is comparatively long. The plumage of both sexes in this genus is grey or brown, suffused with pink. The desert-finch (*Erythrospiza githaginea*), the western representative of the genus, is found in the Canaries, the Sahara, and Egypt, extending eastwards through Afghanistan and Baluchistan to the Punjab, while the Mongolian desert-finch (*E. mongolica*) inhabits the deserts of Central Asia, extending its range eastwards into Western China.

The common desert-finch is an inhabitant of the most sterile regions. Its habits in the Canaries have been described by Dr. Bolle, who writes that "it is always



DESERT-FINCH ($\frac{2}{3}$ nat. size).

found in sociable little groups, when the cares of the breeding-season do not keep it solitary. The cheerful little bird dances from stone to stone, or glides about near the ground; but seldom can our sight follow it far into the landscape, for the reddish-grey feathers of the old bird mix closely with the colours of the stones and leafless stems and twigs of euphorbia, as the buff of the young does with the pale yellow of the sand or chalk. We should lose it if its voice, which is one of its most striking peculiarities, did not guide us to it. Listen! A note like that of a small trumpet trembles through the air and vibrates continuously; and if we are very attentive, we shall hear, just before and just after it, two gentle, light notes,

ringing like silver bells through the still desert, or the almost imperceptible chords of an harmonium played by unseen hands. Again it changes, and this time its notes resemble the deep croak of the green frog of the Canaries, but less coarse, hastily repeated one after another. . . . The desert-finch does not appear frequently on the steep, rocky hills. . . . It is much more partial to the black lava-streams of the desert, which, full of gaping rents and chasms, hardly permits a blade of grass to become green. They feed entirely or almost so on the seeds either of grasses, which are found like a mealy kind of bread in their stomachs when killed, or the oily seeds of composite and cruciferous plants, which they shell, like other finches, by moving them most carefully backwards and forwards between the mandibles of their strong beaks." This bird will also eat tender young leaves, Mr. Hume having observed it in Sind feeding in desert places in patches of mustard and other cultivation. It cannot long dispense with water, and must often fly some miles daily to get it; and the presence of these finches in the desert is always a good omen for the thirsty traveller. "I have constantly seen them," continues our author, "fly to drink in flocks. They drink much at a time in long draughts, between which they lift up their heads. After drinking they are very fond of bathing. I have never seen them roll about in the dust like sparrows. The breeding-time begins in March, and like those of most true desert-birds the nest is well concealed, and with such foresight that it can hardly ever be found. . . . I know, however, from the goat-herds of Fuertaventura, that the moras, as they are called there, build in crevices under large overhanging stones upon the ground. The nest has a tolerably strong texture, and is woven with the coarse straws of the desert-grass and lined within with great feathers, mostly of the ostrich and bustard, as well as the wool of the camel and hair of the goat. The number of eggs is from three to five. . . . They are rather large for the bird, pale sea-green, or lighter, with small spots and points of reddish brown. These finches certainly breed twice, if not more frequently. The second moult takes place in July." The desert-finch occasionally strays from its southern home into the Mediterranean region. The adult male in the breeding-season has the upper plumage, including the crown, ashy grey; the forehead, cheeks, rump, and all the lower plumage of a beautiful rose-pink; and the wings and tail brown, edged with rose-pink. The female is similar, but with all her tints duller.

Rock-Sparrows. The members of this group resemble the typical sparrows in structure and habits, but differ in having a much stronger bill and longer wings. Unlike the true sparrows, the female rock-sparrows have however, no distinctive plumage of their own, but resemble more or less closely the male birds of their own species. The rock-sparrows are found in Southern Europe, extending into Central Europe, and ranging eastwards into Central Asia and Siberia, as well as Northern China. One species is found in India as a winter visitor, while two are resident in Africa.

The European rock-sparrow (*Petronia stulta*) is found in some districts of Spain and Portugal, and the South of France, as well as in Greece and Palestine. Its habits resemble those of the common sparrow; but it is generally a very shy bird, flying away on the approach of danger, and constantly keeping a good lookout. It nests in the ruins of old castles and crevices of the rocks, building a

large, untidy nest, composed of stems of grass and plant fibres, lined with hair, feathers, and other materials. It lays two or three eggs in a clutch, white in ground-colour, streaked and spotted with ash-grey and brown. The parents wait assiduously upon the young, and manifest the greatest distress if the safety of their progeny be endangered. In autumn they gather into flocks, and some migrate from their higher breeding-grounds. The flight of this bird is rapid



ROCK-SPARROW, SPANISH SPARROW, TREE-SPARROW, AND HOUSE-SPARROW ($\frac{1}{2}$ nat. size).

and well sustained; and the usual note a harsh chirrup. Although partial to fruit, the rock-sparrow feeds principally upon insects during the summer months, visiting the stubble-fields in autumn. Upon the approach of winter, rock-sparrows often consort with other small birds, in the company of which they frequent the roads and even villages. The general colour of the male is brown above; the mantle and back being broadly streaked with black, and having a whitish brown spot at the tip of the outer webs of the feathers; while the crown

is light brown in the centre, bordered with dark brown, and followed by a broad whitish brown eyebrow; the wings and tail are blackish brown; the cheeks, throat, and under surfaces pale ashy brown; and the lower throat varied with a patch of pale yellow.

True Sparrows. The genus *Passer* contains the true sparrows, which are represented over the greater part of the Old World; and, as restricted by Mr. Oates, are characterised by both sexes exhibiting a peculiar pattern upon the outer webs of the first primaries. The bill is stout and short, and the abbreviated wings fall short of the tail by more than the length of the metatarsus. Originally absent from the New World, the true sparrows have been introduced into the United States, where they have become a serious pest, their injurious character becoming more and more appreciated as the species spreads; they are indigenous to the greater part of the Old World, excepting Australia and the Moluccan Islands.

House-Sparrow. The house-sparrow (*P. domesticus*), which nests only too numerous in many country districts, is essentially a dweller among men. With the members of its earlier brood ready to leave the nest in May, it produces many broods in the season, sometimes evicting the house-martin from its mud-plastered home, though occasionally the troublesome intruder is walled up by the irate martins. The eggs of the house-sparrow are greenish white in ground-colour, blotched or spotted with ashy grey and dusky brown. When the young are hatched, the old birds redouble their diligence in procuring food. It is generally supposed that sparrows feed largely upon insects, and there is no doubt that in many districts this is the case for a considerable part of the year. In autumn these birds band together in flocks, and, leaving their haunts in street and alley, join their country brethren in anticipating the farmer's harvest. Few persons but practical men are at all aware of the vast injury annually inflicted upon the farming community by the hordes of sparrows which ravage the corn-fields. Nor is their mischief limited to assailing standing crops of grain. On the contrary, they inflict considerable injury upon gardeners by picking up freshly-sown seeds of every kind. They destroy green peas quite as effectually as the hawfinch, and are in many other respects most undesirable neighbours. In America the influence of the house-sparrow has already proved disastrous to many of the indigenous birds, which have been driven from their proper haunts by the intruder. Even in remote districts of the Highlands of Scotland, the sparrow is gaining ground every year, and taking the place of more welcome guests. The sparrow builds a cumbrous nest of straw, hay, dry grass, rags, or any other material that comes handy; the nest being often placed in a waterspout, a chink of a wall, the thatch of a barn, or the frieze of a building. Occasionally it is placed in an open tree or hedgerow, but the nest is then domed as a protection against the weather; and it is almost always profusely lined with feathers. Taking great pains to maintain its plumage in good condition, the sparrow not only indulges in frequent baths, like most of the finch tribe, but in summer shows a partiality for dusting its feathers in lark fashion. Sparrows exhibit some pretty variations of plumage; all the birds in a brood being occasionally spotted with white, or at any rate cream-coloured; male birds in particular being frequently variegated

with white, which most affects the quill-feathers. The adult cock in summer has the plumage of the upper-parts chestnut, streaked with black on the mantle and back; the primaries being blackish, edged with pale rufous; the median coverts black, tipped with white, forming a wing-bar; the tail-feathers dusky brown; the crown of the head and nape ashy grey; a broad streak of chestnut extending downwards from the upper-parts of the eye; the cheeks ashy white; the throat and fore-neck black; the sides of the breast brownish ash; and the under-parts white. The female is a dull brown bird, lacking the black gorget of the other sex.

Tree-Sparrow. The haunts of the tree-sparrow (*P. montanus*) are more remote from human dwellings than are those of its congener the house-sparrow. Sometimes, it is true, a pair or two of tree-sparrows may take up their abode in some old wall beside a cottage or farmhouse; but trees are their favourite resorts. Not unfrequently the tree-sparrows build under old nests of rooks; the nest being not so bulky or untidy as that of the house-sparrow. The eggs are bluish white in ground-colour, blotched and spotted or suffused with hair-brown. Sometimes tree-sparrows nest in the crevices of a chalk cliff; and a colony has been found established under the iron girder of a railway bridge. The movements of the tree-sparrow are more graceful than those of the common bird, from which it can also be distinguished by its more musical and shriller chirp; while, unlike the house-sparrow, the tree-sparrow possesses a short but pleasing song. Far more shy than the house-sparrow, the tree-sparrow, instead of courting observation, shuns publicity; and its flight is more rapid than that of its cousin. On one or two occasions we have seen the two species consorting together; and we have observed the tree-sparrows flying with flocks of greenfinches during the autumn migration. The majority of those we have seen in confinement seemed too wild to give their confidence readily to any human being; but a male of this species, caught in the month of February, lost its dread of man in a very few weeks, and sang freely in a cage. Although, as already said, the house-sparrow is so subject to variations of plumage, we never yet met with a white or pied specimen of the tree-sparrow. The adult is fawn-coloured above, the feathers of the mantle having ashy edgings and broad black streaks; while the lesser wing-coverts are uniform chestnut; the medium wing-coverts black, with broad white tips forming a wing-bar; the chin black; the cheeks white, spotted with black; and the under-parts ashy.

Spanish Sparrow. The Spanish sparrow (*P. hispaniolensis*) replaces the English bird in many parts of the Mediterranean region, including Sardinia, Corsica, Sicily, and Malta, nesting in the walls of houses and the crevices of rocks. It is abundant in Algeria, especially amongst the reeds in the salt-marshes; and Mr. O. Salvin gives the following notes upon its habits in the Atlas, observing that it "is found in great numbers during the breeding-season among the tamarisk thickets on the Chemoria and in the high sedge at Zana. The Arabs destroy the eggs, nest, and young wherever they find them, as their great numbers do much damage to the crops of corn. The nests are placed as thickly as they can stand, the whole colony, consisting of perhaps one hundred pairs, occupying only five or six trees. The noise and ceaseless chattering proceeding from one of these sparrow-towns can easily be imagined; and, guided by the sound alone, one may walk directly to the spot for a considerable distance. One Sunday morning four

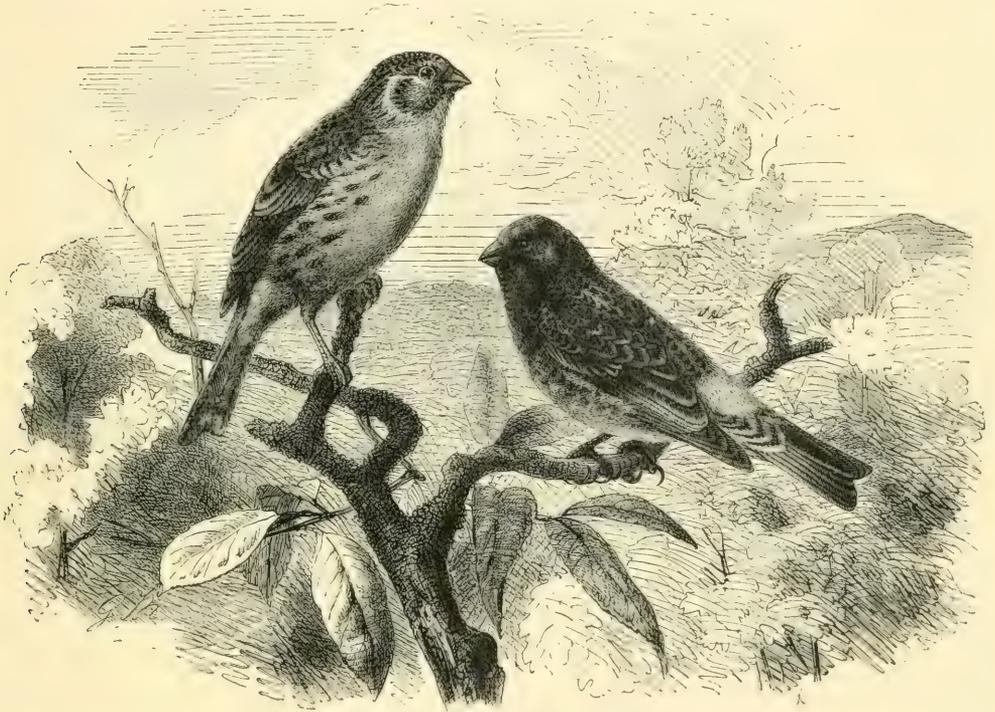
Arabs came to our tent, and, gravely sitting down in a row, opened the hoods of their burnouses and displayed eight hundred or a thousand sparrow eggs, which they arranged in four heaps before them, and remained in their sitting posture contemplating them with evident satisfaction. We were rather taken by surprise, but reserved the best for our collections, leaving the rest for omelettes." The egg of the Spanish sparrow is somewhat smaller than that of the house-sparrow, white in ground-colour, blotched and streaked with dark grey. The male has the crown and nape dark chestnut; the back black, streaked with cream-colour; the cheeks and eye-stripe pure white; the lesser wing-coverts chestnut, tipped with white; and the throat and upper breast deep black. The female is dull brown.

Cape Sparrow. A well-known bird in many parts of South Africa is the Cape sparrow (*P. diffusus*), which takes up its abode near dwelling-houses, and reproduces exactly the habits of the European house-sparrow. In some districts the Cape sparrows build their nests in low, thorny bushes; but they are equally partial to holes in walls and the eaves of thatched roofs. The nest is a large structure loosely put together, consisting of sticks, straws, and feathers lined with wool; the eggs being light green in ground-colour, blotched with brown. Having all the pert ways of its European relative, the Cape sparrow is partial to corn, but also consumes many insects. The adult male has the crown, throat, and breast black; the back of the head and neck brown; the back and rump rufous; a white eye-stripe running backwards from above the eye; the wings and tail brown; and the lower-parts dirty white.

Serin Finches. The type of this small group of little finches possesses a short, hard, conical bill, with the upper mandible slightly exceeding the lower; the wings being moderate in length and the tail rather deeply forked. The metatarsus is slender, and scutellate in front, while the toes are small. Yellow usually predominates in the plumage of the serins; the females generally having the flanks much striated with dark brown. Of the nineteen species of serins, sixteen are peculiar to Africa; and of these the greater number are found in the southern portions of that continent.

The serin finch, which forms the type, ranges through Central and Southern Europe to Asia Minor, Palestine, and Egypt; Tristram's serin inhabits Palestine; while the red-fronted serin is found in the Caucasus and Turkestan. The true serin finch (*Serinus hortulanus*) is partial to orchards and gardens, and is a bright vivacious bird, often to be seen upon the wing, indulging in irregular flights, trilling all the time. Wintering in the southern quarters of that continent and in North Africa, it is a summer visitor to Central Europe. Its nest is a neat structure, generally placed at the extremity of a bough, composed of vegetable fibres, moss, and fine stems, lined with feathers and sometimes a little horsehair. Generally preferring fruit-trees to the beech, oak, or alder, we have seen it nesting in fir-trees in walled gardens. Mr. Dresser gives the following account of its breeding-habits, observing that "the serin finch inhabits the foot of the mountains skirting the plains, but does not appear to affect the plains themselves; nor is it found in the mountains, being there replaced by the citril finch. It is usually to be met with in the orchards and gardens and in the vineyards, frequently in gardens which are surrounded by houses, in which last

locality it is tolerably tame,—though, so far as my own experience goes, it is very shy and difficult of approach. During the fortnight I spent at Staufen, I never got within range of one outside the town, though on several occasions I saw and heard it. In the town itself I several times saw specimens; but as they doubtless had nests in the neighbourhood, and as, besides, it would not well do to shoot in the town, I did not obtain a specimen. It may easily be recognised by its call-note and flight. The former somewhat resembles that of the canary, but may easily be distinguished by anyone who has heard it. Its song is poor, and lacks both depth and melody, being merely a continuous twittering warble, generally uttered, it would seem, as the bird is seated on the topmost spray of some tree, usually a fruit-



SERIN AND RED-FRONTED FINCHES ($\frac{1}{2}$ nat. size).

tree. Its flight is exceedingly swift, and may not inaptly be compared to that of a sand-martin, which it far more nearly resembles than that of any other finch. It sometimes sings whilst on the wing; that is, it will fly up from the spray on which it has been seated like a tree-pipit, and will continue its song during the short time it is in the air. It feeds chiefly on seeds of various kinds—at least, all those I have at different times shot, and the contents of whose stomachs I examined, had been feeding on these alone—grass-seeds and those of the various wild plants and weeds, chiefly such as are oily: and it appears always to shell the seeds and discard the husks before swallowing them. It seeks after food in fields, gardens, and especially in the vineyards, in which last it is usually to be found. The nest is a very neat, compact, little structure, very carefully made, and neatly shaped. It is built of fine roots and grass-bents, and neatly lined with feathers and horsehair. The

outer portion of the nest appears to be interwoven with spiders' webs; and a few bits of lichen and grey moss are affixed here and there. A nest in the possession of Mr. Carl Sachse, taken near Frankfort, is built in the fork between three upright small branches of a lilac tree, and is constructed entirely of fine grass-stems and rootlets, intermixed with cotton and woollen threads. These latter are utilised more especially to bind the structure to the branches, which is most effectually and strongly done, one of the branches being encircled at least a dozen times with a long piece of tolerably stout, woollen thread. The lining consists merely of somewhat finer grass stems than those used in the construction of the exterior portion." The eggs vary from four to five in number, and are blotched with dark reddish brown. When migrating in the north of Spain, these birds do not seem to travel in large flocks, but rather in small parties, sometimes even singly, though the



THE CANARY ($\frac{2}{3}$ nat. size).

latter were presumably only stragglers from the main detachment of the migrating host. The serin finch bulks considerably amongst the small birds netted in the environs of Paris; and occasionally it even straggles to the south coast of Great Britain, where it has been taken on the southern shores on a good many occasions, especially in the neighbourhood of Brighton; its visits to Britain generally taking place in the spring of the year. The plumage of the male serin finch is pale brown above, with dark centres to the feathers; the forehead and nape being yellow; the lower back and rump bright yellow; the cheeks ashy grey; the quills blackish or dusky brown, edged with yellow; the throat and breast yellow; and the sides of the body and flanks ashy brown, washed with yellow and streaked with black.

Canary.

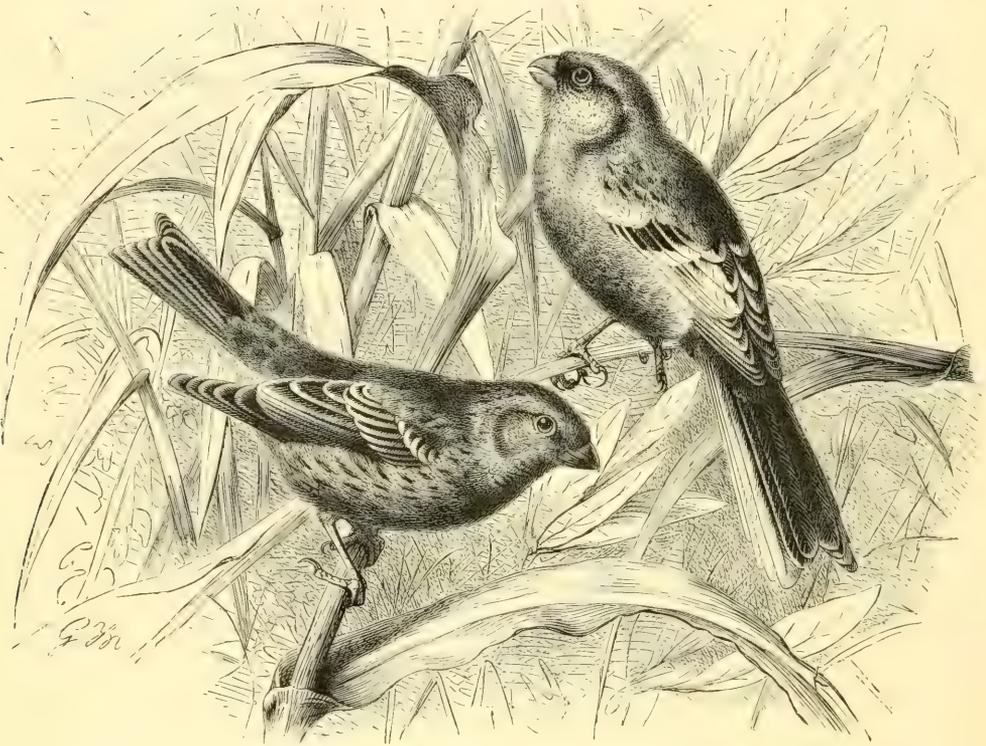
Found in most of the islands from which it takes its name, in Las Palmas the canary (*S. canarius*) is wonderfully abundant, and may be seen in great flocks throughout the breeding-season, as if there was not room for all to

pair and breed. In Teneriffe, it commences breeding near the coast in January, while in the high mountains it nests in June and July, ascending to its elevated haunts in the end of May; the nest being generally placed in an evergreen tree or shrub. The eggs are bluish green in ground-colour, and spotted with reddish brown. The song of the wild male is sweet and powerful, but does not possess the variety of notes heard from cage-birds. The wild canary has occasionally reached the southern shores of Great Britain as a storm-driven wanderer. The male has the upper-parts ashy brown washed with yellow, and streaked with blackish brown; the forehead, rump, and lower-parts being yellow; and the sides ashy streaked with black.

Rose-Finches. The brightly dressed finches of this group have the bill of proportionately smaller dimensions than the pine grosbeak, to which they are nearly related. The sides of the bills are convex, and the culmen moderately curved; the wings are long and pointed; the tail is much shorter than the wings, and considerably forked; while the feet are small and weak. The males are remarkable for their crimson plumage; the females and young males being plain coloured. Rose-finches are found in North-Eastern and Eastern Asia, Asia Minor, Palestine, the Indian region, and China, one species breeding as far west as Pomerania; and although the vast majority belong to the Old World, four species are peculiar to North America, one of which closely resembles an Old World form.

Scarlet Grosbeak. A common bird in the North of Europe is the scarlet grosbeak or rose-finch (*Carpodacus erythrinus*), regarding which Dr. Taczanowski, after mentioning that they only come to Poland to breed, observes that "they first appear generally about the 15th of May; and after a few days they are found at their regular nesting-places. They arrive singly, and take up their habitation in the bushes near water in the middle of fields and marshes; nowhere numerous, they are generally rather rare. The males announce their arrival by a characteristic song which is easily recognised even at a great distance. They are very restless, whereas the female on the other hand is quiet. When singing, the male generally perches on top of a tree or bush, always in full view, and during the short intervals of the song utters a deep, clear whistle which may be rendered as follows—*tiu tiu fi tiu, tiu, tiu fi tiu tiu*; after having repeated this about ten times, it descends amongst the branches and searches after food. While thus engaged it sometimes warbles in a very low tone. After about a quarter of an hour of repose it reappears in full view and recommences its song. In singing, it raises the feathers of its crown and throat, and in the sun looks much more beautiful than it really is. The food consists chiefly of the various seeds of trees and bushes, tender buds, etc. They seldom feed on seeds of plants, but sometimes they resort to the fields to pick up hemp-seed. They are not often seen on the ground, and only go there in search of materials for their nest. The latter is placed on small bushes generally on thorns, wild rose-trees, hawthorns, and among hops. In form it resembles that of *Sylvia cinerea*, and is constructed of fine, elastic, dry bents, particularly of ranunculus and hop, clover, and umbelliferous plants. The interior is formed of delicate, dry roots and shoots of plants, often interlaced with a few horsehairs or other coarse hairs. The nest is loosely constructed and the exterior almost carelessly, but it is regular and neat in the inside and in form is almost semicircular. It is placed in a fork of the

bush without being fastened to the branches, and is always well hidden in the foliage. . . . The general complement of eggs is five, rarely four or six. They are slightly elongated, slender, oval, or sometimes almost pyriform. In colour they are of a beautiful blue-green, almost like the eggs of the song-thrush, and are marked with spots of reddish black, more numerous at the larger end and but few on the rest of the surface. . . . In general character they resemble those of the common bullfinch, but are less in size, and the ground-colour is more intense and pure, while at the same time the spots are deeper. During the period of incubation, and when the young are still small, the male sings continually, but in different places and often far off, but it frequently returns to the vicinity of the



SCARLET AND SIBERIAN GROSBEAKS ($\frac{1}{2}$ nat. size).

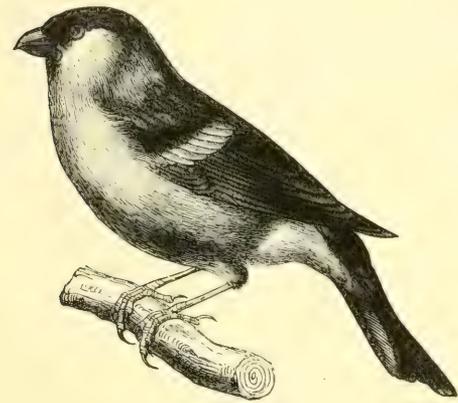
nest. When any person approaches, it calls exactly like a canary, and the female uses the same alarm-note. As soon as the young commence to be feathered, the male ceases his song and becomes as shy as the female. When they leave the nest, the whole family conceal themselves in the foliage, and it is very difficult to get sight of them, and they remain thus until they leave. Owing to their shy habits then, I cannot say when they do leave, but suppose it is as soon as the young birds can travel. In Siberia they are common, and remain longer there than they do here. They nest there upon young conifers." Mr. Seebohm, who appears to be one of the few British ornithologists who have studied the habits of the rose-finch in Northern Europe, states that "its song is a very striking one, and not to be confused with that of any other bird. It is a loud clear whistle,

'*tū-whit' tū-tū-ī.*' Although never varied, the song is sometimes repeated twice in rapid succession, and when it is heard, the bird may usually be seen perched conspicuously on the top of a bush or low tree. The marshy forest-banks of the great Siberian rivers are a favourite resort of this bird; and in the Baltic provinces, where it is common, and in the valley of the upper Volga it is described as frequenting willows and other low trees in marshy districts." In winter the scarlet rose-finch ranges over the plains of India, sometimes in large flocks, but more generally in small parties, frequenting alike groves, gardens, and jungles; at this season of the year its habits much resembling those of the true finches. In Gilgit it breeds at an elevation of ten thousand feet above the sea, fresh eggs having been obtained there in the second half of July. Early in September it leaves the hills and comes down into the valley, soon after migrating to winter quarters. In Central and Western Europe the scarlet grosbeak is only known as a rare straggler, generally on an autumnal migration, and as such, it has occurred in the British Isles. The general colour of the adult male is dark brown above, washed with rosy or pale crimson; the wings and tail are dark brown; the lower back and rump dull rosy; the crown of the head dull crimson, extending to the hind-neck; the cheeks, throat and breast bright crimson: the centre of the breast and under-parts dull white, slightly washed with crimson; Indian specimens as a rule being much more brilliant than those obtained in Northern Europe. The female lacks the bright colours of the other sex, being of an olive-brown above, with the lower back and rump olive-brown; the wing-coverts dark brown, edged with olive and tipped with yellowish white, forming a double wing-bar; the wing-quills and tail dark brown, edged with olive; the throat dull white streaked with brown; the fore-neck and breast ochreous buff with distinct dusky centres to the feathers; the under-parts white; and the sides of the body and flanks brown with dusky stripes. Mr. Seebohm states that males in the first winter plumage are scarcely distinguishable from adult females, and even in summer plumage are sometimes indistinguishable from them.

Bullfinches. The bullfinches can generally be recognised by their large head, short, swollen beak, and abbreviated wings, the tail being either square or slightly forked. Their pattern of plumage assists identification, since both sexes unite the characters of a white rump, together with deep black wings and tail. The common bullfinch (*Pyrrhula rubicilla*) inhabits the woods and thickets of Northern Europe and Siberia, giving place in Central and Southern Europe, as well as in the British Isles, to a similar form, identical in the arrangement of colours, but of duller tints and inferior size. The Azores possess a peculiar species of bullfinch, which has almost entirely lost the bright colours adorning the males of the other members of the genus; and another plain-coloured species is the brown bullfinch of the Himalaya, whose range apparently overlaps that of yet another Himalayan species, the red-headed bullfinch. The orange bullfinch is found in Kashmir and the adjoining territories. During the summer the habits of the common bullfinch are shy and retiring, but in the spring this bird appears commonly in gardens, where it commits serious ravages upon the buds of fruit-trees. Mr. Seebohm observes that there can be little doubt that bullfinches pair for life; and it may be considered certain that these birds are of an affectionate disposition, the cock being rarely absent

from its mate at any time of the year. Generally commencing to build about the middle of May in ordinary seasons, the bullfinch may lay a full clutch of eggs as early as the middle of April; and the nest is generally placed in a low tree or bush, seldom at a greater height than five feet from the ground. Composed of slender twigs, it is flat and shallow, but firmly woven together, and lined with root-fibres; the eggs varying from four to six in number, and being greenish blue in ground-colour, speckled and spotted with purplish grey, and dark purplish markings. Two or even three broods of young are sometimes reared in a season, in all of which the male sex largely predominates; indeed, there are cases where all the young in a brood have been of this sex. When the young leave the nest, they live with their parents in family parties, searching the hedgerows for the berries of privet and other wild shrubs. In the breeding-season the cock bullfinch is a pugnacious bird, always ready to do battle with any intruder who may venture into his territory. The

bullfinch does not appear to be migratory to any large extent, although it wanders considerable distances when pressed by hunger. In England it is seldom that more than nine or ten are seen in a flock, but in Southern Sweden the large form wanders about in big droves, sometimes composed exclusively of the male sex. Generally feeding almost entirely on wild seeds, fruit-buds, and berries, in severe weather the bullfinch devours the seeds of the common plantain. The flight of the bullfinch is generally low and undulating; but at times these birds may be seen flying at a considerable elevation, and



THE BULLFINCH.

alighting on the tops of the tallest forest trees. The natural song is feeble and without pretension; not that this species is devoid of musical taste, for the young males, if untrained, essay to sing their natural notes as soon as they are about four weeks old, but rather that the bird stands in need of a tutor, by whose patience its capacity for reproducing a lively air may be turned to practical account. The Germans bestow great pains upon the teaching of their tiny pupils, and are content to turn out only a limited number of really accomplished birds. The call-note is low and plaintive, and one of the most familiar of the varied sounds that from time to time break the silence of English woodlands. The plumage is subject to considerable variation, even in a wild state; one of the most remarkable varieties being creamy-dun colour, contrasting strongly with the jetty black crown, wings, and tail. The cock-bird sometimes combines a rosy breast with upper-parts of snowy whiteness. Typically the adult male is bluish grey above; the crown, wings, and tail, being glossy black; the rump white, and conspicuous when the bird is seen upon the wing; and the lower-parts pale vermilion, varying much in intensity. The female's breast is chocolate-brown.

The Pine-
Grosbeak.

Included by some writers among the bullfinches, but by others referred to a distinct genus, the pine-grosbeak (*Pinicola enucleator*),

is an inhabitant of the pine-woods of the northern regions of both the Eastern and Western Hemispheres. A gorgeously-coloured bird in its adult plumage, the pine-grosbeak seems to be remarkable for the variation in the time of the assumption of this dress; there being little doubt that cock-birds have bred while in their immature plumage. The wings are of moderate length; the tail being of medium length, and distinctly forked; while the feet are small, and the metatarsus does not exceed the third toe in length. The sexes are easily distinguished by the crimson red plumage of the adult male, although immature cocks cannot thus be distinguished. Mr. Seebohm remarks that the summer home of the pine-grosbeak is in a very picturesque country. "Almost all the forest districts of Siberia are hilly, and in the north, as the trees become smaller, they are also more thinly scattered over the ground, and the interminable extent of wood is broken by occasional flat, open marshes, which become gay with flowers as soon as the snow melts. The scenery is more park-like than farther south, and birds are much more plentiful and more easily seen. The pine-grosbeaks arrive at their breeding-grounds in small flocks in April, and continue to be gregarious until summer comes, when they disperse for the purpose of building their nests. They appear to be somewhat shy and retiring birds, because they do not frequent the roads like the bullfinches, the snow-buntings, and the mealy redpolls. But this is by no means the case; they confine themselves principally to the woods where they are not difficult to approach, even when the sportsman is obliged to hunt them in snow-shoes, six feet long, to support his weight upon the untrodden surface. In the large pine-forests they prefer the banks of the rivers or the outskirts of some open place, and may often escape detection from the habit of frequenting the tops of the trees. Within the Arctic Circle many of the trees are small, and on the hilly ground they are scattered in small clumps, or sometimes in isolated trees, the drooping boughs of the spruce-firs looking very graceful on the white snow. In places like these the pine-grosbeak may often be seen perched conspicuously on the top of a spruce-fir, twenty or thirty feet from the ground, but looking so much like the last spike of the tree as frequently to escape notice. . . The call-note is a plaintive single note, somewhat like that of our bullfinch, but incapable of being expressed on paper. The song is very melodious, not very loud or long, but flute-like.. When I first heard it, I took it for the song of some rare Siberian thrush, and was quite disappointed when I shot the bird to find it only a pine-grosbeak. The flight is undulating and powerful. We found several nests which could only have belonged to birds of this species, but our search for eggs was unsuccessful. The breeding-season is said to be the end of May or beginning of June. The nests are generally placed in a spruce-fir tree ten or twelve feet from the ground, on a thick branch close to the main stem. The nest is made on the same model as that of the hawfinch and bullfinch, but of coarser materials. The outside is a framework of slender fir twigs; and the inside, which projects above the outside, is composed of roots of fine grass, and a lichen which grows upon the branches of the trees, and might easily be mistaken for hair. . . The number of eggs varies from three to four. . . The ground-colour is pale greenish blue, boldly spotted, principally at the larger end, with surface-spots varying from rich brown to almost black, and with underlying spots of greyer brown." The general colour of the adult male is rosy crimson,

with ashy bases to the feathers; the wings and tail being dusky brown, with the feathers edged with rose-colour. The female has the general colour of the upper-parts ashy grey; the crown of the head and sides of the face golden olive-yellow, spreading on to the mantle; and the throat and under surface ashy grey, washed with golden-olive.

The Crossbills. These are sufficiently distinguished from all other members of the avian class by the crossing of the tips of the two mandibles of the beak. In general conformation the beak is hard, strong, and thick at the base, with the lower mandible curving upwards, and its point crossing that of the upper one; a structural conformation enabling these birds to extract with facility the seeds deeply buried beneath the overlapping scales of the fir-cones on which they feed. This peculiar structure is, however, developed only in the adult, young birds in the nest having the beak of normal conformation. As regards other characters, the crossbills have the wings long and pointed, and the tail forked and relatively short in proportion to the wings.

While the males of the crossbills are gaily attired in scarlet crimson and orange plumage; green and yellow are the predominating hues of the females. Crossbills inhabit the pine-forests of both the Old and New Worlds, extending from Siberia to the Himalaya in the Eastern Hemisphere, and in the Western ranging from Arctic North America into Mexico.

When wandering through the pine-forests of Northern Scotland or Western Norway, the cry of the crossbill (*Loxia curvirostra*) often greets the traveller from amongst the fir-cones, directing his attention to the bright-plumaged birds skilfully extracting the seeds of the conifers, whilst hanging gracefully in every variety of attitude. One such scene is firmly imprinted on our memory; where, while the edge of a pine-wood, richly carpeted with blaeberreries, lay in the background, in the foreground a little flock of crossbills were swinging gaily round the branches of an isolated forest tree; and visitors to Bournemouth will recall memories of these birds among the pines which form their favourite nesting-resort. One of the most recent descriptions of the habits of the crossbill in the nesting-season is by Mr. Ussher, who writes that he has had unusually good opportunities of observing these birds, since no less than four pairs built within a short distance of his house. Among them, one was a male in the immature yellow plumage, while the other three cock-birds were red, or red mingled with brown. Early in March one of these crossbills was observed carrying twigs to the top of a Scotch fir, in which the nest was subsequently discovered, although it could only be seen from the ground by a person standing immediately below it and looking straight up through the tree against the sky. "This tree," writes Mr. Ussher, from whose description the remainder of this account is abbreviated, "is the outer of a group, and is bare of living branches to within a short distance of its top, which consists of a mass of green, bending over from the west winds, in the midst of which the nest was built among the thick tufts. The finder saw the crossbills visit it frequently with building materials; and I saw several times the birds fly to and from it, and recognised the male by his redness. This pair probably reared their young in safety, for, on 10th May, a pair of crossbills were seen feeding their young on larch-trees in the vicinity of this nest. A second nest was subse-

quently discovered, which was in the top of a Scotch fir about two hundred and fifty yards from the first. It was built in the fork formed by several small lateral branches with the leader, which at that point takes a bend; and the nest, which is small for so large a bird, might easily be mistaken from the ground for a knot or enlargement of the crooked leader. It was placed in a perfect little cluster or bower of smaller branches; and was composed externally of fine dead twigs of larch and Scotch fir, and within them of green moss, interwoven with wool, a few horsehairs, and flakes of finer bark. The birds used not to cease their call-notes while flying to a neighbouring tree and thence into the nesting-tree; and the call of the female was heard apparently coming from the nest itself. It was like the syllables *yep yep*, or *yup yup*, while that of the male is much sharper, like *gip gip*. In a young bird taken from this nest the points of the mandibles were straight, not crossed, but the edges of the upper one overlapped the lower on both sides. The down was all gone, and the plumage exhibited dark spots on a lighter ground both on the upper and under surfaces. It was replaced in the tree, from which it must have subsequently fallen, for a nestling was found in the adjoining field and placed in a cage near the nesting-tree, where the old crossbills, which had other young in the trees, continued to feed it often in the presence of observers. In the meantime it became accustomed to feed on bruised hempseed when it was removed to the house, where it soon became full-grown, and tame. The notes of the last pair of crossbills, when excited, used often to attract another pair—the male a red one—that frequented the neighbouring trees, and which on such occasions would join their neighbours in the excitement; their nest was discovered by the birds being seen carrying building materials to it. They picked up bits of hay off the ground, not heeding the observer standing near them.”

Although the crossbill appears to reside permanently in many parts of its range, there can be no doubt of its roving habits; in certain years great flights appearing in the British Isles, and taking up their abode in parts of the country well planted with belts of fir-trees, as was the case in 1888, when numbers of these birds were reported as having made their appearance in different parts. Sometimes, too, large flocks appear on their journey across the North Sea; and in June 1888, crossbills visited the island of Heligoland in numerous flights, varying from ten to fifty birds. Hawthorns in the gardens were then crowded with them, and on some days there must have been hundreds dispersed amongst the foliage. A single straggler was caught about the same time on board the Bull light-vessel, off the mouth of the Humber. The change and coloration of the plumage of the crossbill has given rise to some amount of discussion; but we are inclined to adopt the views set forth in the British Museum Catalogue of Birds. In the full plumage the adult male is pale vermilion above, the feathers having dusky bases: the crown of the head is pale vermilion, like the back and under surface; the primaries and tail-feathers are dark brown; and the lower abdomen, the sides of the body, and the flanks ashy brown washed with vermilion. After the first moult the tints of the male become more orange and uniform, but the flanks are striped, and there are also more or less striped feathers about the other portions of the body. It is now conclusively proved that the bright colours of the male are gradually

assumed, and that it takes two or even three moults before the full red plumage is gained. The plumage of the female differs from the male in being olive-yellow, where the latter is red; the head, lower back, and rump being much brighter than the mantle, which is dusky brown, while the under surface of the body is yellow, with ashy bases to the feathers.

There has been some doubt whether there is more than one species of crossbill, and on this subject Mr. Oates, in his *Birds of British India*, writes as follows:—“The crossbills of the Himalaya (*L. himalayana*) form a very small race, which I think it advisable to keep distinct. There is a very marked difference in size between the Himalayan birds and *L. curvirostra*, from Northern Europe, on the one hand, and *L. japonica*, from Japan, on the other; and the only crossbills which approach the Indian birds in size are from America. Sharpe's view, that all these crossbills form but one species is no doubt correct; at the same time, the Himalayan crossbills are in my opinion quite distinguishable from all others in size, and it is consequently more convenient to retain them as distinct.” The range of the small Himalayan form extends from China and Ladak to Sikhim, and thence into Tibet and Western China; and recently a crossbill (*L. luzoniensis*), has been found in the Philippines.

Nearly allied to the crossbills is the scarlet finch (*Hæmatospiza sipalvi*), from the mountains of Nipal and Sikhim, distinguished by the very strong and stout beak being of normal form. The cock-bird of this species is red, while the hen is green; a remarkable feature of both sexes being the white colour of the bases of the feathers of the head and neck, which are seen conspicuously when the feathers are at all ruffled. The wing is of considerable length, reaching beyond the middle of the tail. The scarlet finch is an inhabitant of both forest and bushy districts, and utters a loud whistling note.

Laysan Finch. The genus *Telespiza* includes a handsome finch recently discovered in the Pacific, and is characterised by the bill being short and much arched, with the upper mandible showing a tendency to cross the lower, as in the crossbill; the wings are of moderate length, reaching to about the end of the basal third of the tail-feathers; the tail is slightly forked; and the feet are remarkably large and strong. This bird is peculiar to the island of Laysan, in the Pacific; and we owe its discovery to Mr. Scott Wilson, who obtained a specimen at Honolulu. This was one of about forty, brought there by Captain Bohm, who had found the birds common among the scrubby bushes covering the surface of their island home, where they were so excessively tame and unsophisticated that their capture with the hand was an easy matter. Mr. Wilson says that a specimen which he brought alive to England has a very clear metallic note, which may be rendered, *chwit, chwee*. It also twitters and chirps as it hops from side to side of the cage, and is altogether lively in its movements; while it is able to force the wires of its cage by means of its powerful bill. The adult has the head and sides of the face olive-green, shading behind into dark chestnut-brown on the back, where each feather has the centre black; the rump and upper tail-coverts are chestnut-brown; the primaries black, edged with yellowish; the tail is black, having each feather edged with greenish yellow; and the throat and breast are bright greenish yellow passing into white on the under-parts.

Other Finches. The Oriental genera *Propyrrhula* and *Pyrrhospiza*, intermediate between the crossbills and rose-finches, are among the most interesting of the remaining members of the subfamily. The red-headed rose-finch (*Propyrrhula subhimalayensis*) is found in the more open parts of the woods in North-Western India. The male has a brownish crimson body with bright crimson forehead, cheeks, and throat, the brown wings and tail having reddish margins: the female is not unlike the female of *Hematospiza sipahi* (p. 404), but much yellower in coloration. The female of the red-breasted rose-finch (*Pyrrhospiza punicea*) is almost exactly like the females of all the species of *Carpodacus*, including not only the common species, *C. erythrinus* already noticed, but the Caucasian species *C. rubicilla* and the Central Asian Severtzow's finch, *C. severtzowi*. The male, however, is easily distinguishable, being a brownish bird with crimson forehead and throat and breast, the crown being black, like the back, the feathers being each margined with light brown. The horn-brown bill is stouter and shorter than that of the red-headed rose-finch, but it is of much the same shape as that of the scarlet finch. The red-breasted rose-finch is a Himalayan bird, ranging from Kashmir to Tibet and Western China at elevations of from ten thousand to seventeen thousand feet. A nest of this species was found in Ladak, built of coarse grass in a furze-bush, and containing greenish brown spotted eggs. Mr. Oates includes in this species *P. lumii*, which is also found in the Himalaya, and has the head and breast rosy instead of crimson, while the brown of the back is quite pale.

THE BUNTINGS.

Subfamily EMBERIZINÆ.

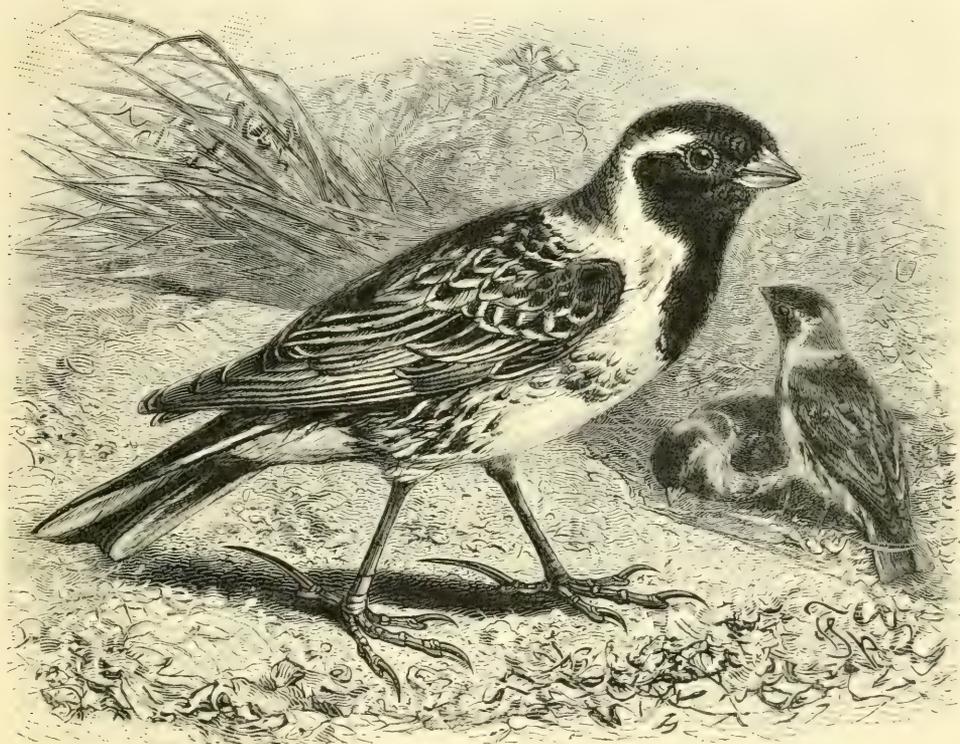
The birds of this large group possess a conical and sharply-pointed bill: but the edges of the two mandibles, unlike those of the other finches, are not in contact throughout their length, forming a gap or angle about midway between the gape and the tip of the bill. The upper mandible, moreover, has the palate furnished with a hard, horny knob. In a few of the species the claw of the first toe is elongated like that of a lark. The great majority of the buntings belong to the northern parts of the Old World, although some species inhabit Central Asia or reside permanently in India; many of them possessing an extensive range. The snow-bunting supports life further north than any other of the smaller birds.

The Snow-Bunting. In this genus (*Plectrophenax*) the bill is small and conical; the wings are very long and pointed: and the tail is moderate and slightly forked: while the claw of the first toe is straight and elongated. The genus is represented solely by the snow-bunting (*P. nivalis*), which is an Arctic form, common to all the northern portions of the world, and occasionally straying on migration into Central and even Southern Europe. Many species of birds migrate over England during the hours of darkness; and on a frosty night at the commencement of winter we have been able to recognise the joyous sound of the twittering of the "snowflake" ringing through the still air as the birds sped on their way through the darkness. Although some snow-buntings pass the entire year upon certain Scottish mountains, it was not until the summer of 1885 that several parties of these birds were

observed on the higher mountain-tops of the west of Sutherland by Mr. Peach, who in the following year captured the young of this species in a corrie. In 1888 Mr. J. Young announced that during the previous summer he had taken a nest of the snow-bunting in the north of Scotland, containing the only eggs of the species discovered up to that time on the mainland of Great Britain. Upon that occasion the observer in question was searching for ptarmigan upon the mountains between Sutherland and Caithness, and while descending some difficult ground he recognised the call-note of the snow-bunting, and with some difficulty reached the nest, which contained five richly-coloured eggs, and was composed of bents and moss, lined with a few ptarmigan's feathers, and one or two small pieces of wool. Since then, additional nests of the snow-bunting have been found in Scotland, one of the number having been secured for the national collection. Professor Newton says that a considerable number of snow-buntings pass the summer in the Faroes, where, on the south islands, they are restricted to the mountain-tops; although, on the northern ones, they frequent the lower grounds in small colonies. Throughout Iceland the species is perhaps the commonest of small birds, a pair or more being established in nearly every convenient locality, even amongst the most desolate lava-streams; and it breeds there almost on the sea-level as well as up to the snow-line. As is shown by the accumulation of old materials often found therein, the birds commonly use the same nest-hole more than once. The eggs vary from four to six in number, and are white in ground-colour, more or less tinged with palish greenish blue, splashed with dull lilac, and spotted with brownish red. They are laid in a nest built of dry grass and roots lined with hair or soft feathers, especially those of the ptarmigan. The snow-bunting has occasionally nested, and even hatched its young in confinement; but we are not aware of the young having been brought to maturity under artificial conditions. The adult male has the crown ruddy brownish black; the scapulars are black, edged with reddish brown; the primaries black; the secondaries white, the outer ones being marked on both edges with black; the central tail-feathers are black tipped with white; the under tail-feathers white streaked with black on the outer edges; a rusty band crosses the breast, and the lower-parts are white. In summer the light tips to the feathers of the upper-parts are shed, and the bird then appears to be black and white, black predominating.

Lapland Bunting. One of the most widely distributed of small birds is the Lapland bunting (*Calcarius lapponicus*), a circumpolar bird, inhabiting the high northern regions only during the summer months, and migrating southwards to more congenial winter quarters before the arrival of frost and snow in its northern home. It is also found throughout the northern parts of North America. During the summer season this bird frequents the fell-mosses of Norway and Sweden, especially such as are covered with grass and willow-scrub and are situated below the snow region. Not inhabiting the high mountains on which the snow-bunting breeds, it prefers the upland swamps, and Mr. Seebohm states that in Northern Europe the Lapland bunting seeks the swampiest ground it can find, so long as there are tussocks of dry grass full of flowers where it can breed. If there be also a few stunted willows or birches upon which it can perch, so much the better. The nest is nearly always placed in some hole in a side of the little

mounds or tussocks abounding on the marshy parts of the tundra, and is composed of dry grass and roots, and profusely lined with feathers. The eggs vary from pale grey to pale brown in ground-colour, and are streaked with dark brown with underlying blotches of brown. Nests of this species found in Norway were built of dry grass and lined with feathers; one in particular being lined with the feathers of a snipe, and thus having an unusually pretty appearance. The newly-hatched young are said to be clothed with dark down. The song of this bunting, which is sweet and musical, is usually poured forth when the bird is in the air,



LAPLAND BUNTING ($\frac{2}{3}$ nat. size).

soaring like a lark, and is continued until it alights on some grassy knoll or stunted bush. Oddly enough, the female has almost as rich a song as the male. Formerly the Lapland bunting rarely straggled so far westwards as the British Isles during its autumnal migration, but nowadays it not only breeds nearer than it used to do, but small numbers of this bird visit the southern shores of Great Britain yearly. Before 1892 the Lapland bunting had been captured most frequently in Kent, more particularly near Dover; but in the autumn of that year great numbers visited Eastern and Southern England: the first arrivals being observed in Norfolk during September, and these being soon after followed by large flocks. Numbers were also obtained during the winter of 1892-3 on the downs near Brighton; and the species has occurred in equal abundance in Northumberland. Lapland buntings, according to Mr. Gurney, become tame

sooner than snow-buntings, while their notes are somewhat more silvery in tone. "In captivity their habits seem no more terrestrial than snow-buntings. As spring drew on, the tints of the birds in my aviary were observed to deepen, and they even showed a disposition to nest by carrying about bents of hay." The male Lapland bunting in breeding-plumage has the entire head, throat, and upper breast black; a rich chestnut collar reaches from behind the head on to the back; and the upper-parts are brownish black margined with buff and white. The adult female differs from the male in having light margins to the feathers of the head, throat, and flanks, while the feathers of the chin and upper throat are buffish white, with half-concealed black bases. After the autumnal moult, all the feathers have light edges. Males of the year closely resemble adult females, but differ from them in having no black centres to the feathers on the nape.

The Typical Buntings. The genus *Emberiza* includes the typical buntings, all of which are crestless, and have forked tails; the bill being hard, short, and conical; the first primary small, and the fourth or fifth commonly the longest in the wing, and considerably longer than the next; while the metatarsus is covered with scales in front and on the sides, with an entire plate forming a sharp ridge behind. These buntings are represented by numerous species from the temperate and northern parts of the Old World, as well as from North Africa and India.

Reed-Bunting. The reed-bunting or reed-sparrow (*Emberiza schæniclus*) is found on swampy ground over almost the whole of continental Europe from the South of Spain to the North Cape. Among the aits and osier beds of the Thames and its tributaries, it forms a conspicuous object in the summer time, as it chants its sweet snatches of song from some prominent position by the waterside. The female builds her nest among rushes or long grass on the side of a bank, or in a dense tussock of the morass which forms her home, not unfrequently amid a tiny forest of cotton-grass, whose white tufts of delicate down transform a few acres of black bog into a miniature paradise of beauty. The eggs are drab in ground-colour, and streaked with black and dark purple. The young of this bunting, like those of certain other species which nest upon the ground, frequently leave their nest before they can fly, trusting to their protective colours to secure their safety. Resident in some districts, this bunting in others is a partial migrant, a considerable number passing the winter in the British Isles, where they occasionally seek shelter in the centre of large woods at a distance from their usual aquatic haunts. Their food consists of seeds of water-plants, small molluscs, and insects; but occasionally they feed in the stubble-fields. The bird is gregarious, and fond of associating in small and even large flocks during the winter and spring months. We have but rarely come across white individuals of this species, nor have we yet examined a pied specimen. The general colour of the adult male in the breeding-season is rufous, with broad black centres to the feathers of the back; the wing-coverts are chestnut; the primaries blackish, edged with rufous; the tail-feathers dark brown, the two outer ones being edged with white; the crown of the head as well as the sides of the face and ear-coverts are entirely black, and separated from the back by a broad band of white, which forms a collar joining the white sides of the head; the throat is black, and the remainder of the under surface white, streaked with black on the sides of the body.



BUNTINGS.

1. Reed; 2. Yellow; 3. Common; 4. Lapland; 5. Snow.

Little Bunting. Among the Arctic birds from time to time straying into Western Europe during their seasonal migrations, must be mentioned the little bunting (*E. pusilla*). Near Archangel Messrs. Alston and Harvie-Brown found it very common in the summer; although local in its choice of nesting-grounds. They often heard its low, sweet song, which is compared rather to that of a warbler than of a bunting, and they observed that it frequented the pine-woods and mixed timber. Mr. Seebohm supplies the following account of his finding the eggs of this bunting in the valley of the Yenesei. There "it was extremely abundant, and its unobtrusive and quiet song was constantly heard before the snow, which was lying to a depth of five or six feet up to the first of June, had sufficiently melted to make the forest penetrable. I found the first nest of this bird on the 23rd of June. I was on the south bank of the Koorayika, a tributary of the Yenesei, and was scrambling through the forest down the hill towards my boat, amongst tangled underwood and fallen tree-trunks, rotten and moss-grown, when a little bunting started out of the grass at my feet. It did not fly away, but flitted from branch to branch within six feet of me. I knew at once that it must have a nest; and in a quarter of a minute I found it, half hidden in the grass and moss. It contained five eggs. I have seldom seen a bird so tame. The nest was nothing but a hole made in the dead leaves, grass, and moss, copiously and carefully lined with fine dead grass. I took a second nest in the forest, on the opposite bank of the river, on the 29th of June, containing three eggs; this nest was in a similar position to the foregoing, and the behaviour of the parent bird precisely the same. On the 30th of June we cast anchor about one hundred and ten versts below the Koorayika, and I went on shore to shoot, and found a third nest of this interesting little bird, containing five eggs which were slightly incubated; this nest was lined with reindeer-hair. On the 6th of July, a few miles further down the river, I went on shore again and found another nest of the little bunting, this time containing six eggs; it was similar to the last, rather more sparingly lined with reindeer hair, but the tameness of the bird was just the same. The eggs in the first nest are very handsome, almost exact miniatures of those of the corn-bunting. The ground-colour is pale grey, with bold twisted blotches and irregular round spots of very dark grey, and equally large underlying shell-markings of paler grey. The eggs in the second nest are much redder, being brown rather than grey, but the markings are similar." The adult male little bunting in breeding-dress has the upper-parts rufous brown, with broad black centres to the feathers; the centre of the crown is vinous chestnut, with a broad black streak on each side, forming a band; a superciliary line, lores, sides of face, ear-coverts and throat, are all vinous chestnut. The remainder of the lower-parts are dull white, the lower throat, fore-neck, and breast, as well as the sides of the body, streaked with black. The adult female scarcely differs from the male, but is not quite so bright coloured.

Common Bunting. This dull-coloured heavy bird (*E. miliaria*) is common in many parts of Europe, from Southern Spain to the Hebrides; but being to a large extent dependent upon grain-crops for its existence, its distribution naturally varies with that cereal. Sometimes it frequents the pastures, uttering its droning song from the top of some tall hedgerow tree; but more often it frequents arable

fields, where it utters its short mechanical song from a clod of earth, a clump of dockweed, or the coping of some stone wall or turf dyke. Although Mr. Dresser asserts that the corn-bunting, as this species is often termed, is seen only in pairs during the breeding-season, we have seen as many as a hundred of these birds flying together at the end of May, and can vouch for their associating together in numbers even in the nesting-time. Sometimes they roost upon the ground like skylarks, but we have known them roost habitually in a fir-plantation. They feed partially on insects, but in autumn and mid-winter they appear to subsist almost entirely on grain. The nest of the common bunting is a loose structure, built



ORTOLAN BUNTING AND BLACK-HEADED BUNTING ($\frac{2}{3}$ nat. size).

upon the ground in a tuft of rough herbage, and constructed of dry grass bents and pieces of moss, lined with finer stems of grass and sometimes a little hair. The eggs vary greatly in coloration, being either white or buff in ground-colour, blotched and streaked with purplish brown, grey, and pale brown. Not unfrequently the common bunting assumes a white or cream-coloured plumage: one shot a few years ago being as yellow as a canary. The usual colour is dull brown above, streaked with darker brown; the under-parts being buffy white, and the breast and flanks streaked with black.

Black-Headed Bunting. South-Eastern Europe is the home of the handsome black-headed bunting (*E. melanocephala*), which but rarely strays into Western Europe, though it has been obtained repeatedly upon the island of Heligoland, and

on two occasions in Great Britain. In Greece and Turkey, on the other hand, it is a common summer bird. Lindermayer gives the following account of its habits:—“This bunting arrives always in the last five days of April in Greece, and, like other migrants, appears everywhere at once, so that the flats near the sea, which are covered with vines and other creepers, and also places where the olive-trees are scattered about, are alive with this lovely and melodious bird. It is peculiarly partial to vineyards, where it builds on the vines, pomegranates, thorns, or almond trees. Its nest is always formed of dried straws, and is carefully made and lined with horsehair. Five eggs are the usual complement, and these are pale sea-green, covered with scattered dark brown spots, though sometimes quite unspotted. I have received hundreds of nests, and often found them myself, as they are not difficult to discover, the bird not being at all shy, and only leaving the nest when approached within a distance of about a yard. I have often known the female to lay afresh after her eggs have been removed. During the breeding-season the male sits near the nest, on a branch or a tree-top, and continually serenades his mate with his sweet song. If scared away, even by a shot, it retreats to the nearest tree and continues its song.” This bunting much resembles the common species in general habits, often sitting on the top of a bush or low tree, and pouring forth its simple notes, or flying from one elevated part to another with its legs dangling down. The adult male in the breeding-time has the crown and sides of the head black, the entire back and scapulars chestnut, the primaries and tail-feathers brown, the whole under surface, as well as the sides of the neck, rich canary-yellow, and the sides of the breast and flanks chestnut. The female is a dull-plumaged bird by comparison with her brilliant mate, having the upper-parts nearly uniform brown, but the under-surface yellow, with ashy margins to the breast feathers, and the flanks tinged with ash colour.

**Yellow-Breasted
Bunting.**

This beautiful bunting (*E. aureola*) is distributed over the northern parts of the Old World from Russia to the Pacific, and has even strayed as far west as Heligoland, and been captured also in Italy. Dr. Dybowski found this bunting to be one of the commonest birds in Eastern Siberia, where it frequents the valleys, particularly on the plain, and where bushes abound. It generally perches on the top of a plant or bush, and there sings continually, its song being short and often interrupted, but sweet. The peasants look on it as the best songster in Dauria; but that is according to their taste, for there are many other birds there which sing better. These birds arrive on their breeding-ground about the middle of May, and commence building their nests early in June, although most of them only begin breeding late in this month. Their nests are placed on the ground and constructed of dry bents, lined with horsehair. The female sits hard, and will permit anyone to approach quite close to her: while, when driven off her eggs, she keeps flying about with the male closely in attendance, perching every now and then on the neighbouring bushes, and uttering a note of lamentation like that of the whinchat. The eggs of this bunting generally resemble those of the reed-bunting, but the ground-colour is tinged with greenish. In the neighbourhood of Archangel the yellow-breasted bunting constantly frequents swampy meadows, or marshes overgrown with birches and willows. The general colour of the male is deep chestnut: the forehead, sides of the face, and upper throat being

jet-black, and the under-surface of the body bright yellow, except that the chest is banded by a zone of chestnut. The female is greyish brown, like a hen-sparrow, above; the lower-parts being pale yellow, striped on the flanks with dark brown.

Yellow Bunting. The yellow bunting (*E. citrinella*) is a common bird in Northern Europe, extending eastwards into Siberia, and frequenting alike the more cultivated valleys of Norway and the south of Europe. Mr. Dresser observes that it is to be seen on almost every hedgerow in many parts of England. "Perched on the top of the highest available twig, the male may be heard incessantly pouring out his monotonous but not disagreeable song, and during the breeding-season his notes fall upon the ear from the early morn till late into the evening. As twilight sets in, the yellow bunting may still be heard, and is perhaps the last bird to give a parting note to the retiring day, with the exception of his congener the corn-bunting, who sings till it is quite dusk." The yellow bunting generally nests upon some bank, occasionally in a furze bush. The eggs are white, scribbled over with fine, hair-like markings. In autumn the yellow buntings collect in flocks, feeding on blackberries and other wild fruits, as well as upon all the grain that they can glean in the open fields. As the season advances, they seek the neighbourhood of homesteads, and search for worms and other insects upon heaps of manure. Although the yellow bunting is generally supposed to be a resident species in Great Britain, there can be no doubt that it is only a summer visitant to its more northern breeding-grounds. Large numbers of this species sometimes occur on migration at Heligoland. The male has the head and throat bright yellow, and the back brown, inclined to rufous, all the feathers having dark centres; the wings and tail are blackish brown, the outer tail-feathers having the inner webs partly white. In winter the plumage is rendered more dingy by fulvous edgings to the feathers. The female is greyish brown above, having the lower parts of the back, the rump, and upper tail-coverts pale cinnamon; the lower-parts being citron yellow and the upper breast mottled with brown and tinged with olive-green.

Cirl Bunting. Closely allied to the last, but more pleasing in both character and coloration, is the cirl bunting (*E. cirrus*), which is thinly distributed through Central Europe, being in some districts even more common than the yellow bunting, but generally taking rank as a scarce bird. English ornithologists know it best as a resident in the southern counties, particularly in the west; but it has nested as far north as Yorkshire. It is numerous in North Devon, around Barnstaple especially, where it is a shier bird than the yellow bunting, and is fond of concealing itself in the spring and summer in thick hedges. Both in the spring and again in the autumn the male bird is often to be seen perched on the branch of some hedgerow elm, from whence he delivers his very unpretending song.

In Germany the cirl bunting is migratory, leaving its northern habitat in November, perhaps even much earlier, and wintering far to the southward, and returning in April. It frequents the same kind of places as the yellow bunting, such as the bushy banks of streams, meadows, and hedges, small groves and mountainous districts in the neighbourhood of fields and gardens. In many other respects the cirl bunting resembles the yellow bunting. In spring it prefers to take up its position in a high and open place on the tops of trees, but later in the season

is found lower down, and always likes to hide in dense thickets. It hops a good deal upon the ground, is by no means shy, and when frightened up, soon settles on the nearest low bush and shows little fear. In its flight it also resembles its near relative, quarrelling and snapping at it when none of its own species are near with whom it can fall out; and it is equally quarrelsome, and at times as restless as that bird. These buntings eat both insects and seeds. Although Mr. Seebohm considers that the song of the circl bunting bears some resemblance to that of the lesser redpoll and lesser whitethroat, it still more closely resembles that of the yellow bunting, but is never ended with the long-drawn note which marks the song of the



CIRCL BUNTING AND MEADOW BUNTING ($\frac{2}{3}$ nat. size).

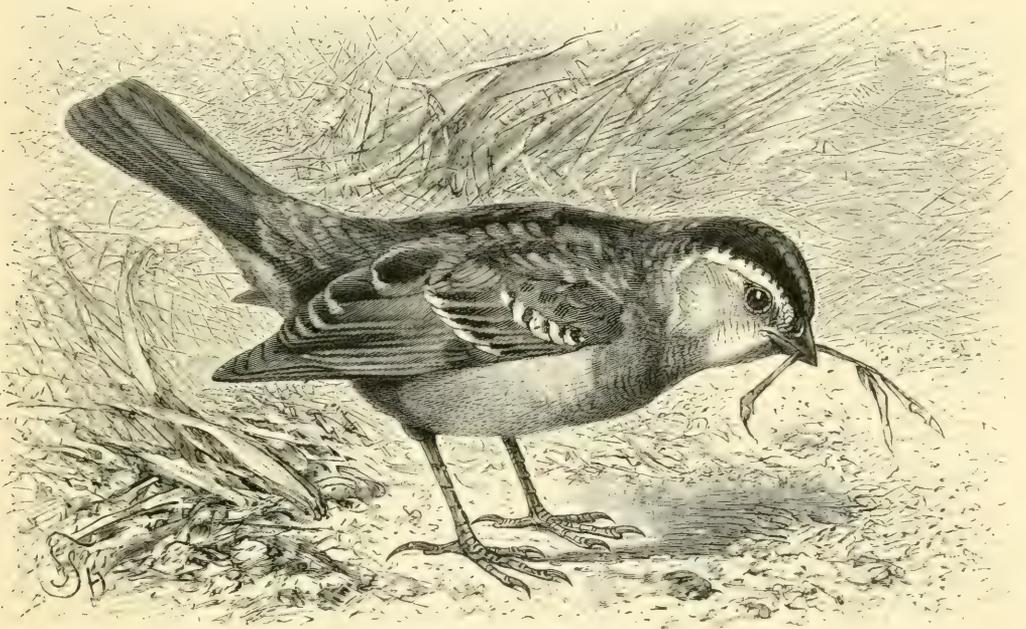
latter. The circl bunting breeds early, nesting in positions similar to those adopted by the yellow bunting, and constructing its nest on a bank or amongst briars and brambles, usually at no great distance from the ground. The nest is built of dry roots and grasses, lined with fine roots and a little hair. The eggs are bluish white, in ground-colour streaked and blotched with very dark brown; two clutches being usually laid in a season. The song of the male commences early in the year, and is usually delivered from the lower branches of an elm or the top of some hedgerow tree, but occasionally from a bare telegraph wire. It is continued throughout August and September. In hard weather circl buntings associate with other birds, such as larks, in the open fields. In confinement the circl bunting is a shy species, very difficult to tame: although Montagu reared a young one from the nest, which

was sufficiently tame to take insects from the hand, showing a great partiality to such a repast, and, when let out of the cage, catching flies in the windows. The ciril bunting bears some resemblance to the yellow bunting in plumage, but the male is readily distinguished by the fact that the head and nape are olive-green, and the rump and upper tail-coverts olive-green streaked with dusky; while a bright stripe extends over the eye, and another below it. The wings and tail are similar to those of the yellow bunting, but the lesser wing-coverts are olive-green instead of chestnut. The throat is dull black, below which is a broad patch of yellow, and a zone of olive-green extends across the breast, shading into chestnut. The female ciril bunting can always be distinguished from the female yellow bunting by the head never showing any trace of yellow, the under-parts being not so bright a yellow; while the rump and upper tail-coverts are olive instead of chestnut.

Ortolan Bunting. The far-famed ortolan (*E. hortulana*), shown in the upper figure on p. 410, for which fabulous prices were sometimes paid by the epicures of the last century, is a near relative of the ciril bunting; and, like that species, is more common in Southern Europe than further north. The tameness of the ortolan buntings outside the city of Pampeluna, in Spain, is almost ludicrous. So little do they apprehend injury, that they will allow visitors to lie on the grass while they forage round for earth-worms; these birds feeding partly on grass seeds and partly on worms. The ortolan bunting often resorts to the edges of thickets and the skirts of fir-woods; and its song somewhat resembles that of the yellow bunting. In Sweden the ortolan sings both during the day and throughout the light nights of the Arctic summer. The nests, which are invariably placed upon the ground, and generally in the open fields, are built of dry grass or roots, and lined with fine fibres or hair. The eggs vary in ground-colour from bluish white to pale salmon colour, spotted and blotched with rich purple-brown. Mr. Seebohm observes that "it is somewhat remarkable that a bird so common on the Continent, and all the countries adjacent to the British Islands, should be so rare in Britain. I found the ortolan bunting breeding on the mountains in the pine regions both of Greece and Asia Minor. When I was at Valconswards we constantly heard its plaintive, monotonous song as it sat perched for a long time on the branch of a tree, in the lanes or in the hedges that surrounded the fields close to the village; and in the wilder districts of Norway it was by no means uncommon in the trees by the roadside. It is not a shy bird, and frequently remains for a very long time on the same twig, generally near the top of the tree, especially in the evening, when its simple song harmonises with the melancholy stillness of the outskirts of the country village. Throughout Europe it is a strictly migratory bird; in Greece and Asia Minor, where the season of the spring migration may be said to be the months of March and April it ranks amongst the later migrants. In South Holland the season of 1876 was a somewhat late one, and the arrival of migratory birds began during the last week of March and ended during the last week of May; and it was not until the middle of the latter month that we heard the song of the ortolan bunting. These birds leave Europe in September, arriving in North Africa in large flocks. On their way south great numbers are caught in nets and fattened for the table, and many are sent to this country alive from Holland and

Belgium. The adult male has the head grey, tinged with greenish yellow : a ring of feathers round the eyes and throat being pale citron-yellow ; the general colour of the upper-parts is reddish brown with black streaks to the feathers of the mantle and back ; the eyelid is white ; the fore-neck and chest are dusky greenish olive, and the remainder of the under-parts is reddish cinnamon.

Meadow Bunting. The meadow-bunting (*E. cia*) is a lively member of the family met with, locally, in many parts of Central Europe, living chiefly in mountain-valleys such as those to be found in Central France. Each pair generally occupies its own particular district, and, while the females incubate their eggs, the males rehearse their songs, generally perching in a prominent position on the top of some bush. The nest of the meadow-bunting is made of



THE SPARROW-BUNTING.

dry stalks and moss, lined with horsehair and wool. Mr. Dresser found this bird numerous in the neighbourhood of Barcelona, where it frequented the cactus hedges, flying when disturbed from plant to plant, and often perching on the very top of the cacti, uttering its call-note, *zi zi zi*. This species chiefly affects the hill-sides and barren dry places where but few stunted bushes are scattered about ; but in some parts of Europe it has been found frequenting the vineyards. It feeds on various seeds of wild plants, and to some extent on insects. The eggs are easily distinguished by their continuous markings, which appear as if they were made by a pen without taking it from the surface of the egg. In colour they are pale grey, marked with blackish brown lines. The adult male has the head and neck bluish grey, with two black bands along the sides of the crown, and two other black bands passing through the eye, forming a moustache : while the upper-parts are bright russet, streaked with black : the rump chestnut-red : the throat white : the

neck and chest delicate bluish grey; and the rest of the under-parts russet-red. The female has the head, nape, and body varied with black and russet; the rump and under tail-coverts bright russet; the front of the neck and chest shaded with dull grey and spotted with brown: and the flanks of a deeper russet, and more or less spotted with brown.

Allied Genera. There are several genera more or less closely allied to the true buntings, which can only be incidentally alluded to here. Among these, the crested bunting (*Melophus melanicteris*), of the Himalaya, Upper India, Burma, and China, is the only representative of a genus characterised by the presence of a crest on the head, which is larger in the male than in the female. The tail is less forked than in the true buntings; and the sexes differ in coloration, although both display a considerable amount of red on the wings and tail. This bunting is solitary in its habits, and generally found on rocky hills and the banks of streams. The American bunting (*Euspiza americana*) represents a second genus, and the Cape bunting (*Fringillaria capensis*) a third, in which there are several species. The sparrow-bunting (*Zonotrichia albicollis*), belonging to a group of genera in which the tail is longer than the wing, differs from the true buntings by the exposed nostrils, which are protected by an operculum; and is especially characterised by the spotted back and sparrow-like form. The genus, which includes numerous species, is exclusively American.

H. A. MACPHERSON.



CHAPTER IV.

THE PERCHING-BIRDS,—*continued.*

LARKS TO WAXWINGS.

Families *ALAUDIDÆ* to *AMPELIDÆ*.

REPRESENTED by upwards of a hundred species, arranged under several generic heads, the larks form a family which is almost entirely confined to the Old World in its distribution; some of the more highly-specialised forms being peculiar to desert-regions, where they have become specially adapted to their environment both in structure and in their protective coloration. The shape of the bill varies too much in different genera to be of value as a diagnostic character; but the feet are well defined. Thus the metatarsus is scutellated, and blunt behind as in front; that is to say, it is covered with two series of plates behind and before, which meet on the inner surface of the limb. Other characters are the very long straight claw of the first toe, the long pointed wing, and the lengthened inner secondary wing-feathers. Save for a notch in the upper one, the edges of both mandibles are perfectly smooth.

The Skylarks. The birds of the genus *Alda* are distinguished by having the first of the ten primaries very small, while the second, third, and fourth are nearly equal, although the third is somewhat the longest; the secondaries are comparatively long; and the tail is moderate and slightly forked. The bill is rather slender, long, arched, and slightly compressed, with plumelets covering the nostrils. The skylarks, of which there are but three species, are principally found in the temperate portions of Europe and Siberia, although extending their range southwards into China and the plains of India. The common skylark (*A. arvensis*) is one of the most abundant of European birds, nesting in the British Isles, which are also visited by myriads of this species from the Continent during the autumn and winter months. So great is their abundance that they have become an extensive article of commerce: and on the Sussex Downs extraordinary numbers are netted to supply the poulterers. Popular sentiment has never failed to recognise the exceeding beauty of the liquid notes of the lark, its cheery carol far surpassing that of all other British birds save the nightingale. Frequenting heaths and pasture lands, and generally most abundant in open country, during the winter the skylark is a gregarious species: and on a sharp frosty morning many hundreds may be observed congregating in a single field, flying restlessly hither and thither, with low warbling call-notes to their companions. The salt-marshes bordering upon many parts of the British coasts are well adapted to the habits of the skylark: the birds generally placing

their nest in the side of a tussock of rough grass. It is a simple structure, lined with fine grass. The young are exposed to the attacks of ground vermin, owing to their being reared upon the ground; but they are screened from their enemies by the highly protective character of their first plumage, which is spotted with buff, and assimilates to the colour of dried grasses even more closely than the darker tints of the adult birds. The skylark sometimes nests in very



SKYLARK, WOODLARK, AND CRESTED LARK ($\frac{2}{3}$ nat. size).

exposed situations; one pair having built their nest on the bank of a cricket-field, immediately abutting upon a highroad. In the breeding-season it is a singularly fearless bird; and the parents of a young brood will often allow a stranger to approach within a very few yards before they take wing. Waited upon by their parents most sedulously, the young birds leave the nest long before they are strong upon the wing; these "pushers" being often caught alive by boys, who take advantage of their feeble flight to capture them when exhausted, after a short but persistent chase. In confinement the skylark

retains its kindly character, a fact well known to bird-dealers, who often place an old skylark in a cage with a brood of young birds, knowing by experience that the former is sure to take compassion upon the helpless nestlings. The young birds reared from the nest become exceedingly attached to their owners, and readily acquire the notes of any bird under whose tuition they may be placed. Such birds as are captured adult, and in open weather, are, however, apt to pine for the loss of their liberty; but those that are caught when deep snow is lying on the ground are more susceptible of domestication, and soon begin to sing. The eggs of the skylark are white in ground-colour, thickly blotched and freckled with brown and grey. Young birds may be found in the nest at any time from April to September. Skylarks do not wash, but delight in cleansing their plumage by dusting their feathers in dry earth; this being done in order to remove ticks or other parasites that may be adhering to them. On their migrations, skylarks often appear at the light-houses in dense hordes, and vast numbers are killed upon the island of Heligoland. Although the song is principally uttered during the spring and summer months, we have often heard wild larks singing in snatches in November, and in the Highlands the skylark begins to sing in summer about an hour before daybreak.

The food of the skylark consists of the seeds of oats, wheat, barley, and wild plants, together with such insects as it meets with in the ploughed fields. In plumage these birds are subject to considerable variation, so much so as to constitute local races. Black, white, and cream-coloured varieties occur occasionally, but only in very small numbers in comparison with the abundance of birds in ordinary plumage. The adult has the upper-parts brown, tinged more or less with rufous, many of the feathers having dark centres: the wings are dark brown, the primaries being narrowly edged with white on the outer webs; the tail is brown, with the exception of the outer feathers, which are nearly all white; the throat and breast are buff, streaked with brown; and the rest of the under surface creamy white. Both sexes are alike.

The Woodlark. Although formerly included in the same genus with the skylark, the woodlark (*Lullula arborea*) is now very generally referred to a genus apart, of which it is the sole representative. It may be readily distinguished from the former by its shorter tail, more distinctly marked breast, and by a distinct light streak over the eye and ear-coverts; while its size is considerably smaller. It is figured on the illustration on p. 418. Unlike the skylark, which frequents open country, the woodlark prefers fields that border upon woods,—“in localities,” writes Mr. Dresser, “where the soil is sandy and partially covered with second growth, large trees being sparsely scattered here and there; this species is generally numerous but it does not frequent the dense forest. In its habits it is lively and sprightly, fond of the society of its congeners, and not quarrelsome, but rather more shy than the skylark. It frequents the ground far more than is commonly supposed, and indeed only perches occasionally upon the outer branches, chiefly during the breeding-season, when singing. It seeks its food almost always, if not solely, on the ground, and runs with celerity and ease. It roosts on the ground in open places close to the woods, under weeds or grass, or in the old weed-covered furrows, and retires early to rest. It is more affected by the cold weather than the skylark,

and migrates earlier to the southward than that species. Its song is sweet and flute-like, more melancholy than that of the skylark, and is generally uttered from the top of some tree, or else when the bird is on the wing. It rises to some height before commencing, then ascends, singing, higher and higher, throwing itself from side to side, hovers and floats in the air, and when the song is ended drops with closed wings to the ground again. It sings not only in the mornings and evenings but also at other times of the day, and in the night, especially at night."

The woodlark constantly builds upon the ground, usually in a tuft of grass, or in a depression of the earth, sheltered by a low bush. Built of stems of grass and moss, and lined with hair and wool or fine bents, the nest is more compact than that of the skylark. The eggs are generally white in ground-colour, finely freckled, and blotched with brown and purplish markings, which are often bold, and sometimes arranged in a zone. The woodlark occasionally nests in confinement. A very local bird in the British Isles, especially in the breeding-season, when it is chiefly found in the southern and western counties, particularly Devonshire, the woodlark is common in Southern Norway and Sweden, and extends eastwards through Central Russia, ranging south to Spain, Morocco, and Egypt. The plumage of the adult is brown above, each feather being striped with dark brown and edged with rufous; a broad, yellowish white stripe extends from each eye to the nape, forming an irregular collar; the rump and upper tail-coverts are greyish brown; and the tail is dark brown, with the central pair of feathers much lighter than the others, while the outer pair are dirty white towards the tip, and their outer webs bordered with white.

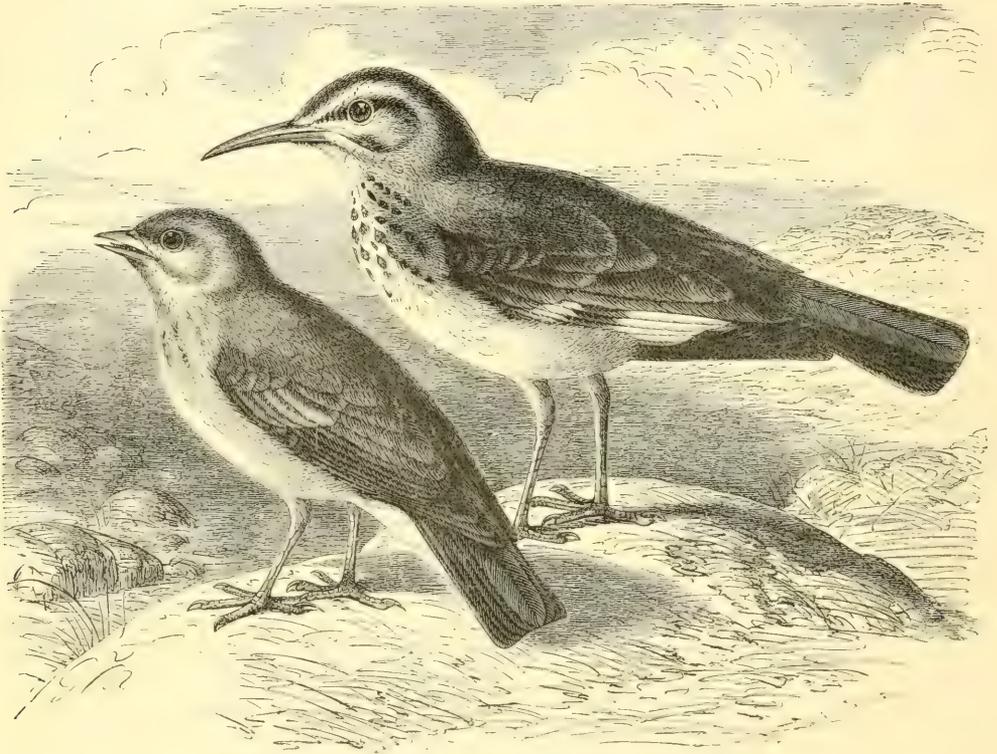
The Crested Larks. The crested larks, as typically represented by the European species (*Galerita cristata*), are sufficiently distinguished from both the foregoing genera by the presence on the head of a crest composed of a few very long feathers springing from the centre of the crown. The common species is a partial resident in Continental Europe, and a rare accidental visitor to the shores of Great Britain. In the spring of the year it may be seen in the north of Spain travelling in flocks apparently composed exclusively of its own kind, which generally frequent the ploughed fields in preference to grass-lands. These large flocks are relatively wild; but on other occasions crested larks may be observed running tamely on the turf bordering the highroad, elevating their crests as they run along together. Mr. Dresser states that "in its habits the crested lark is confiding and fearless, and in the neighbourhood of villages and inhabited places is one of the most unsuspecting and tame birds. When in Southern Germany and Hungary, where it is very common, I observed it on almost all the highroads and in the streets of the small towns and villages pecking about amongst the horse-droppings almost as tamely as a London sparrow. They appear very fond of inhabited places, and frequent highroads, seldom being found very far from these, and when disturbed by a passing vehicle will either run on one side and let it pass, or fly on, again and again, as the traveller approaches them. In different parts of Europe they are resident or migratory according as the locality is suitable or not for winter quarters; but in most parts they are partial migrants, merely shifting their quarters according to season." In Germany, Naumann writes, "they leave their northern haunts in the winter, which

they spend in smaller or larger companies in milder climates. Many winter on the Main and Rhine, and in Franconia and Thuringia, arriving there in October and November, and disappearing at the first commencement of spring. Here in Northern Germany these larks are resident or partially migratory, these latter rambling in pairs or small companies from place to place, and arriving in winter where they are not observed in summer, but seldom remain there long. The time of migration is in November and December. Old pairs remain year after year at the same breeding-place. They migrate from the one inhabited place to the other in the daytime, generally in the forenoon, and fly at a considerable altitude." The song of the crested lark is sweeter and in some respects more pleasing than that of the skylark. This lark nests upon the ground in any small depression of the soil or behind a clod of earth; the nest being loosely and simply constructed of stems of dry grass and fine roots, sometimes lined with a little horsehair. The eggs are greyish white in ground-colour, marked with dark or light brown and grey. Fresh eggs may be found from the middle of April until the middle of July. The crested lark is a favourite cage-bird in Germany; and it may be seen from time to time exposed in the Paris bird-market. In India the crested lark is frequently caged, and kept in darkness by its cage being wrapped in a cloth. In this state it learns to sing very sweetly, and even to imitate the songs of other birds. The crested lark has the upper-parts brown; the feathers of the neck and back having dark centres fringed with buff; the crest is conspicuous, and consists of nine or ten narrow feathers, blackish brown in colour, edged with buff; the lower-parts are creamy white; while the sides of the throat are spotted with blackish brown; the feathers of the breast and flanks being streaked with dark brown.

The Desert-Lark. In this genus (*Alamon*) the bill is very long and slender, gently curved on its terminal half, while the nostrils are fully exposed to view: the first of the ten primaries of the wing being small, but exceeding the primary coverts. The toes and claws are very short, and the latter are stout. The plumage is the same in both sexes.

The desert-lark (*A. desertorum*) inhabits the deserts of Arabia and Northern Africa, extending eastwards into Afghanistan and Western India. It is thinly distributed throughout the desolate wastes in which it finds its home, living in pairs, each of which enjoys the run of its own territory. This lark traverses the sandy plains with great celerity. The song of the male is often uttered in the breeding-season, but it is short and unpretentious. Breeding in May and June, when it makes a small nest of dried grass on the sand, the desert-lark lays eggs, which are greyish white, marked with yellowish brown. The plumage of many birds has become modified in order to serve the purposes of concealment from their enemies: and the desert-lark, like other species that haunt sterile wildernesses, has gradually assumed a plumage of an isabelline grey, tinged with ash on the forehead and upper tail-coverts. The first primaries are black, with white bases: the tail-feathers black margined with fulvous, the two central feathers being sandy brown, broadly edged with very bright fulvous: a black streak passes through the lores with a white band above and beneath: a black band passes backward from the eye; the chin and throat are white, as is the abdomen; but the fore-neck and breast are pale fulvous, spotted with black.

The Finch-Larks. Another genus (*Ammomanes*) belonging to the group, with ten primaries to the wings, is formed by the finch-larks, of which the African finch-lark (*A. deserti*) is represented in the left-hand figure below, while other species inhabit India. Having the first primary long, as in the preceding genus, these larks are specially distinguished by the thick beak being much shorter than the head, and the nostrils concealed by plumelets. They inhabit



THE AFRICAN FINCH-LARK AND DESERT-LARK ($\frac{1}{2}$ nat. size).

open arid plains, from which they rise singing in the air for a short distance, and then suddenly drop.

There are several other genera of the group, such as the Asiatic bush larks (*Mirafra*), which may be distinguished from the finch-larks by the open nostrils.

The Short-Toed Larks. The short-toed larks, genus *Calandrella*, are inferior in size to most of the family, and have the bill short and stout, with the upper mandible arched; while there are only nine primaries in the wing; of which the first is long and reaches to the tip; the inner secondaries being lengthened and reaching to the end of the primaries, or nearly so; and the tail being rather long and slightly forked; and the claws slightly curved and very short. Five species of short-toed larks inhabit Europe and Northern Asia, and three others are found in India.

The European short-toed lark (*C. brachydactyla*) is a common species in Southern Spain, and is one of the most characteristic of birds of Malta during

the summer months, frequenting the wildest parts of the island, where its song is frequently uttered, as the male thus encourages his mate in the duties of incubation. Its range extends eastwards to Turkestan, and in winter it visits Upper India. Its mode of ascending in the air differs from that of the skylark, consisting of a succession of jerks. The short-toed lark is caught in considerable numbers by the French bird-catchers, to judge from the frequency with which we have found the species for sale in the Paris bird-shops. Its food seems to consist almost exclusively of small seeds, the husk of which it has the faculty of breaking

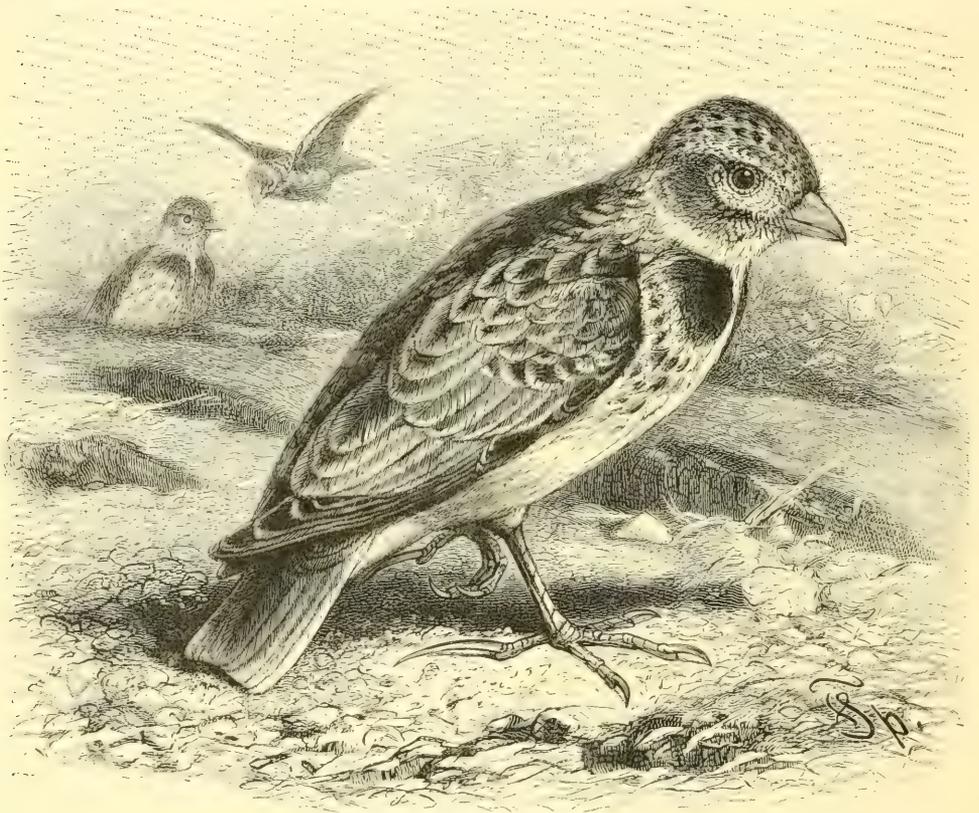


BLACK LARK, WHITE-WINGED LARK, AND SHORT-TOED LARK ($\frac{1}{2}$ nat. size).

in its bill: but we may presume that insects of some sort are supplied to the young. On the ground this lark runs quickly, and it is especially fond of grovelling in sand. When at large, it never perches on shrubs or bushes, though in confinement, like the skylark, it will readily take to a perch. The cock has a lively song, given on the wing both in the morning and evening, but seldom in the middle of the day. The nest is formed of a few bits of grass collected in a depression of the ground, often a horse's footprint; and the eggs, four or five in number, are of a French white, generally minutely freckled with pale hair-brown. The adult has the upper-parts sandy grey, the feathers having dark centres; the wings and tail are blackish brown, some of the feathers being margined with buff;

the sides of the head are marked with blackish brown, a creamy white stripe extending over and behind the eye; on each side of the upper part of the breast is a blackish brown patch; and the under-parts generally are white washed with buff. Individual specimens vary considerably in tint, some being more rufous or grey than others.

The Calandra Larks. This group comprehends a small assemblage of large, stout-billed larks, characterised by black patches of feathers on each side of the breast. The wing has ten primaries, the first being very minute, and is very long,



CALANDRA LARK ($\frac{1}{2}$ nat. size).

reaching nearly to the tip of the tail; the claw of the first toe being long and straight. This Old World group is chiefly found in Southern Europe, Algeria, Egypt, Nubia, and India; the Eastern representative of the Western bird inhabiting Northern China.

Calandra Lark. The calandra (*Melanocorypha calandra*) is one of the finest of European songsters, which it would be difficult to overpraise, as it would also be difficult to exaggerate the beauty of its glorious song which is full of changes; although individuals vary in the proficiency of their vocal powers. In appearance, it somewhat recalls that of the corn-bunting. It is a heavily-built bird, and somewhat similar to the latter in shape, but it does not dangle its legs in the air when flying. A permanent resident in the south of France and Spain, in

parts of Italy and in Greece, the calandra is common also in Turkey: while many are shot in winter, as they are large, plump birds, and much in request for eating. Mr. G. F. Mathew states that "the male on commencing his song springs from the ground, and with a graceful undulating motion describes a series of large circles until he rises to an immense height; his song is then clear and beautiful, but at close quarters it is piercing and unpleasant. The call-note is loud and harsh, and somewhat similar to that of the corn-bunting. With the Portuguese it is a favourite cage-bird, and in many of the streets of Lisbon may be seen hanging outside every door in cages. At Gibraltar it is frequent, and many are caught on the neutral ground by bird-catchers who use clap-nets with decoy call-birds." The calandra lark makes its nest in a depression of the ground, often at a depth of three or four inches. The nest is a careless structure built of grass stems. The eggs are dull grey in ground-colour, blotched with brown and pale amber, with underlying markings of grey and light brown. The adult is greyish brown above, the feathers having dark centres; the under surface of the body is white tinged with fulvous, and streaked finely with dark brown. The distinguishing character of this species is a large patch of black adorning the sides of the neck.

Black Lark.

This species (*M. yeltoniensis*), which is figured on p. 423, inhabits the steppes of Central Asia, migrating westward into Southern Russia in the autumn and winter. After rearing their progeny, these larks congregate, especially in August, and wander over the brackish places of the desert throughout the whole autumn, especially in the region of the salt-lake Yelton. In the middle of winter, when the snow covers the land, they approach the towns and suburbs.

In summer, when on the ground, the black lark emits a feeble piping, generally singing from a hillock, but its song is not powerful. Its nest is merely a slight hollow in the ground, lined with a few vegetable fibres, moss, and dried grass. The female lays four eggs, bluish in colour, and spotted with yellow; these being deposited from the end of April till the end of July. In plumage, the black lark varies at different seasons; in spring, the entire plumage of the male being black, with the feathers of the back, rump, and breast, edged with light sandy, but these markings become almost completely obsolete in the height of summer. The general colour of the female is sandy brown, the lores and superciliary stripe being whitish, the wings and tail dark brown, edged with sandy; the under surface of the body white tinged with buff; the upper part of the breast mottled with brown; and the flanks striated.

**White-Winged
Lark.**

This Siberian lark (*M. sibirica*) has only once or twice wandered into Western Europe; its home being in the steppes of Eastern Russia, whence it extends eastward as far as the Yenesei. It has once occurred in Great Britain, a female having been captured near Brighton in 1869, whilst consorting with a flock of snow-buntings; and it has likewise been obtained in Belgium and Western Germany. Arriving on its breeding-grounds in Russia in the spring much later than the skylark, it affects grassy and open districts; and when singing, often soars aloft, but does not ascend so high as the skylark. It pairs about the middle of May, and builds its nest of grass upon the ground. The eggs, four or more in number, are greyish white, closely marked with dull brown. The adult male

in summer-plumage has the upper-parts rich brown, bordered with russet, becoming lighter on the nape; the crown, lesser wing-coverts and upper tail-coverts being a brilliant red-russet, which gives the bird a marked and distinct character; the primaries are dark brown, the first white on the inner web, and becoming almost entirely so in the middle; the tail-feathers are brown edged with white on the inner webs; the throat and sides of the neck are spotted with brown and russet; and the under-parts are white. The female is similar, but duller and less pure in tint.

The Horned Larks. The horned larks are distinguished in the adult male plumage by a tuft of feathers springing from each side of the crown; the bill being rather short, and slightly arched; the nostrils are densely covered by plumes, the



HORNED, OR SHORE LARK ($\frac{1}{2}$ nat. size).

wings are long, and the claw of the first toe is straight and about as long as the toe. These birds are remarkable for the constancy of the pattern of their plumage: yellow and black being usually associated with vinaceous brown. This genus (*Otocorys*) is strongly represented in the New World, the northern parts of which possess several species, one of the number at least being virtually identical with the common horned lark of Europe. The latter bird (*O. alpestris*) appears to inhabit the whole of the northern parts of Europe and Siberia; and other species are

found in the Himalaya and adjoining plateaus, two of the number being peculiar to very high altitudes; Mr. Blanford having met with Elwes' horned lark in Sikhim at nearly eighteen thousand feet elevation.

The horned lark breeds on the fjelds and tundras of Northern Europe, extending southwards into Central Norway. Formerly it was regarded as a rare straggler to the coast of Great Britain, but it is now known that considerable numbers of these birds annually cross the North Sea to winter upon the eastern shores of England. Certain spots are frequented by these birds year after year, where they feed chiefly on the seeds of marine plants. For many years the horned shore-larks that visited Britain proved to be males almost exclusively; but females have latterly been taken in considerable numbers, although not in the same proportion as the males. The shore-larks, which winter on the British coast, rarely wander inland, although they sometimes migrate across England from the Yorkshire coast to that of Lancashire. They arrive during the last months of the year, and remain until the end of February, or even the middle of March. Mr. Seeböhm writes that "the shore-lark is as much a bird of the tundra as the snow-bunting and the Lapland bunting, but it breeds at a lower latitude than the former species, and is almost as abundant as the latter is more local. It avoids the marshy districts, and confines itself to dry sandy plains or rocky hills, though it comes down to the mud-shores of the rivers to drink. It is one of the earliest of the small birds to arrive at its breeding-grounds. The snow-bunting and the mealy redpoll arrive first, and may be seen running about on the snow some weeks before the ice breaks up; but as soon as the thaw begins in earnest a batch of small birds arrives, among which is sure to be the shore-lark . . . During migration the shore-lark is a gregarious bird, and though the first flocks consisted of shore-larks only, as soon as the Lapland buntings began to arrive, they seemed to be on the best of terms together, and the later flocks usually consisted of both species. Flocks of pipits were migrating about the same time, and it was very striking to contrast the wildness of these birds with the tameness of the shore-larks. The shore-lark often sings on the ground, and when apparently too busy feeding to mount in the air for the purpose, will occasionally utter snatches of song. At their breeding-places they sing continually, mounting up into the air like a skylark, and singing their charming song as they sail about with wings and tail expanded. The song is very melodious though short; and among its few variations a long drawn-out note often occurs, which resembles much the song of the corn-bunting. It often remains some time in the air and sings its little song several times over before it descends. It will also sing from the roof of the wooden houses. Its call-note is loud and clear, but scarcely capable of being expressed by a word. In Lapland, the shore-lark lays its eggs from the middle of May to the middle of June, but in Siberia not before the latter date. The nest is always built on the ground, generally in some slight hollow. I found one in Finmark in the middle of a mountain-pass, in the hollow formed by the foot of a horse in the soft mud which the sun had afterwards hardened. Others were amongst stones on the bare ground, and one under the shelter of some rushes in the grass. The nest is loosely made of dry grass and stalks; and the inside, which is rather deep, is lined with willow down or reindeer hair. Four is the usual

number of eggs, but very often only three are laid, and sometimes as many as five. They may be said to be characteristic larks' eggs, and only differ from those of the skylark by their more olive shade of colour. The ground-colour is a pale greenish or pale brownish white, often so coloured by the profusion of markings as to be scarcely visible. The overlying spots are small and irregular in shape, of an almost neutral brown colour, and nearly conceal the paler and greyer underlying spots." The adult male shore-lark in breeding-plumage has the forehead, and a stripe over each eye, the chin, and upper throat pale yellow; the crown, and tufts of the head, the lores, and a band across the lower neck are black; the upper-parts are vinaceous brown, and the under-parts dirty white. The female is similar, but all her colours are duller, a remark which applies to the bird of the year. In winter-plumage the shore-lark lacks the ruddy vinaceous tinting characterising the breeding-plumage. The intensity of the latter is obtained by a change in the actual colour of the feather itself, and is not produced by a moult. The young have the whole of the upper plumage dark brown spotted with dull yellow; the throat being pale yellow streaked with black; the lower-parts are dull white.

WAGTAILS AND PIPITS.

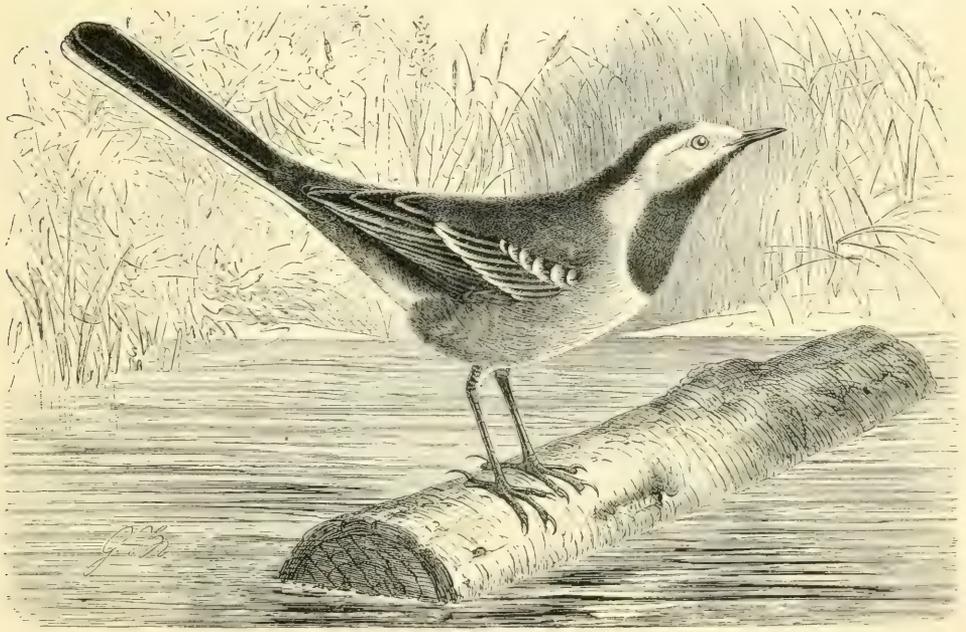
Family *MOTACILLIDÆ*.

The members of this family are a group of slender-bodied birds, possessing among their common features a slender bill adapted to an insectivorous diet, a wing composed of nine primaries, long slender feet, and a long tail generally about equal in length to the wing. The wagtails are distinguished from the pipits by their proportionate longer tails; and also by their gay colours, in which yellow usually predominates; they are migratory, and perform long and arduous journeys to and from their breeding-grounds. The wagtails and pipits are chiefly inhabitants of the Old World, especially the northern portions of Europe and Asia, being represented in North America by two species found in Alaska, but not in the eastern portions of that Continent.

The Wagtails. The white wagtail and its congeners are small, elegantly-shaped birds; all in the habit of running over grass in pursuit of insects. The bill is slender, nearly straight, and very slightly notched at the tip; while the wings are moderate, the first three primaries being about equal and longest, and the inner secondaries very long; the tail consists of twelve long narrow feathers; and the metatarsus is long and slender. The white wagtail is found throughout Northern Europe, extending as far East as the Yenesei, and wintering in North Africa; while an allied species is found in Persia; a third breeding in Northern China, and wintering in Burma. Seven species of the genus *Motacilla* are found in South Africa; while no fewer than thirteen visit India during the winter season, at least one of these being a permanent resident in that country.

The White Wagtail. The white wagtail (*M. alba*) is a common summer visitor to the northern and central portions of Europe, delighting in public parks and gardens, where it may be seen running at the roadside in pursuit of its insect prey. In Portugal its provincial name signifies "washerwoman," the

analogy having been suggested by the habits of the rural laundresses, who, wading into the streams, cleanse the clothes on a stone. It is partial to the neighbourhood of old buildings and outhouses, and often nests in such situations; and in Switzerland it seeks the mountain-chalets and cow-sheds, in search of the insects to be found in the neighbourhood of domestic animals. The nest of this wagtail may be either among the roots of a tree, or in a bank by the riverside, or occasionally on a shelf in some outbuildings. Mr. Seebohm says that, in Siberia, the white wagtail is one of the first of the soft-billed birds to arrive on the Arctic Circle in any numbers. This wagtail nests two or three times in the season, rearing four or five young ones in a brood; the nest being built of dry stems of grass, moss, and fibres, closely worked together and neatly lined with wool, hair, and often feathers. The eggs



THE WHITE WAGTAIL ($\frac{2}{3}$ nat. size).

are white in ground-colour, spotted and speckled with greyish brown. When the young leave the nest, they live for some weeks with their parents, haunting garden-lawns and meadow-lands in search of food. The flight of the white wagtail is rapid and undulating. The call-note is loud and sibilant, and the song somewhat pleasing, although far from powerful. The white wagtail sometimes migrates in large parties, and is fond of roosting in the cover supplied by aquatic reeds. All the movements of this bird are elegant and rapid, perhaps even more so than those of the closely-allied pied wagtail (*M. lugubris*), so well-known in the British Islands as a summer visitor. White varieties of this wagtail are occasionally seen, in which the characteristic pattern of plumage had become almost obsolete. The adult male in the breeding-season has the forehead and sides of the head pure white, the crown, back of the head, and nape jetty black; the back, rump, and upper tail-coverts pure pearl grey: the primaries and wing-coverts

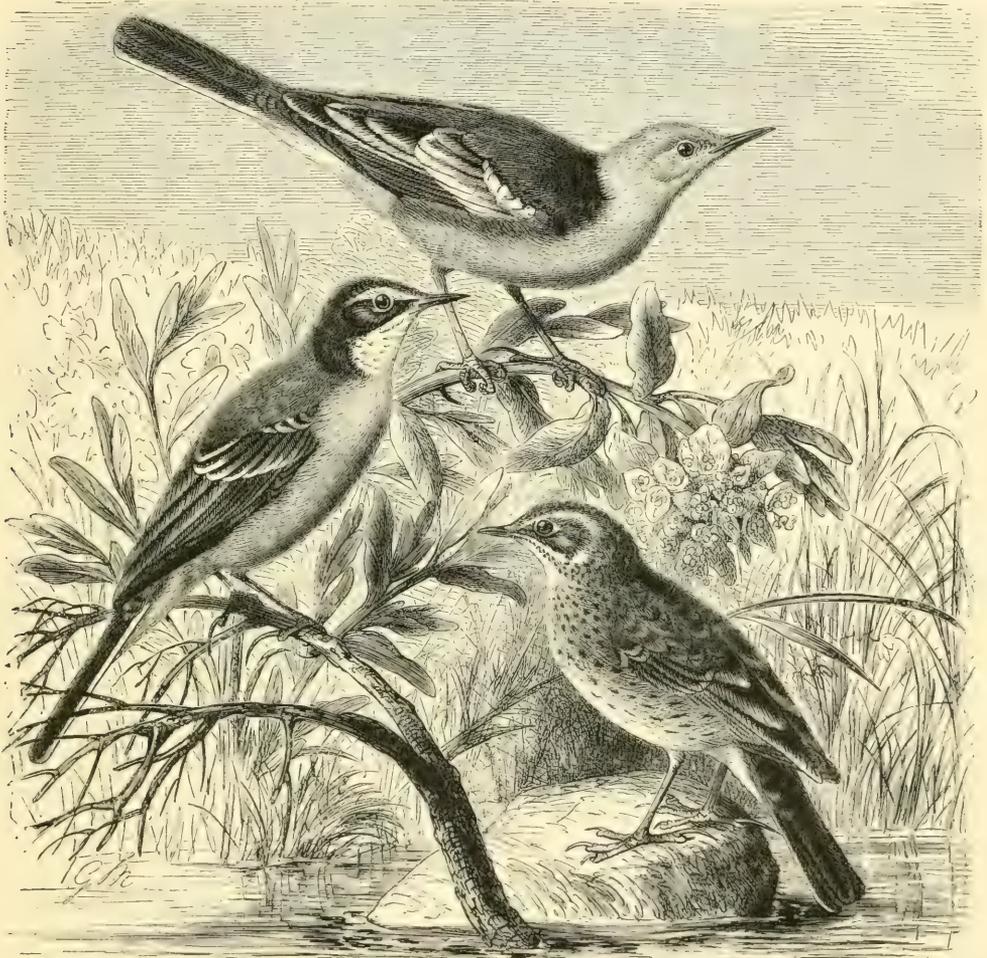
dusky black, edged with greyish white; the tail black and white; the chin and throat black; and the lower-parts pure white.

Yellow-Headed Wagtails. The yellow-headed wagtail (*M. citreola*) is a native of Siberia and Eastern Russia, wintering in most parts of the Indian Empire, and apparently finding its westward summer limits in the valleys of the Petchora and Volga. It breeds in Kashmir, where the nests are placed under clods in the ploughed fields. The proper home of this beautiful bird is, however, amongst the dreary tundras of the far north; Mr. Seebohm having observed it perching on alder-bushes in the neighbourhood of flooded land on the banks of the Petchora. There it breeds in June, and its habits resemble those of other yellow wagtails, its light dainty form assimilating closely to that of the blue-headed and yellow wagtails. The adult male in summer has the entire head and neck deep yellow, as are the under-parts; the upper plumage being ashy grey tinged with bluish.

Grey Wagtail. The species which haunts the streams and mountain torrents of Central Europe is the grey wagtail (*M. melanope*). A common summer visitant and partial resident in the British Isles, shunning the neighbourhood of sluggish, turbid rivers, and delighting in tiny cascades and rippling waterfalls, the grey wagtail is fond of wading daintily in the shallows of a stream, and running over the rocks rising out of the bed. Never found at any distance from water, the nest is placed in a variety of situations, often in the recesses of some loose stone wall, or mossy shelf of rock overhanging running water; while a hole in a wooden bridge is occasionally selected. Nesting year after year in the same place, the grey wagtail is a very early breeder, full complements of eggs being laid early in April; and it breeds twice in a season, the second brood being generally fully fledged about the middle of July. The nest is built of dry stems of grass and a few roots, usually lined with horsehair; six eggs being laid in a clutch, which are white in ground-colour, suffused with pale brown or olive. The grey wagtail has a pretty little song, often uttered from the top of some willow or other riverside tree; the males are very jealous, each choosing his own territory from which every intruder is ousted. Even when the first broods of young are already fledged, and actively searching for food in company with their parents, the old cocks are always on their guard against the possible intrusion of a stranger, whose approach is invariably heralded with a challenge to combat. During its migrations the grey wagtail visits many low-lying districts far remote from its haunts by rocky rivers, occurring near London every winter. This wagtail bears confinement well, and has been known to pair with the pied wagtail in captivity and produce hybrid young. The adult male in summer has the crown and upper-parts slaty grey, the upper tail-coverts greenish yellow, a white stripe passing above the eye and another beneath the lore; the chin and throat are black, and the lower-parts bright yellow. In winter the chin and throat are dirty white, the breast dull buff, and the under-parts greyish white tinged with yellow.

Blue-Headed Wagtails. One of the prettiest of all the wagtails is the blue-headed species (*M. flava*), well known in most parts of Europe, though but a chance summer visitor to the British Islands. In Holland, on the other hand, the present species is of general distribution, though most numerous on the banks of streams and in the neighbourhood of morasses. Its flight is swift, graceful, and undulating,

often accompanied by a cheery call-note which can be heard at a considerable distance. Sometimes it frequents gravelly islets like the grey wagtail, but this is rather the exception than the rule, since the bird prefers the environs of sluggish rivers and the banks of canals to more rapid streams. The blue-headed wagtail nests in meadow-lands, generally in a tuft of grass or a tussock of rushes, but sometimes a number of pairs nest together in a single field. The nest is built of



YELLOW-HEADED WAGTAIL, BLUE-HEADED WAGTAIL, AND MEADOW-PIPIT ($\frac{1}{2}$ nat. size).

dry stems of grass and scraps of moss, lined with fine bents and hair; the eggs being yellowish white in ground-colour, mottled and clouded with pale brown. When the eggs are hatched, the old birds wait eagerly upon their offspring, continuing to watch over their safety long after they are fledged. These birds are exceedingly fond of the neighbourhood of horses, running in and out between the feet of the animals with singular unconcern. The adult male has the upper-parts yellowish green; the forehead, crown and lores, a beautiful slaty blue, set

off to great advantage by the white eyestripe, the under-parts being pure yellow. The female has the crown of the head greenish brown instead of blue, and the eyestripe is less pure; the under-parts being of a duller yellow. A figure of this bird is given on the left side of the woodcut on p. 431.

Cape Wagtail. The European wagtails are replaced as familiar birds in South Africa by several allied species, of which the best known is the Cape wagtail (*M. capensis*). Frequenting the crowded cities no less than the outlying farmhouses, this wagtail is everywhere protected, in recognition of its charming ways. Like their European cousins, these birds consort much with cattle, for the sake of the small flies found about those animals; and they also frequent the sea-beach to procure the flies bred in the putrefying seaweed. The nest is generally constructed in the side of a bank, or a crevice of a stone wall; it is cup-shaped and constructed of dry grass lined with cows' hair and fur. Sometimes it is built under some projecting stone or overhanging root on the bank of a stream. The eggs are brownish cream-colour, freckled with brown. The Cape wagtail has the dipping flight peculiar to the genus, and like other wagtails is fond of seeking its food on the margins of muddy streams; and it has a pretty song, which however is seldom uttered. Sometimes it is seen in flocks, especially when the birds are gathering to roost in some favourite tree; at other times it lives chiefly in pairs, preying upon insects, which it takes both upon the ground and on the wing. The adult male has the head and hind-neck ashy grey, the eyestripe, cheeks, and throat white, the upper-parts brown, washed with olive, the tail-feathers blackish brown, with the exception of the outer feathers which are chiefly white; a black crescentic band crosses the neck, and the breast and under-parts are yellowish white, and the sides of the body brown.

Pipits. The pipits of the genus *Anthus* form a large group of plain-coloured birds, characterised by the possession of a slender bill very slightly notched at the tip. The legs are proportionately slender and generally adapted for terrestrial progression; the wings are moderate in length, but the tail is comparatively short, and often slightly forked. Unlike the larks, the pipits have the nostrils unprotected by feathers; but in certain species the first toe is much elongated. Practically cosmopolitan in their distribution, pipits are represented in all parts of the world except the islands of the South Pacific; they are, however, really an Old World race, since only two, out of a total of some forty known species, are inhabitants of North America.

Tree-Pipit. Even in Northern Europe, the tree-pipit (*A. arboreus*) is a fairly well-known bird, but its favourite haunts are the mild climate of the British Isles and Central Europe; and it shuns high and barren regions, preferring the shelter of well-timbered valleys and the undulating hollows of English parks. All the pipits are quarrelsome and fond of fighting individuals of their own kind; and on one occasion we observed a tree-pipit chase another of the same species against the side of an hotel in Switzerland, the pursuer following up the chase with such energy that he was unable to check his course, and, dashing against the window, dropped stunned on the ground. Another time a tree-pipit chose to take up his abode in a small garden which was also a favourite hunting-ground of a robin, and although the fight was sharp the robin was eventually vanquished.

The tree-pipits migrate in flocks, and in the spring the birds soon pair, when each couple selects its own area of breeding-ground. The song is melodious, its notes bearing a strong resemblance to those of the canary. Sometimes this pipit sings upon the ground, threading its way furtively through the stems of the hay crop, pouring forth in snatches a volume of melody. Oftener the song is uttered while the bird is perching on one of the larger branches of a tall tree by the roadside, or when on the wing. Mr. Seebohm writes, that it is a pretty sight in early spring to watch the tree-pipit essaying his short flights, as he "springs up from the topmost twig of some branch, and mounts nearly perpendicularly into the air warbling his pretty song. He soon begins to hover in the air, and, as if fatigued by his recent journey, almost immediately descends with tail and wings extended like a parachute, and at last finishes his song on the ground, in a tree, or on a wall. His downward course is in a semi-spiral curve, and he alights where the curve of his flight would make a tangent to the surface of the ground. All this time he has been singing melodiously, the clear, rich, joyous notes following each other in rapid succession, until, as he reaches his perch, he concludes his song with several long-drawn notes expressive of almost impatient anxiety." The tree-pipit nests upon the ground, often upon a bank skirting the edge of a wood; the nest being always well concealed, and built of dry stems of grass and moss, lined with fine bents and hair. At times several pairs nest on a single strip of moorland, although this is unusual. The eggs vary greatly in colour, but the most usual type has the ground-colour white, so closely suffused with deep brown as to be almost entirely of the latter colour. The young birds leave the nest early and soon become independent of their parents. In autumn these birds flock together, and many are captured by the bird-catchers. The upper-parts of the tree-pipit are brown, the feathers having dark centres, and the lower parts buffish white, profusely spotted with dark brown.

Meadow-Pipit.

Upon the waste moorlands of Western Europe the meadow-pipit (*A. pratensis*), figured in the illustration on p. 431, generally replaces the tree-pipit, and finds a congenial abode among peat-bogs and dreary wastes only redeemed from ugliness by large strips of cotton-grass. A partial resident in most of its haunts, many individuals, merely shifting from the higher grounds to the plains before the arrival of winter, the meadow-pipit loves rough marshy ground and treeless wastes of heather, rearing its young in the most remote and forbidding solitudes. Although its song is inferior in compass to that of the tree-pipit, it is chanted on the wing. The meadow-pipit nests on rough ground and undrained meadows, building a slight nest of dried stems of grass, often in a tussock of herbage, sometimes a very little above the tide-mark on the sea-beach. The eggs are white in ground-colour, closely mottled with brown or brownish grey. The cuckoo is exceedingly fond of depositing her eggs in the meadow-pipit's nest; and it is diverting to watch a pair of these birds endeavouring to oust one of these undesirable neighbours from their vicinity. It is often assumed that the cuckoo finds a willing dupe in the meadow-pipit, but such is not the case in actual fact. When the cuckoos first arrive in England, and commence to pair and lay, the meadow-pipits assail the strangers with persistency, not only mobbing them with angry cries, but also using physical means to enforce their opinions;

the small birds not hesitating to alight upon the back of the cuckoo. As soon, however, as the young cuckoo has become the sole object of the charge of the pipits, the latter accept the situation with admirable fortitude, working early and late to satisfy the hungry maw of their foster-child. The meadow-pipit is very subject to a variation of plumage, especially when young; one of the prettiest varieties being of a buff canary-yellow throughout, and we have seen others



RICHARD'S PIPIT, WATER-PIPIT, AND TAWNY PIPIT ($\frac{2}{3}$ nat. size).

pied with white. A small pale race is found in Madeira. The meadow-pipit is olive-brown above, with dark centres to the feathers, often tinged with olive green; the under-parts being buffish white, thickly streaked with dark brown.

A large species of pipit, known as Richard's pipit (*A. richardi*), breeds in North Siberia, whence stragglers often wander to Britain during the autumn and winter. Mr. Seebohm states that he found this pipit exceedingly abundant in the meadows on the banks of the Yenesei near Yenesaisk. The country is almost a dead flat for miles, and is intersected with half dried-up

river-beds, and chains of swampy lakes, full of tall sedges and reeds and water-plants of various kinds, and half-concealed by willow-bushes and alders, whilst far away in the distance the horizon is bounded on every side by the forest. These oases of grass in the boundless forest are the paradise of Richard's pipit. As I wandered away from the town this bird became more common. I found it difficult to shoot them on the ground, as they ran about on the grass; but I soon obtained as many examples as I wanted, as they hovered in the air almost like the kestrel. . . . Dybowski found them equally common on the plateaus near Lake Baikal, at an elevation of five thousand feet above the level of the sea. They arrive about the middle of May, and build their nests upon the ground in the grass. They usually choose a hollow in the meadows, such as the footprint in the soft earth of a cow or a horse. The first nest is made in the first half of June, and frequently a second brood is reared, the eggs being laid in the second half of July. The nests are said to be very difficult to find. The male keeps watch, and, on the approach of danger, he gives the alarm to the female, who leaves the nest and runs along the ground for some distance, when she rises and joins the male in endeavouring to entice the intruder from the nest with anxious cries. If their little manœuvres are successful, the female drops to the ground and runs back to the nest through the grass. In this district the nest of Richard's pipit is the one usually selected by the cuckoo in which to deposit her eggs. They leave for their winter quarters late in September." The eggs vary in number, from four to six; some are profusely spotted all over with minute specks and blotches of greenish brown upon a pale greenish white ground-colour, whilst in others the spots are reddish brown upon a pinkish white ground-colour. The adult male has the upper-parts nearly uniform brown, beneath buffish white darkest on the breast, which is streaked with dark brown. The sexes are identical. Richard's pipit may always be known by the long metatarsus and greatly developed claw of the first toe. A figure of this bird, as well as of the tawny pipit, is given in the woodcut on p. 434.

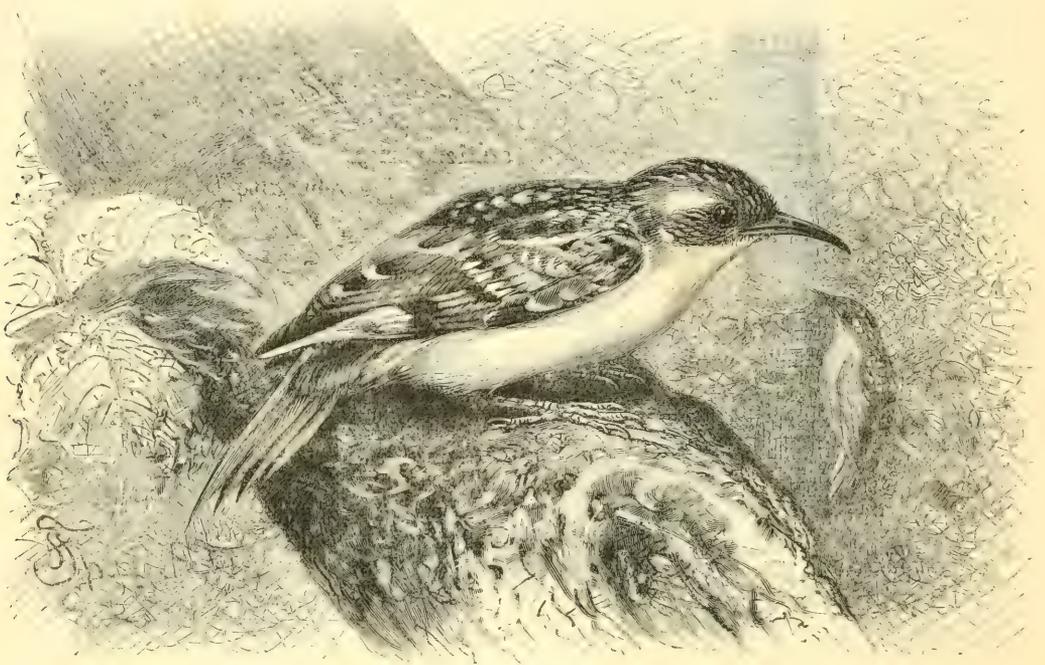
Tawny Pipit. The haunts of the tawny pipit (*A. campestris*) are chiefly in desert-regions, at least through a large portion of its range. In Europe it is chiefly known as a summer visitor to certain favoured districts, such as the sierras of Spain and Portugal, the sand-dunes of the Baltic coast-line, and sparingly on high ground in Central France. It is a shy and wary species, even on the breeding-ground. Mr. Seebohm found it very common in Greece, where it is the only pipit that nests. It there prefers the open plains, being especially common on the undulating prairie country, half rock and half grass and heath, between Athens and Marathon. It runs on the ground with great agility, and has a restless zigzag flight, which appears less undulating than that of the meadow-pipit. The nest, according to Mr. Seebohm, "is sometimes under a bush, sometimes beneath a tuft of dense herbage, or under the shelter of a clod of earth; at others in the open plain amongst the growing crops, and often near a dried-up streamlet on a bank beside a convenient stone. It is made of dry grass, often intermixed with a few stems of coarse herbage or straws, together with roots, and lined with horsehair." The eggs are white in ground-colour, profusely spotted with reddish brown and underlying spots of grey. The tawny pipit migrates from its breeding-ground in August, at which season it has occa-

sionally been captured in the British Isles and on Heligoland. The adult male is nearly uniform brown above; the wings and tail being conspicuously edged with buff, while the chin is buffy white, and the lower-parts buffish, slightly streaked with brown upon the breast.

THE CREEPERS.

Family *CERTHIDÆ*.

The creepers bring us to a small group of birds modified to pursue their prey (comprising spiders and insects) upon the surface of cliffs or the trunks of trees; the best known forms being small and plain-coloured birds, typified by the common



THE TREE-CREEPER.

European tree-creeper (*Certhia familiaris*). All have the beak relatively long, slender, sharp, and curving downwards; the wings including ten primaries, and the tail consisting of twelve stout and pointed feathers, which are often stiffened to aid climbing. The claws are long and curved, and the metatarsus is scutellated.

Some divergence of view obtains among ornithologists as to the limits and serial position of the family. Dr. Sharpe, for instance, who places it near the wagtails and pipits, would include in this family the nuthatches; while, on the other hand, Mr. Oates excludes the latter and includes the wrens within its limits, placing the family between the drongos and the warblers. Employing the term in the original more restricted sense, the *Certhiidae* are widely spread over the northern regions of both the Eastern and Western Hemispheres; several species also inhabiting the Indian region, while others are peculiar to Australia.

Passing by the tree-creepers (*Certhia*), in which the tail is composed of stiff feathers, and also the Indian spotted-grey creeper (*Salpornis*), remarkable for building an open cup-shaped nest upon a branch, and in which the tail-feathers are soft, we select for special notice the wall-creeper.

Wall-Creeper. The beautiful creeper (*Tichodroma muraria*), which alone represents the genus, passes its entire existence in traversing the surfaces of precipices in pursuit of the spiders and flies constituting its food.



THE WALL-CREEPER ($\frac{1}{2}$ nat. size).

Hence the bill is long, slender, and almost straight, adapted for probing interstices and cracks, such as usually constitute the haunts of its prey. The wing is large and rounded, like that of a butterfly, thus affording an easy support as the bird half flies, half flits about the mural precipices in which it makes its home: the tail is slightly rounded, and composed of twelve feathers: the metatarsus is smooth, and the claws are sharp and curved. Residing in the mountain-ranges of Europe, and ranging eastwards into Central Asia, the wall-creeper is found throughout the

Himalaya, although only as a winter visitor. During the summer months it makes its home among precipitous rocks, either in rugged ravines or upon the faces of cliffs. The flight of this bird almost recalls that of a large butterfly, as it makes its way from one crevice to another, hanging momentarily with expanded wings in one spot, thence shuffling upwards for a foot or two, and then suddenly darting off to explore another corner of the rocks, ever in restless motion, save when it creeps to roost in some secure fissure. The wall-creeper nests from April till June, depositing four or five pure white eggs, sparsely speckled with red, in a nest built of straw, grass, and moss, intermingled with wool and feathers.

The Australian Straight-Claws. Certain somewhat remarkable Australian birds, placed by Gould among the present family, may be conveniently noticed here, although their serial position is open to considerable doubt, and they are placed by Dr. Sharpe with the *Crateropodidæ*. The genus, of which there are several species, such as the spiny-tailed (*Orthonyx spinicauda*), and yellow-headed straight-claw (*O. ochrocephalus*), is characterised by the short and straight beak, in which the culmen is arched, the moderate and rounded wings, with the first four quills graduated and shorter than the fifth, and the long tail, in which the feathers are broad, and furnished with soft webs, but with stiff, rigid shafts, terminating in naked points. The feet are very large and strong. Inhabiting South and Eastern Australia, the common species frequents remote situations in the bush, rapidly traversing the surface of moss-covered stones and the fallen trunks of trees in search of food. It never climbs, and is solitary in its habits, seldom more than two being seen together. Its oft-repeated cry of *cri, cri, cri, crite*, betrays its presence, when its native haunts, the most retired forests, are visited. Its food consists of insects and wood-bugs. The eggs are white and large in proportion to the size of the bird. The situation of the nest is the side of a slanting rock, the entrance being level with the surface. The adult male has the head and upper-parts reddish brown; the wings are brown, the coverts largely tipped with grey; the primaries are crossed with grey at the base; the tips of the secondaries are tipped with dark brownish grey; the tail is dark brown; the sides of the head and neck are dark grey; the throat and chest white, separated from the grey of the sides of the neck by a lunar-shaped mark of deep black; and the flanks and under tail-coverts grey, stained with reddish brown. The female differs from her mate, in having the throat rich rusty red instead of white.

THE NUTHATCHES.

Family *SITTIDÆ*.

Regarded by Dr. Sharpe as inseparable from the creepers, the nuthatches are retained as a distinct family by Mr. Oates, who considers them to be most nearly related to the *Crateropodidæ*. These birds have the edges of both mandibles smooth, or the upper one slightly notched; the hinder surface of the metatarsus is smooth, and covered with two entire longitudinal plates; the wing has ten primaries; the nostrils are clear of the line of the forehead, and overhung by some

hairs; bristles are present at the rictus of the gape; there are twelve tail-feathers; and the first and second toes are of very unequal lengths. In all the group there is but one annual moult, and the plumage of the nestling resembles that of the female; while in most cases the coloration of the plumage is different in the two sexes. With the exception of South America and Africa south of the Sahara, nuthatches are pretty generally distributed, extending to Australasia. They are small climbing birds, with the first toe greatly developed, and the second proportionately shortened; and feed both on insects and nuts. Resident in their habits, they nest in the holes of trees or the crevices of rocks, very generally reducing the size of the aperture of the hole by building it up with mud. In addition to the type genus, the family is represented by the Australian genus *Sitella*, and likewise by a third known as *Hypositta*.

Common Nuthatch. Abundant in many parts of Central and Southern Europe, as it is in England, in the spring of the year the common nuthatch (*Sitta casia*) invariably indicates its whereabouts by its merry call-note, which rings far and wide through the beech woods, which the bird chiefly frequents. The nuthatch pairs at the close of winter, and chooses for its nesting-site a hole in some hollow tree, plastering up the entrance with clay, and only leaving a small orifice through which the birds pass into the nest; the interior of the nest being lined with dry beech leaves. The eggs are white, spotted with bright red; and, when the young are fledged, they live for a time with their parents, but soon become independent, and rove through the woods in company with tits and other small birds.



NUTHATCH.

If a nuthatch be watched, it will be found that it sometimes perches across a bough like any little singing bird; but when feeding it generally runs up and down the trunk of old trees something like a woodpecker. The call-note of the nuthatch is a loud *twet twet*, which may be compared to the words *fetch it, fetch it*, but this cry must not be confused with the spring whistle of the male. If encouraged, it becomes a tame and confiding bird, laying aside much of its fear of man, and readily learning to avail itself of the resources of civilisation. In winter, especially, the nuthatch approaches dwelling-houses, and willingly partakes of scraps of food with tits. During the summer it feeds chiefly upon insects, but in autumn subsists more upon nuts and beech-mast. Few sights are prettier than to watch a nuthatch opening nuts: the bird swinging its body freely forward as it brings down its long bill with accuracy on the right part of the shell.

Nuthatches have rather a habit of entering houses through open windows, probably out of curiosity; and we owed to this habit a pet nuthatch, which became extremely tame, and used to take flies from our finger. They are decidedly pugnacious, and if two males are placed in the same cage in the breeding-season, the probability is that the stronger bird will kill his rival. The devotion which paired birds show to one another is a marked trait in the character of the nuthatch. Once we saw a great deal of a pair of nuthatches which used to flit about the apple-trees in a garden at Montreux; and we noticed the fearless way in which they foraged for food amongst the dead leaves, often approaching close to us with imperturbable confidence. The adult male has the upper-parts slaty blue: a black line passes from the base of the bill through the eye to the nape: the wings and tail are slaty blue, the outer tail-feathers showing, when open, white edges; the flanks are bright chestnut-red; and the lower-parts buffy white. A variety with a black throat and crown has been recorded.

The Syrian nuthatch (*S. neumayeri*) might more properly be called the rock-nuthatch, for its habits in Southern Europe differ in a very remarkable way from those of its congeners; this nuthatch building its nest of earth, small stones, etc., and placing it upon the face of a rock, and constructing a round, funnel-shaped entrance, an inch or more in length. Mr. Seebohm, who found this nuthatch building in the crags near Smyrna, gives the following account of its nidification:—"The nest of this bird is a very curious structure. A recess in the rock is selected, and a funnel made of mud and little bits of dry grass is built in front of it. It is quite an important affair; the base is frequently twenty-four inches in circumference, and the walls vary in thickness from half an inch to an inch and a half. The tube of the funnel, which, of course, serves for the ingress and egress of the bird, is about four inches long, with an internal diameter of an inch and a quarter at the entrance. The outside of the nest is carefully made to resemble the appearance of the rock against which it is built. One which I brought home with me is curiously corrugated or granulated, to imitate the calcareous deposits on the inside of the cave where I found it. The nest is warmly lined with goats' wool, thistledown, and all sorts of soft materials. As might be expected in a bird which remains in its summer home during the winter, it is an early breeder, laying its eggs about the middle of April; and it would not appear to breed a second time in the year, as all the nests I found in June were empty. The number of eggs varies from six to ten. They are very beautiful, well marked, and unlike any other egg with which I am acquainted. The typical egg is about the size of that of the wryneck, but rather wider and flatter at the top and straighter at the sides. It has the same pearly-white ground colour, spotted with large rust-coloured blotches." This nuthatch seems to confine itself entirely to rocks, and never alights on the trunk of a tree. The adult male has the entire upper-parts leaden blue; a black stripe passes through the eye; the quills are bluish brown, edged with russet; the tail is blackish brown, with the outer feathers tipped with russet; and the throat and lower-parts are white, tinged with russet on the flanks and abdomen.

One of the most abundant of the nuthatches of North America is the widely distributed pigmy nuthatch (*S. pygmaea*), which roams

Pigmy Nuthatch.

through the woods in flocks composed of its own kind, occasionally joining company with tits and warblers. As many as twenty or thirty may sometimes be seen together, calling incessantly to one another. They feed partly upon the tiny insects which they find lurking in the crevices of the tree-bark, partly upon the seeds of fir-trees. Their notes are very varied. The eggs of this nuthatch are deposited in the hole of a tree, which is sometimes lined and sometimes left bare; the eggs being pinkish white dotted with reddish. The young birds leave the nest in the month of June. Mr. Trippe furnishes the following notice of this bird, which he found breeding up to an elevation of eight thousand five hundred feet in Colorado:—"The pigmy nuthatch is a delicate little fellow, with more of the habits and voice of *S. canadensis* than of the white-breasted species; a similarity carried out by the coloration of the tail, and their half warbler-like movements at times. They are very active and incessantly on the move, creeping over the trunks and limbs of the pines, and tapping vigorously here and there like a woodpecker, and far louder than the other nuthatches do." The adult bird has the upper-parts ashy blue; the top of the head and sides to below the eyes olive-brown bordered with black; the tail-feathers are blackish spotted with white, except the two central ones, which are blue; and the under-parts vary from buffish white to a rich rusty colour.

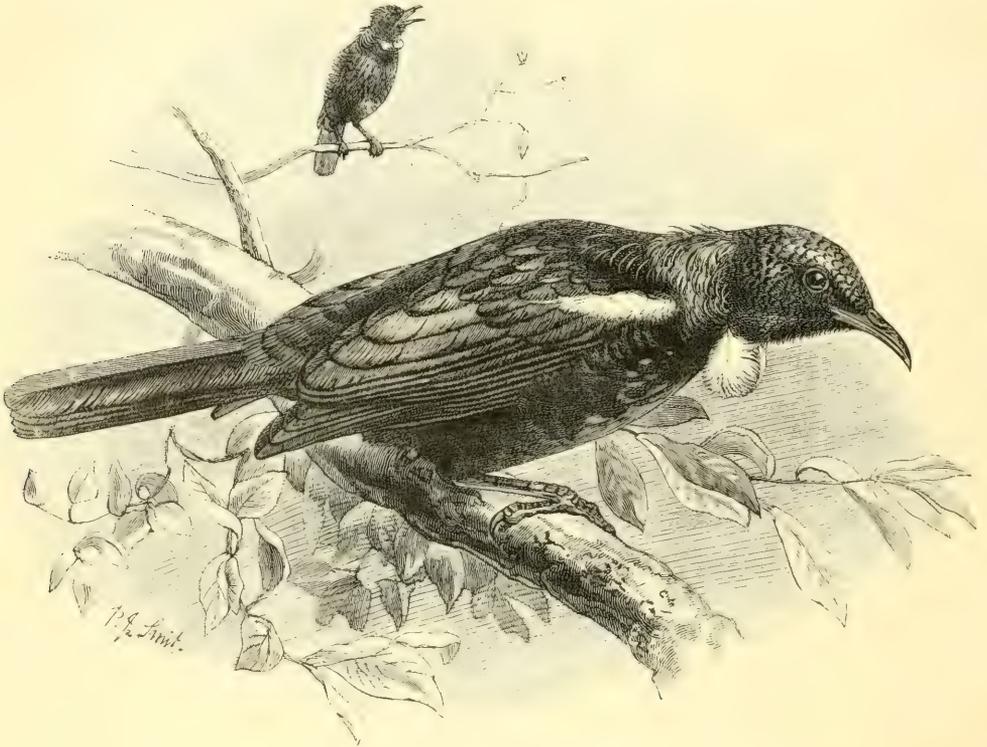
THE HONEY-EATERS.

Family *MELIPHAGIDÆ*.

Distinguished from all the families hitherto noticed by their long extensile tongue, adapted for extracting the honey upon which they subsist from the flowers of gum-trees and other trees of the Australasian forests, the honey-eaters form a large and interesting group. In all, the beak is long and slender, with the upper mandible curved, but there are no bristles at the rictus of the gape; the feet are generally large, and the wings of moderate length. The group is confined to Australasia and the islands of the South Pacific; and although comprising many genera, our space allows of mention of only a few.

Parson Bird. The Poë honey-eater (*Prothemadera nova-zealandia*), commonly known as the parson-bird, has the long, slender, and considerably curved beak, broad at the base, while the tail is long and broad. The sole representative of its genus, this bird is found on both the main islands of New Zealand, where it is one of the most abundant of the indigenous species. Sir Walter Buller writes, that in a state of nature, the tui, or parson-bird, is even more lively and active than in captivity. "It is incessantly on the move, pausing only to utter its joyous notes. The early morning is the period devoted to melody, and the tuis then perform in concert, gladdening the woods with their wild ecstasy. . . . When engaged in song the tui puffs out the feathers of his body, distends his throat, opens wide his beak, with the tongue raised and slightly protruded, and gesticulates with his head, as he pours forth the wild harmony of his soul. A pair may often be observed scarcely a foot apart on the same branch performing in concert, for both sexes sing. The notes are rich and varied, now resembling the striking together of metallic rods, then a long-drawn sigh, a warble, and a sob,

followed by a note of great sweetness like the touch on the high stop of an organ. . . . One of its finest notes is a clear silvery toll followed by a pause, and then another toll; the performance lasting sometimes an hour or more. This is generally heard at the close of the day, or just before the bird betakes itself to roost for the night. I have, however, on one or two occasions heard a sweet *tui* toll long after the shadows of darkness had settled down upon the forests, and all other sounds were hushed. At other times it may be heard uttering a sweet warbling note, followed by a sneeze, after that a pause, then a sharp cry of *tu-whit, tu-whit, ooo*, a pause again, and then its warbling note with variations, very soft and liquid, but



POË HONEY-EATER, OR PARSON-BIRD.

ending abruptly in a sound like the breaking of glass." In confinement the parson-bird readily reproduces the cries of other species. It feeds upon ripe berries, flies, and other insects, and the honey of certain wild blossoms; it builds its nest in the fork of a bushy shrub, generally only a few feet from the ground; it is a large structure, composed chiefly of sprays or dried twigs, intermixed with coarse moss, and lined with fine grasses. The eggs are generally white, finely spotted with red or brown. The parson-bird builds twice in the year, the first nest being found in August. The newly-hatched bird is almost entirely bare, but the feathers soon appear, and the growth of the nestling is rapid. The adult male has the general plumage shining metallic green, with bluish purple reflections on the shoulders, rump, and upper tail-coverts: the middle of the back and the scapulars are bronze-

brown; the primaries and tail-feathers are metallic green; the hind-neck is ornamented with a collar of soft plumes, having a white line down the centre; and the lower part of the breast is metallic green, changing into purplish blue. The sides and abdomen are blackish brown, and the throat is ornamented with two tufts of white filamentous feathers.

Stitch-Bird. This honey-eater (*Pogonornis cincta*) has a moderate bill, much compressed and slender, and the gape furnished with slender bristles; the wings are moderate, with the fourth quill the longest; the tail is moderate and forked; and the metatarsus long, robust, and covered in front with transverse scales. Formerly abundant in the southern parts of the North Island of New Zealand, it was never found in the South Island. The stitch-bird is remarkable for the bright plumage of the male, on which account it has been almost completely exterminated by the natives, in order that the chiefs might wear the canary-yellow feathers from the wings in their gorgeous feather robes. Always a shy and retiring species, and difficult to shoot, the Maoris used to take this bird in snares baited with flowers. Sir W. Buller observes that when disturbed by the report of a gun, this bird will fly off to a neighbouring tree with a light and graceful movement of the wing; but when descending to a lower station it adopts a different manner of flight, elevating the tail almost to a right angle with the body, and scarcely moving the wings at all. The male bird erects the tail and spreads the ear-tufts when excited or alarmed; but the female habitually carries the tail perfectly erect, and the wings drooping. The male utters at short intervals, and with startling energy, a melodious whistling call of three notes; but at other times he produces a sharp, clicking sound, like the striking of two quartz stones together, the sound having a fancied resemblance to the word "stitch." The nest is a slight, shallow structure, built of sprays and fibres, lined with fine grass and cow-hair. The egg is yellowish white, thickly spotted with pale rufous. The adult male has the head, neck, and upper back velvety black; a tuft of snow-white feathers is present on both sides of the head; the wings and tail are black; a band of rich canary-yellow encircles the back neck; and the under-parts are light greyish brown. The female is plain brown.

White-Eyes. The group of honey-sucking birds known as white-eyes (genus *Zosterops*) have long been a bone of contention among ornithologists, Dr. Gadow placing them among the honey-eaters, Dr. Selater with the sun-birds, Mr. Wallace among the flower-peckers, and Mr. Oates in the *Crateropodidae*, while Professor Mivart makes them the type of a family by themselves. Under these circumstances we have placed them here, preferring to leave their family position open. They are characterised by having the beak curved, slender, and pointed, and the nostrils covered by a large membrane, while the eye is surrounded by a characteristic circle of small white feathers. The tongue, according to Dr. Gadow, is protractile and bifid, with each half broken up into numerous stiff horny fibres, so as to form a brush. The wing has ten primaries, but the first is very minute; and the tail is short and quite square. Twelve species of white-eye are found in Madagascar and the Mascarene Islands, which Canon Tristram divides into the green-backed and grey-backed groups; while five inhabit India, and several Australia. Japan also possesses a species; and several others occur in Africa.

Taking as an example the green-backed white-eye (*Z. gouldi*) of Australia, we find this bird is well known to settlers as being exceedingly partial to garden-fruit. Being particularly fond of figs and grapes, it consequently abounds in all the gardens where those plants are cultivated, and it is as often to be seen and as numerous as sparrows in England; besides feeding upon fruits, it catches flies while on the wing, after the manner of the true flycatchers. Its note is a single plaintive one, several times repeated; and its flight is irregular and of short duration. The breeding-season commences in August and ends in November: the nests during the earlier part of the season invariably contain two eggs, but in those found in October and November the number is increased to three, and rarely to four. The nest is small, compact, and formed of dried wiry grasses, bound together with the hairy tendrils of small plants and wool, the inside being lined with very minute fibrous roots. The eggs are greenish blue, without spots or markings. In South Australia the white-eye just described is replaced by a grey-backed species which frequents gardens, building its nest and rearing its young in shrubs and rose-trees bordering the walks. This species make a very neat nest, and its eggs are of a beautiful pale blue. The green-backed white-eye has the crown and upper-parts olive-green; the wings and tail are brown edged with olive-green; the throat and under tail-coverts light greenish yellow; and the breast and under-parts grey, tinged with brown.

THE SUN-BIRDS.

Family *NECTARINIDÆ*.

The sun-birds are a tropical family corresponding in the Old World to the humming-birds of the New; and are characterised by the long, slender, curved bill, with the sides compressed along to the tip, which is acute, and in which both mandibles are finely serrated for the terminal third of their edges, the wings being of moderate size, and consisting of ten primaries, the tail being more or less elongated, with the middle feathers sometimes prolonged beyond the rest, the metatarsus being usually short, and the toes of moderate size, the claws being curved and sharp. The sexes are very different; the males having bright metallic tints in the plumage, while the females are dull in colour. Most numerously represented in the African continent, the sun-birds are fairly plentiful in the Indian region, and likewise occur in Australasia.

Typical Sun-Birds. The birds of the genus *Nectarinia* have the bill long, curved, and acute, while the wings are moderate and rounded, the tail broad and slightly rounded, with the central feathers lengthened and narrowed, the metatarsus short, and covered in front with very broad scales. The majority of these sun-birds are found in Africa, but the Australian sun-bird represents the genus in Australasia.

Malachite Sun-Bird. One of the best known of the South African sun-birds is the malachite sun-bird (*N. famosa*). According to Captain Shelley, this species is partial to the blossoms of the aloe, among which it finds an abundance of its insect food: but it feeds also upon saccharine juice, extracted from

blossoms by means of its long, brush-tipped tongue. It has a shrill, not unpleasing, but short song. When pursuing a rival uttering a piercing scream, it is very combative, and if two males meet about the same bush, a fight is sure to ensue, to the great detriment of the beautiful tail-feathers. The males lose their beauty in the winter season; and the young birds are just like the females. The domed nest is built of cobwebs, lichens, and dry leaves, and usually suspended on the outside of a bush, or the branch of a tree; the eggs, two in number, are of a dull greyish



MALE AND FEMALE OF THE METALLIC SUN-BIRD ($\frac{2}{3}$ nat. size).

brown colour, minutely mottled all over. In Natal this sun-bird frequents the open country, feeding upon the nectar of the various kinds of aloes, and also on that of some species of lilies, which are numerous in many of the valleys. Mr. Andersson observes that "this sun-bird is permanently established where it has once taken up its abode. Its food consists of insects and the saccharine juices of flowers, in search of which it flits incessantly from one flowering tree to another, now settling and now hovering, but glittering all the while in the sunshine like some brilliant insect or precious gem. The male, in addition to the beauty of its plumage, possesses a very pleasant warble." The adult male has the general

plumage, a shining malachite-green with the tufts of the breast brilliant yellow; the two central tail-feathers are prolonged three inches beyond the rest; and the wings and tail are blackish. The female is dull brown above, tinged with green, and beneath is greenish yellow.

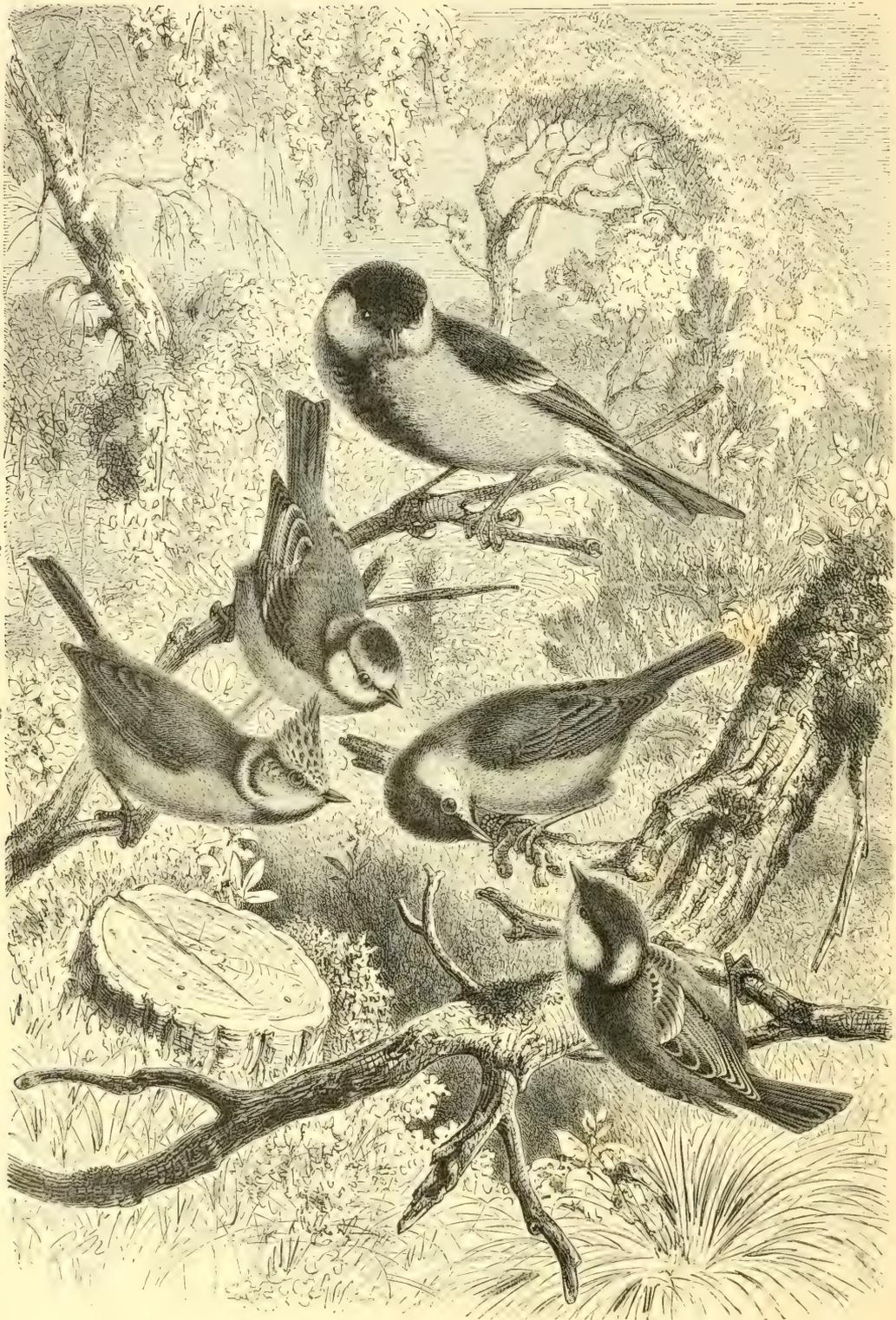
Metallic Sun-Bird. The sun-bird (*N. metallica*), represented in our illustration on p. 445, inhabits Equatorial Africa, living in pairs wherever the mimosa is abundant. During the heat of the day its actions become most animated; and at noon, when all the other birds seek rest and shelter from the parching heat, this sun-bird flies from blossom to blossom, accompanied by its faithful little mate. Standing beneath a mimosa tree in full flower, an observer may hear its quick whirring flight as it alights upon the branches of the thorn-bushes, and begins to probe the blossoms in search of honey and the insects which enter the interior of the flowers in search of sweets. It feeds also upon flies and other winged insects which it takes in flight; and as soon as a male has exhausted the contents of the blossoms of one tree, he darts off to another, always followed by his mate. The male bird is much devoted to his companion, whom he frequently entertains with a lively song; and he is jealous of any intruder, darting angrily against any stray male that may happen to invade his territory, and promptly expelling him from the neighbourhood. The nest is suspended in the centre of some mimosa-tree, and is built of the down of plants and cobwebs: the eggs being reddish white in ground-colour, variegated with dark grey and violet. The adult male is brilliant green above, with the addition of a violet gorget; the wings and tail being bluish black, and the under-parts bright yellow. The female is olive-brown above, and sulphur-yellow beneath.

The Indian genera of the family are five in number, four of which are included in one subfamily and the fifth in another.

THE HONEY-PECKERS.

Family *DICÆIDÆ*.

If we exclude from this family the white-eyes, the birds to which the above name is applied comprise a group of small and mostly gaily-coloured species, distributed over the whole of the Oriental and a part of the Australian region, and nearly allied to the sun-birds, from which they may be distinguished by the beak being short and triangular, instead of long, slender, and cylindrical. Moreover, while all the sun-birds have ten primary quills to the wing, in the honey-peckers the number of these feathers may be either ten or nine; in all cases the tail is short, and the metatarsus is never elongated. In the majority of the species the two sexes differ markedly in plumage, although in a few they are alike; and in all instances the young resemble the females. None of them migrate, not even locally: while all are remarkable for the beauty of their nests, which are frequently suspended from branches, and pear-like in form. In India the family is represented by four genera, of which three, and among them the typical *Dicæum*, have nine primaries, while in the other three a small tenth primary is retained. A well-known representative of the typical genus is the scarlet-backed flower-pecker



1, GREAT TIT ; 2, BLUE TIT^c ; 3, CRESTED TIT ; 4, MARSH-TIT ; 5 COAL-TIT.

(*Dicaeum ementatum*), ranging from India to Sumatra and China. Still more beautiful is the Australian diamond-bird (*Pardalotus affinis*), a small short-tailed species, the loveliness of whose plumage it is almost impossible to describe. The general colour is, however, ashy grey, spotted and spangled all over with red, yellow, orange, and black, with the tail-coverts rich dark red. Common in some places among the large gum-trees of the deep forest, this bird has a remarkably loud call-note, which can be heard from long distances. Generally only a summer visitor to Victoria, although occasionally seen there during the winter, it nests in hollow logs, or more rarely in a hole in the ground.

THE TITS.

Family PARIDÆ.

Included, as we have already had occasion to remark, by Mr. Oates among the Crows (from which they may be distinguished by the first primary quill never exceeding half the length of the second, and being generally still shorter), the tits are by most ornithologists regarded as constituting a distinct family, which is placed by Dr. Sharpe near the honey-eaters. They constitute a considerable group of small, agile birds, obtaining their food on trees, and living principally upon insects, although they will also eat seeds and blossoms. They are all very much alike, and have a short, conical, and entire beak, about one-third the length of the head, the bristles at the rictus of the gape short, while those covering the nostrils, although likewise short, are straight and very thick. The wing, which contains ten primaries, is weak and rounded; and the metatarsus is scutellated. Thoroughly arboreal in their mode of life, seldom descending to the ground, and often going about in parties of three or four, the tits are chiefly denizens of the Old World, some inhabiting the forest-regions of Northern Europe and Asia, while others are indigenous to the Himalaya, and others peculiar to North America, there being one genus in New Zealand.

The True Tits. The true tits are specially characterised by the absence of a crest on the head; and by the rounded tail, in which the outer pair of feathers fall short of the tip by the length of the claw of the first toe. Distributed over a large portion of the world, these birds are numerous represented in Europe, while four are denizens of the Indian region; and they are also common in North America. The beak is generally strong and conical, and thus well adapted to extract insects from their hiding-places in the bark of trees: while the wings are somewhat rounded, and the tail comparatively short.

Great Tit. The great tit (*Parus major*) is a common bird in the northern parts of the Old World, living in companies which haunt woods and gardens during the greater part of the year. In England, writes Mr. Dresser, it is a resident, frequenting during the summer season woods and large gardens, where its food, which at that season of the year consists almost exclusively of insects, is best to be found. They are excellent destroyers of the latter, and for that reason are welcomed in any garden where the owners are sufficiently enlightened to know and esteem their value. During the winter season they flock together in families, and

either roam about wherever there are trees, in company with creepers and other small birds, diligently seeking after insects and their eggs in the bark of trees, or else remaining in the neighbourhood of inhabited places, picking up what refuse they can find. They are remarkably fond of picking a bone, and may often be seen near the kitchen door, watching for any stray scraps which may be thrown out. Some friends of ours, who are fond of enticing them to remain about their gardens, feed them during the winter by hanging lumps of suet in a small net on a piece of wire fixed across a high stick, in order that they may be out of reach of the cats; and I have often been astonished to see how soon a large piece of suet is demolished by these little birds. Often two or three may be seen clinging to the same piece, pecking at it vigorously, evidently enjoying the good fare prepared for them. . . . When hunting after insects, etc., in trees, they appear to examine every part most carefully, moving along and round the branches, now clinging head downwards, now moving along the limbs of the tree almost like a creeper, or clinging to the end of a small branch, examining carefully a bud to see if any insect is harboured therein. This is done in a most business-like, quiet manner, and only now and then a low call, *ze*, is uttered; but when taking a short flight from tree to tree or bush to bush, they utter their cheerful loud note." The great tit has a variety of notes, some of which are harsh and unmelodious; its song being inconsiderable but characteristic. Building early in spring, it places its nest in a variety of situations, one having been found in the roots of an elm-tree, quite a foot below the ground. Most nests are, however, placed in holes in trees, sometimes in the deserted nest of a hornet, and some have been found in garden-pumps, flower-pots, and other unlikely situations. Probably one of the most extraordinary nests ever discovered was found in a rough corner-cupboard, fixed at one end of an old shepherd's house, erected in a plantation for the use of the gamekeeper. In the centre of the cupboard was a single shelf, and the door being kept shut, the pair of tits could only obtain access through a small hole in the woodwork above; but through this opening the large amount of material employed in the construction of the nest must have been introduced. The eggs of the great tit are pure white, blotched with bright red; the bird frequently rearing two broods in the same nesting-hole in the course of the summer. The adult male has the crown of the head and the sides of the neck and throat glossy black, and the sides of the face white; the back is yellowish green; the lower part of the back and upper tail-coverts is slaty grey, as are the wings and tail; while the under-parts are bright yellow, with a black median stripe.

Coal-Tit.

An inhabitant of the fir-woods of Central and Northern Europe, the coal-tit (*P. ater*) breeds early in the year, generally in a hole in the wall or chink in some rotten tree-stump; the nest being lined with fine roots, moss, hair, and feathers. The eggs are white, spotted and blotched with red; and a nest of this species was once found in the burrow of a sand-martin. The British form of the coal-tit is regarded by some ornithologists as distinct from the Continental race, inasmuch as it has the back of an olive-brown, whereas the back of the Continental bird is slaty blue. Nevertheless some specimens of coal-tit obtained in the north of Scotland are intermediate between the British and Continental forms; while the habits of both appear to be precisely identical. The

coal-tit is an inquisitive bird; and we have known one voluntarily enter an empty mouse-trap, apparently tempted only by curiosity. The adult male has the crown black; a distinct white patch adorns the nape; the sides of the head are pure white, the upper-parts slaty blue, the throat black, the centre of the body whitish, and the flanks buff.

Marsh-Tit. Generally frequenting gardens, orchards, and woods near swampy ground, the marsh-tit (*P. palustris*) displays a marked partiality for rabbits' fur as a nesting material; some nests being almost entirely composed of it. One taken from a hole in a birch-tree was compact, cup-shaped, smooth both externally and internally, and mainly composed of rabbits' fur, interwoven on the inner side with minute chips of dried grasses, and on the outer side with fine moss; while another from Berkshire was a thick matted structure of moss and dogs' hair, the moss predominating on the outside and the hair inside. The eggs are pure white, dotted all over with red. The adult male has the crown glossy black, the sides of the neck white, the back greyish brown, the throat black, the wings and tail greyish brown, and the breast white tinged with buff.

Blue-Tit. Common in most parts of Europe, where it frequents gardens, orchards, and the neighbourhood of houses, the blue-tit (*P. caeruleus*), is a familiar bird, and often exhibits its antics in full view of any passer-by. Its laughing call-note is well known to every schoolboy, and scarcely less so are its nest and eggs. Rearing its young in a great variety of situations, the same site being resorted to for many generations, the blue tit often nests in a hole upon the ground, while a pair have been known to rear their brood in the steeple of a church. The blue tit sits very close upon its eggs, which, like those of other tits, are white spotted with pale red. Both the present species and the great tit are migratory in their habits, not only crossing the North Sea upon their journeys, but sometimes venturing into the heart of London. The forehead is white; the crown, back of the neck, and collar are bright blue; the back is yellowish green; the wings and tail are blue; the throat is dusky black and the under-parts are pure yellow.

Azure Tit. Another member of the family that calls for notice, on account of the beauty of its plumage, is the azure tit (*P. cyaneus*) of Siberia, which occasionally wanders into Europe, having been captured more than once in the neighbourhood of the Russian capital. According to an account of its habits, published by Dr. Dybowski, it appears that this tit breeds in holes in old trees, especially willows, sometimes making use of a deserted woodpecker's nest. The nest is composed of the fur of the white hare and squirrel, with a few pieces of slender grass. The azure tit lays ten or eleven eggs; and one nest is on record composed of dried green moss intermixed with fine cow-hair. The eggs are white, spotted with dull red at the larger end. The adult male has the head snowy white, appearing in life as if powdered over with blue; the back is pale bluish grey; the upper tail-coverts are Prussian blue tipped with white; the wings are greyish brown, white at the base of the inner web, and the outer web Prussian blue; while the tail is very long and bright Prussian blue, with the exception of the outer feathers, which are white, as are the lower-parts.

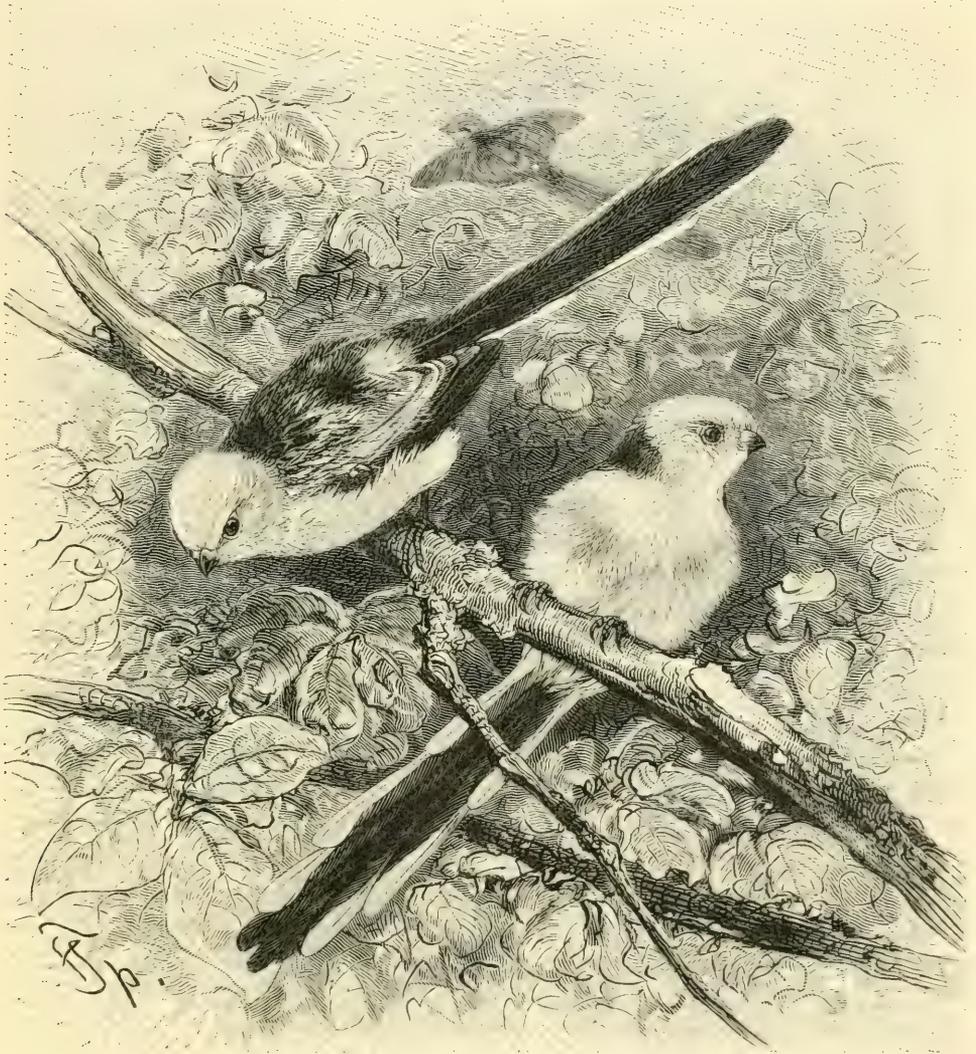
The Crested Tits. Originally included in the typical genus, the crested tit (*Lophophanes cristatus*) of Northern Europe, is now generally considered

by ornithologists to represent the type of a genus including several other species. Distinguished from the true tits by the presence of a crest on the head, the members of the genus differ from an allied group of crested tits (*Macrolophus*) by the tail being square or slightly forked, whereas in the latter it is rounded. Moreover, the black abdominal band, found in the last-named genus, is wanting in the present one. The home of the crested tit must be sought in large pine-forests, or extensive stretches of beech-wood and mixed timber. It is a shy and retiring species, not courting observation like many of its cousins, but shunning the haunts of men even in winter. In the spring we have met with it in small droves, in pairs, and even singly. Though shy and timid, if conscious of being pursued, the crested tit when left alone often allows a quiet observer to enjoy a close inspection of its plumage, and the pale grey crest, jet-black throat, and buffish under-parts form a pleasing harmony of colour. It has rather a knack of perching overhead, especially if the observer be riding, probably impelled to the survey by curiosity. Anyone who has trained his ear to recognise the cries of birds, will soon become familiar with the liquid call-note, *prrit* or *chrrit*, which may often be heard before the tiny musician has revealed its whereabouts. The crested tit has a pretty little song, generally uttered when a male bird is playfully pursuing one of his companions in mock anger. Mr. C. Thusnall says: "I have generally seen them in the top boughs of the firs, but they frequently come on to the ground, apparently to pick up a seed that may drop from the fir-cones; at anyrate, you see them fly down, look in the grass, and fly up again immediately. They appear to remain in families, as you seldom see a single one. As a rule, they prefer the rotten stem of a fir, about twelve or fourteen feet high, and bore a hole in the tree from two feet to eight feet above the ground. I have also found the nest in old stumps of very large trees within six inches of the ground. Their nidification is therefore more like that of the coal-tit in that respect." In Rhenish Prussia, the crested tit lays in the deserted nests of the crow, magpie, or squirrel, as well as in hollow trees; the nest being made of moss, wool and feathers. The eggs are white, spotted all over with bright red. When the pairing-season is over, the crested tits band together with tree-creepers, goldcrests and other tits, and scour the woods in search of food; the crested tits leading the van. They do not work the branches as minutely as other tits, preferring to range more widely.

The crested tit possesses an elongated crest, often raised; the forehead and sides of the head are white, mottled slightly with grey, the feathers of the crown black, edged with white, the cheeks and sides of the head white, the throat deep black. The upper-parts are greyish brown, so that the bird appears sombre upon the wing; the lower-parts are fulvous.

Long-Tailed Tits. Agreeing with the true tits in the absence of a head-crest, the long-tailed tits, as represented by the European species, are sufficiently distinguished by the elongation of the appendage from which they take their name. We select for illustration the white-headed long-tailed tit (*Aeredula caudata*), as being the type of the genus. Inhabiting the northern districts of Europe, and occurring also in many parts of Germany, its range somewhat overlaps that of the form termed the British long-tailed tit. The species under consideration is a tolerably common and well-known bird throughout the whole of Switzerland,

ranging up into the mountains to an elevation of five thousand feet. It would be difficult to name a more sociable or confiding species, for this tit lives in flocks during the greater part of the year, and roves about with its fellows in quest of the small insects, especially certain grubs found in the catkins of willows, which form its subsistence. Flying in an undulating fashion, and exhibiting a rather peculiar



WHITE-HEADED LONG-TAILED TIT ($\frac{2}{3}$ nat. size).

appearance on the wing, as it flits gaily from one tree to another, uttering its loud and shrill call-note almost without cessation, this tit builds a beautiful nest composed of mosses, interwoven with wool and feathers, and exquisitely trimmed on the exterior with grey and white lichens; the interior of the structure being copiously lined with a variety of soft feathers. A peculiarly shaped nest of this tit taken in Denmark, resembled in shape a plain honey-jar, placed horizontally on

the upper part of a long cleft between two large branches, to the base of which a pouch twice or three times as long as the jar itself was attached perpendicularly, filling up the face of the fork between the branches; the entrance hole being the mouth of the jar. This nest was built of moss closely covered with pieces of lichen. An early breeder, this tit lays from ten to fourteen white eggs, spotted with red; the young being sometimes hatched as early as the month of April. Both the old birds participate in the labours of incubation, and we have known the young of this species reared from the nest by hand. Indeed, long-tailed tits have been kept in confinement for no less a period than two years. The method of treatment was to confine these birds between large double windows where ivy was growing, on the leaves of which numbers of plant-lice were found, and upon these the freshly caught tits fed, and by degrees got accustomed to confinement, and would take ants' eggs and other food. About a dozen species of the genus are now known; the most recently discovered being the Macedonian long-tailed tit. Possessing a black chin, this tit otherwise resembles the British long-tailed tit with black instead of white lores. Irby's long-tailed tit inhabits Spain and Italy, while the Turkish long-tailed tit resembles the last-named in having the centre of the back grey and not black, but differs in the presence of a large blackish patch on the centre of the throat. A sixth species inhabits the northern slopes of the Caucasus, and has the forehead pale brownish, and the sides of the crown brown instead of black. The adult has the whole of the head snowy white, the hind-part of the neck deep black, the sides of the back and scapulars vinous red, the wings and tail black and white, and the under-parts whitish tinged with pink.

The single representative of this genus, *Panurus*, possesses a **The Bearded Tit.** short, subconical bill; the wing has the first primary very minute, the tail is long and graduated, the metatarsus is also long, and the feet are comparatively stout; but the distinctive character is the elongation of the feathers of the sides of the throat into a moustache. The bearded tit (*P. biarmicus*) is peculiar to Central and North Europe in its typical form, being replaced in Central Asia by a paler variety. Throughout its range it haunts large reed-beds and marshes. Norfolk was formerly its home, and a few pairs still breed in some of the more favoured parts of the broads; Mr. Stevenson writing that "when shooting at Surlingham, in the winter months, I have more than once observed the arrival of a flock from some neighbouring broad, their presence overhead being indicated by the clear ringing of their silvery notes uttered preparatory to their pitching into the nearest reed-bed; and in autumn, after roosting in small parties on the reeds, they will fly up simultaneously soon after sunrise, swarming for a while like a flock of bees, and uttering in full chorus their pretty song, disperse themselves over the reed-beds for their morning meal. Delicate as these little creatures appear, I have found them during the sharpest frosts, when the snipe had left the half-frozen waters for upland springs and drains, still busy among the reed-stems as lively and musical as ever." The writer also says that he has often found the nests completed by the end of the first week of April. These are generally placed amongst the reed-stems close to the edge of the water, supported on the loose herbage forming the foundation of the reed-beds, but never in any way suspended; they are constructed of the

dead stems of sedges and reeds, intermixed with a few pieces of grass, and invariably lined with the tops of reeds. The eggs are pure white, sprinkled all over with small purplish red spots. The food of these tits during the winter is principally the seed of the reed, and so intent are they in searching for it that they have been taken with a bird-limed twig attached to the end of a fishing-rod. When alarmed by a sudden noise or the passing of a hawk, they utter their shrill notes and hide among the thick bottom of the reeds, but soon resume their station, climbing the upright stems with the greatest facility. In feeding they approach near to the long-tailed tit, often hanging with the head downwards and turning themselves into curious attitudes. Their food is not entirely the reed seed, but insects and their larvæ, and the very young shell-nails of different kinds which are numerous at the bottom of the reeds. Mr. Keulemans, describing the finding of a nest near Rotterdam, states that "both old birds made a great noise when I captured their little home; both incessantly uttered their anxious note, *churr churr*, flying about me and performing a series of rapid movements . . . Bearded tits have no real song, their vocal powers being rather limited; nevertheless, they produce peculiar notes for expressing their different feelings. When rejoicing in each other's presence, or when one perceives the arrival of its mate, they utter repeatedly their note *ptjink, tjinck*. When disturbed, frightened, or caught, both sexes utter a very peculiar sound, like *tsjirrr-irrr irrr rrrr*. Distress or anxiety is expressed by *er-arrh ee arr-chieur*. When uttering the latter, they erect the body, bow the head downwards, and puff the feathers of the head and neck." In Holland many bearded tits are captured, chiefly during the early part of October, when the old birds go on foraging expeditions, accompanied by the young ones, to the number of six or seven in a flock. They are then caught by means of nets, which are laid down among the reeds, while decoy birds are placed at a short distance. The adult male has the head clear bluish grey; the lores and moustache stripe are black; the back is rich fawn-colour; the primaries are brown, edged with white; the tail-feathers deep rusty red; the throat and upper breast greyish white; and the sides of the body rich fawn-colour. The female is greyish fawn above, and greyish white beneath.

New Zealand Creepers. The tits of this genus (*Certhiparus*) have a bill of moderate size, curved and compressed, the wings are moderate and rounded, the tail is also long and rounded, and the metatarsus comparatively long and broadly scutellated in front. Its representatives are peculiar to New Zealand, the common form, *C. nova-zealandiæ*, being confined to the wooded portions of the South Island; where it frequents low undergrowth and the outskirts of the bush where insect life is abundant. During severe seasons it has been known to leave the shelter of the bush to frequent the sheep stations, flitting about the meat stores, and picking off morsels of fat from the bones and skins of the butchered animals. Its ordinary food consists of minute beetles and other insects. The New Zealand creeper breeds late in the summer, the young being sometimes found in the nest in December. The eggs are white, spotted with brown and purple. Sir W. Buller says that the nest is of a rounded form, and not unlike a large pear in shape. In structure it is composed of dry vegetable fibres, fragments of wool, moss, spiders'

webs, and other soft materials closely felted together. The entrance is placed on the side about one-third the distance from the top, and is perfectly round with smoothed edges; the interior being lined with soft white feathers. The adult male of this tit has the upper-parts bright cinereous brown, inclining to rufous; the quills of the wing are light brown; the tail is pale rufous; the sides of the head and nape are grey; and the throat, breast, and under-parts rufous white.

Allied Types. There are several other genera of tits, such as the Oriental *Ægithaliscus*, which comprises some small species differing from the true tits in the more graduated form of the tail, the longer and more copious feathers on the crown of the head, and the absence of a dark band on the under-parts. The yellow-browed tit (*Sylviparus modestus*) of the Himalaya represents a second genus, distinguished from the preceding by the squared or slightly forked tail.

In the neighbourhood of the tits Mr. Oates would place the so-called crow-tits (*Conostoma*, *Paradoxornis*, *Suthora*, etc.), which are restricted to the mountains of North-Eastern India and parts of China, and are referred by some ornithologists to the *Crateropodidae*. Mr. Oates writes that "the position of these birds has been much disputed, but looking to the facts that they have ten primaries, that the young are identical in plumage with the adult, and that the nostrils are completely hidden by stiff bristles, their location with the crows and tits seems the proper course to adopt." Those species of which the nesting is known, build cup-shaped nests in trees, and lay eggs marked with yellowish brown and purple.

THE SHRIKES.

Family LANIIDÆ.

A somewhat variable group, including such different forms as the gay-coloured minivets, the cuckoo-shrikes, the crested jay-shrikes, the plainer wood-shrikes, and the Indian pied shrikes, the members of this family have the edges of both mandibles either smooth, or the upper one simply notched or toothed, or both together; the hinder surface of the metatarsus is smooth and covered with two longitudinal plates; the wing has ten primaries; the tongue is of ordinary form: the nostrils are clear of the line of the forehead, and more or less overhung with bristles; and there are twelve tail-feathers. The plumage of the nestling is cross-barred, and there appears to be only an autumnal moult. The family comprises a large number of genera, and, with the exception of South America, has a cosmopolitan distribution, although most numerous in Africa.

The Shrike-Tits. The species composing the genus *Falcunculus* have been described as uniting the form of a shrike with the habits of a wood-pecker; they possess a strong toothed bill, with which they are able to tear off pieces of rotten wood, and even the bark of gum-trees in search of food, and they have a crest of feathers. Inhabiting the larger branches of trees, and resembling the tits in many of their habits, when attacked by an enemy they defend themselves with ferocity. All being exclusively Australian, the white-bellied shrike-tit (*F. leucogaster*) is a native of Western Australia, while the frontal shrike-tit (*F. frontatus*) inhabits South Australia and New South Wales.

Frontal Shrike Tit. This shrike-tit is a bird of great animation and sprightliness; its chief food consisting of insects, which are obtained either among the foliage of trees or under the bark of the larger branches and trunks. In procuring them, the bird exhibits great dexterity, stripping off the bark in the most determined manner, for which purpose its powerful bill is admirably adapted. Whilst searching the branches for food, it frequently erects its crest and assumes many pert and lively positions; and no bird of its size possesses greater strength in its mandibles, or is capable of inflicting more severe wounds. Its song consists only of a few piping notes. The male has the crest pure black, the sides

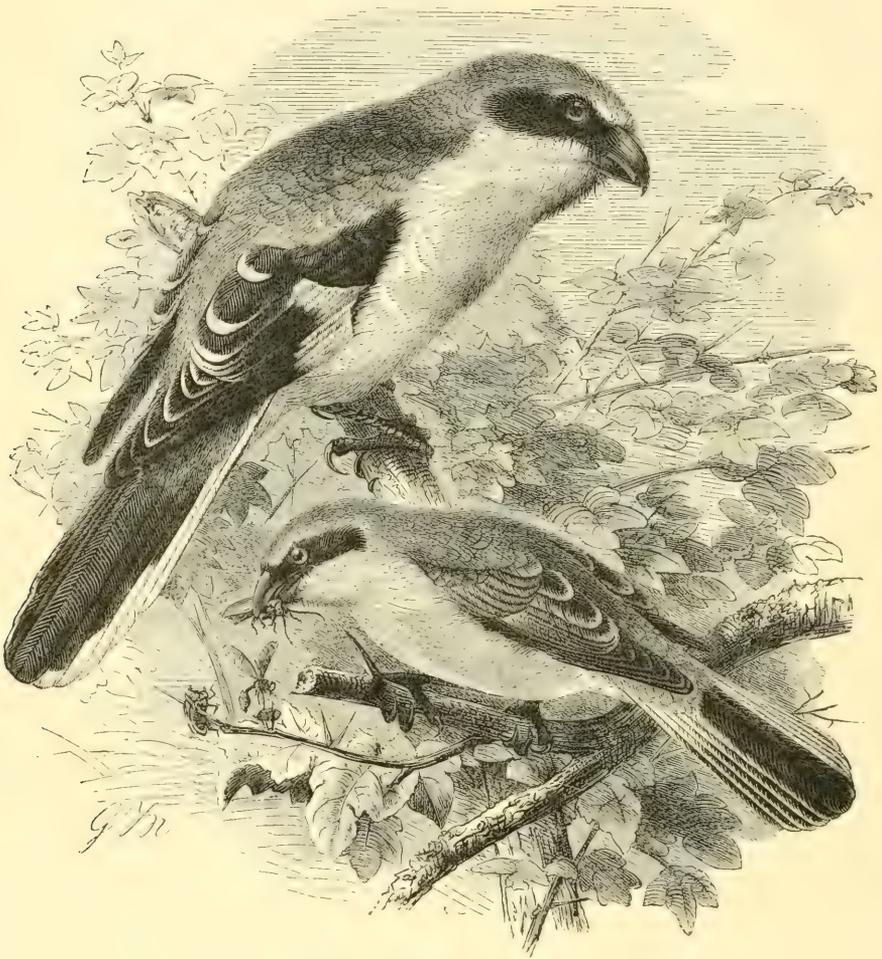


FRONTAL SHRIKE-TIT ($\frac{2}{3}$ nat. size).

of the head white, divided by a black line, the back, shoulders, and wing-coverts olive, the primaries, secondaries, and tail blackish brown margined with grey, the two outer tail-feathers and the tips of the remainder being white; while the throat is black, and the under-parts are bright yellow.

True Shrikes. The true shrikes (*Lanius*) have the large compressed bill, hooked and toothed, and thus adapted to enable them to tear the flesh of the small mammals and birds upon which they often prey. The wings are moderate in length but comparatively powerful, the tail is generally much longer

than the wings, and graduated, the central feathers being the longest. The relatively strong metatarsus and toes are of assistance in enabling the shrikes to retain hold of beetles and other insects. The great grey shrike inhabits Western and Central Europe, being replaced to the eastward chiefly by a single-barred species, which extends through Asia, merging into the great northern shrike of North America. The brightly-coloured shrikes belong chiefly to Africa.



GREAT GREY SHRIKE AND RED-BACKED SHRIKE ($\frac{1}{2}$ nat. size).

Great Grey Shrike. The great grey shrike (*Lanius excubitor*) is a common bird in the northern and central parts of Europe, frequenting the skirts of forests in the summer. It is a shy and retiring species when unmolested, but when it has lost its nest or young becomes most vociferous. Willughby was perhaps the first English naturalist to describe the employment of this shrike in the capture of passage-falcons. On the Rhine they are persecuted by the gamekeepers, and the shrike that has lost his mate will often fly to the top of a very tall poplar tree and thence pour forth his woes. The plan adopted for

destroying these birds is to mark down their nests and kill the young birds and one or both parents, before the former can fly. The great grey shrike builds in a variety of situations; Mr. Seebohm found a nest of this species in the top of a Scotch fir, and Mr. Collett observed another in Finmark, containing six young ones, in a birch-tree on a sterile terrace. The nest was easily seen, and constructed of dry twigs together with straw, thickly lined with white feathers of the willow-grouse, and a little wool. In Central Europe large forest-oaks are most frequently chosen by this species to contain its nest, the tree selected being always on the edge of a belt of timber, never in the centre of a big wood; such nests being generally placed at the apex of a forked bough a long way out from the main trunk, built on a knot in the fork, at an elevation of some thirty-five or forty feet. The nest itself is a bulky structure composed of fine twigs interlaced with a few stout straws, bents, and fibres. Within, it is quilted with a profusion of soft substances, feathers of the pheasant and buzzard, a little of the white fur from the belly of a hare, and some of the shed coat of the roe deer, sheep's wool, or any convenient substitute. The eggs of this shrike are greenish white in ground-colour, blotched with olive-green, wood-brown, and dull lilac. The great grey shrike is most assiduous in the care which it bestows upon its young, and it is touching to see the distress and consternation which it exhibits if it imagines that the safety of its charge is endangered.

To a large extent migratory in its habits, this bird does not breed in the British Isles, although a considerable number visit England and Scotland in the fall of the year. They have occurred on Heligoland as early as the middle of August; and whilst a few individuals yearly pass along favourite "fly-lines" in certain years their numbers have increased tenfold. Those which winter in England for the most part lead lives of solitude, frequenting a particular beat of country for a week or two at a time, during which the familiar outline of the butcher-bird may at any moment be detected perching upon the top of some leafless tree, watching incessantly for field-voles, shrews, and small hedgerow birds. The flight of the shrike is sometimes high and sometimes low, but constantly undulating. With the arrival of spring the great grey shrike in England moves eastward to the coast, from which it takes its departure in March and April, though an occasional straggler is sometimes reported as having been seen during the summer. In common with other butcher-birds, the great grey shrike is in the habit of impaling the carcase of its prey upon some convenient thorn, in order both to facilitate the flaying of the bird or small mammal, and also to provide a larder. The great grey shrike has the upper-parts nearly uniform slaty grey; the lores, cheeks, and ear-coverts are black; the wings are black with white bases to the quills: the graduated tail is black and white: and the under-parts are pure white, often finely barred with crescentic grey markings.

Lesser Grey Shrike. The lesser grey shrike (*L. minor*) is a migratory species, wintering in Africa, and passing the summer months in Central and Southern Europe, Asia Minor, and Persia. Mr. Seebohm says that in Eastern Europe this shrike frequents the outskirts of cultivation, where trees and bushes of various kinds struggle for existence amongst the broken rocks. This species breeds early in June, and the nests found in Slavonia are built in acacia trees; in

size they are as large as those of the blackbird, and chiefly composed of chickweed, freshly plucked feathers, and wool. Some contained as many as six eggs, these being bluish green in ground-colour, spotted and blotched with greenish brown. This shrike feeds principally upon beetles, butterflies, grasshoppers, and other insects. Its flight, like that of its congeners, is undulating, but easy and comparatively noiseless; the bird skimming through the air like a partridge for a moment or two before it alights on some perch, on to which it drops with a scuffle of the wings. The song is a not unmusical chatter, something like the twitter of the swallow or



LESSER GREY SHRIKE ($\frac{1}{3}$ nat. size).

starling, but louder and mixed with some harsher notes. The bird has a variety of notes, some very harsh, which are probably alarm notes, and others somewhat plaintive. In the adult the forehead, lores, and ear-coverts are deep black; the crown of the head and all the upper-parts pearl-grey; the wings black, the primaries having white bases which form a single white wing-bar; the tail is black and white; and the under-parts are white tinged with reddish-buff.

**Red-Backed
Shrike.**

The red-backed shrike (*L. collurio*), which is represented in the lower figure of the illustration on p. 458, is another migratory bird, spending many months of the year beneath the burning rays of an African sun, and returning northwards in the spring of the year in order to rear a fresh family in its haunts in Central Europe and the British Isles. Those individuals that

visit England (for in Scotland the bird is very rare), apparently journey to their summer quarters by way of the valley of the Rhine. The red-backed shrike arrives somewhat later than the majority of summer migrants. Each pair becomes established in a certain area which it rarely if ever leaves; the male bird being conspicuous as he perches on some tall spray of hawthorn. We have never seen this shrike build in a tree of any kind, and it seems invariably to build in a hedge or low bush; the nest, although this circumstance is exceptional, being at times placed in a tiny bush barely eighteen inches from the ground. The nest is built of dry stalks and moss, lined with fibrous roots and a little hair; the eggs vary, being sometimes yellowish white with markings of olive and lilac, and sometimes salmon-coloured marked with light red. No sooner has this shrike reared its young than it prepares to leave Britain, hurrying south in advance of many other summer birds, in order that it may perform the operation of moult in the heat of a tropical winter. So long as it remains in England, it always exhibits the same alert character—vigilant, resourceful, always ready to anticipate danger. It is a bird of rapid flight and considerable agility; and when in the act of seizing some winged prey, shoots forward like an arrow released from the bow, and rarely misses the quarry. It will swoop upon a humble-bee, impaling the unfortunate insect with perfect deftness upon the sharpest thorn available. Although the red-backed shrike is generally content to feed upon insects, it has been known to attack a lizard, and is partial to small birds, field-mice and frogs, and sometimes attacks the decoys of bird-catchers like the great grey shrike. The adult male has the head, back, and sides of the neck bluish grey; the middle of the back and scapulars dull brick-red; the wings dull black edged with rufous; the tail black-and-white; the forehead, lores, and ear-coverts black; the chin white; and the under-parts rose-colour. The female is brownish grey above with a reddish brown tail: the under-parts being dull white closely barred with transverse brown markings.

Woodchat Shrike. The woodchat shrike (*L. pomeranus*) is rather a rare bird in many parts of its summer quarters in Central Europe, although it is the commonest of all the shrikes in Portugal. Preferring to nest amid extensive orchards, it is absent from forest-land, and frequents sunny valleys and the gentle slopes of low hills commanding a southern aspect, rather than more elevated and exposed situations. A trained eye soon learns to recognise the woodchat at a considerable distance, and we have often pointed out to our companions a woodchat when the bird appeared to the naked eye, or even to the binoculars, to be merely a small white patch on the side of a bush. This is easily explained by the fact that the woodchat, true to the watchful character of its congeners, invariably perches (at least during migration, to which alone these remarks apply) upon the outside of a bush, its white breast facing outwards towards the quarter from which it apprehends the approach of danger. The flight is strong and undulating. During migration these birds travel constantly in the wake of their fellows, and although two days may often interrupt the migration, when it is resumed, it will be found that shrikes adhered to the line taken by the advance-guard. In Eastern Algeria this shrike breeds in numbers on the hillsides, constructing its nest almost entirely of the stalks of a small grey flower. As a rule, the eggs

are bluish grey in ground-colour, spotted and blotched with dark grey and brown. Captive specimens will eat not only insects, but likewise small frogs; and, in default of thorns, will hang their prey on the crossbars of their cage. The adult male has the crown of the head and lower neck bright chestnut; the forehead and ear-coverts jet black; the scapulars and rump pure white; the wings and tail black-and-white; and the lower-parts white, slightly tinged with buffish red.

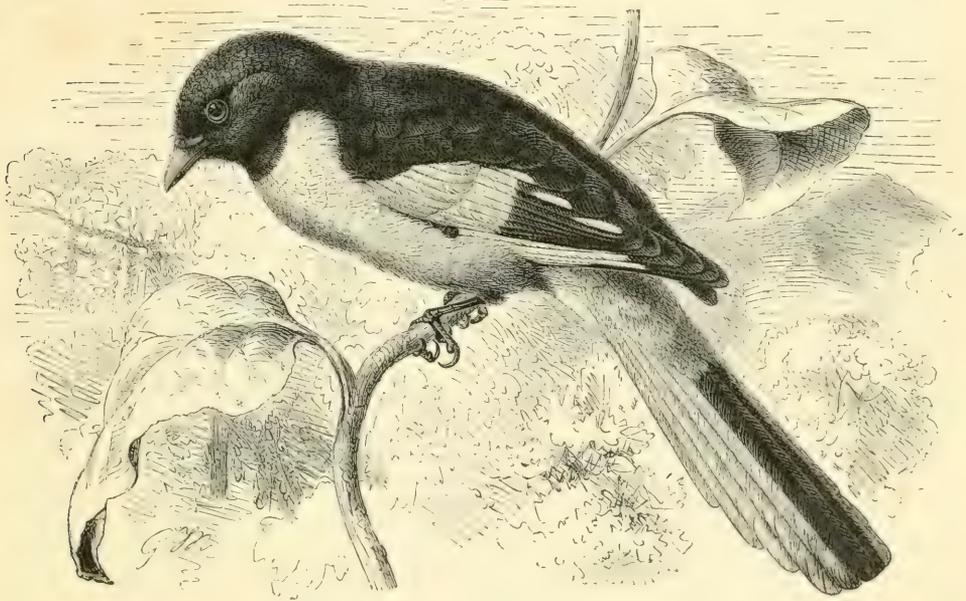


WOODCHAT, MASKED, AND HOODED SHRIKES ($\frac{1}{2}$ nat. size).

Masked Shrike. The masked shrike (*L. nubicus*), represented in the left-hand figure of the illustration above, is a Nubian species, which passes the summer in Greece as well as the northern parts of Africa. It arrives in the Morea at the commencement of May, and proceeds to take up its quarters in cultivated valleys, generally nesting in the vicinity of pasture-land. This shrike builds its nest in olive-trees and bushes, the nesting materials consisting of leaves of plants, grass-stems, and fibres. It lays a pale greenish grey egg, clouded with yellow and

irregularly spotted with black. It feeds principally upon beetles and other insects, like the woodchat, and possesses a pleasant song. The adult male has the forehead white, this colour extending behind the eye, the scapulars being also of the same hue; the crown and entire upper-parts are bluish black, the wing-coverts being edged with whitish; the tail-feathers are black-and-white, and the lower-parts white tinged with reddish yellow.

Hooded Shrike. The hooded shrike (*L. erythropterus*), is an Algerian bird, breeding in well-bushed situations, where it runs about with great rapidity in search of its food. It is a skulking species, and keeps out of sight as much as possible. The call-note is a harsh cry, *tshagra tshagra chagra chrug*. Canon Tristram says that this shrike never exposes itself in any conspicuous situation, but always remains concealed in the thickest recesses. The only nest



INDIAN SCARLET MINIVET ($\frac{2}{3}$ nat. size).

he took was placed in the centre of an arbutus bush, and was large and coarsely constructed of twigs, with a thick lining of wool and hair. It contained four eggs, which were white in ground-colour, spotted with brown and blotched with red. The adult has the crown of the head and nape black, the eyebrow white, the scapulars black margined with chestnut, the wing-coverts bright chestnut, the wings black, bordered with red, the tail black, broadly tipped with white, the chin white, and the under-parts ashy grey.

The Minivets. The shrikes of the genus *Pericrocotus* possess a bill shorter than the head, moderately broad at the base, hooked and notched; the nostrils are concealed by the frontal plumes; the wing is long and pointed; the tail long and greatly graduated; and the feet are short and comparatively feeble. Mr. Oates points out that the members of this genus are remarkable for the stiffened shafts of the feathers of the rump. The minivets are peculiar

to India and Eastern Asia; the Siberian minivet, inhabiting Mantchuria in the summer time, and migrating through China to winter in the Philippine Islands and the Malay Peninsula, being the hardiest of the family. It is grey above and white below, but the majority of minivets are gaudy in their attire, scarlet and yellow predominating in their plumage, or at least in that of the male bird, for the females are less gorgeous. The brilliantly-coloured Indian scarlet minivet (*Pericrocotus speciosus*), like other members of its genus, is arboreal in its habits, and lives in family-parties, which fly briskly about the branches of their favourite trees in active pursuit of their insect prey. The call-note of the species is lively and frequently repeated. Nesting in April, this minivet constructs a beautifully cup-shaped nest of moss trimmed with lichens, which is placed in a slender branch. In colour the eggs are greyish white, marked with brown and inky purple. The adult male has the whole head, back, and scapulars glossy black; the lower surface from behind the throat, together with the rump and upper tail-coverts are vivid scarlet; while the wings are black, barred with scarlet; and the tail is scarlet except the middle pair of feathers which are black.

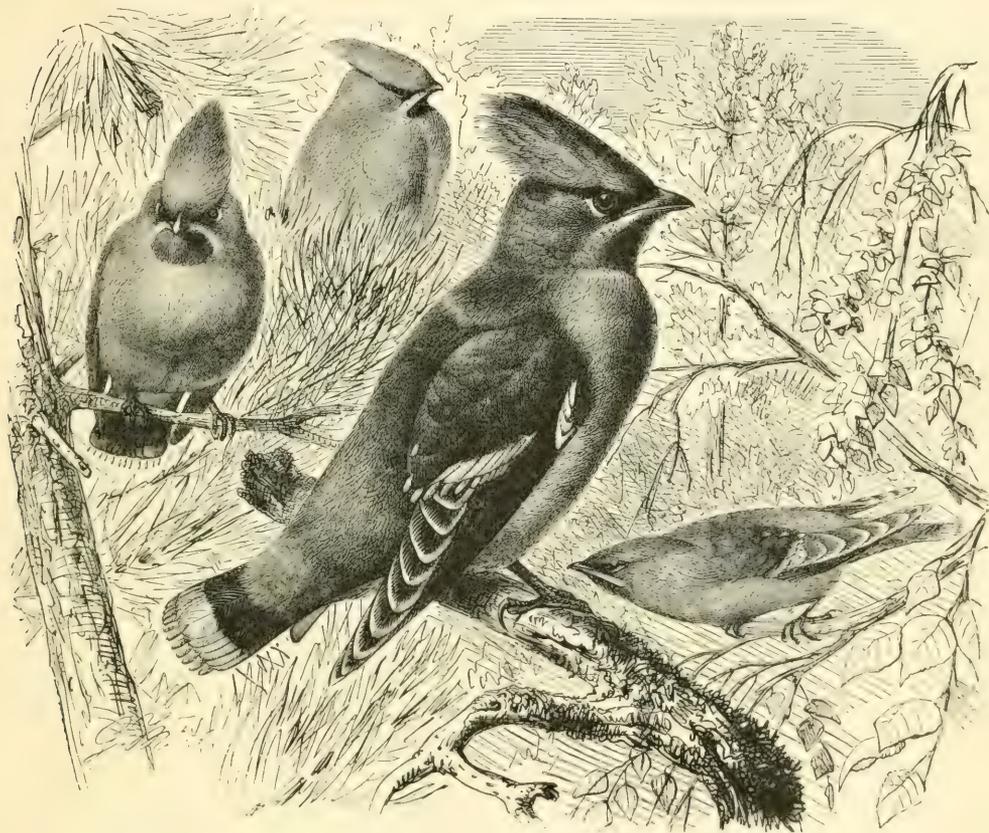
Other Genera. The number of genera included in the shrike family renders it impossible to allude to all, and we can consequently refer only to a few. Among these the pied shrikes (*Hemipus*) of India and Malaysia differ from the true shrikes by the broad and flattened beak, in which the edge of the upper mandible is merely notched near the tip, in place of being strongly notched and toothed. The wood-shrikes (*Tephrodornis*), of which there are three Indian representatives, are distinguished both from the preceding genus and the true shrikes by the squared tail; the general colour of the plumage being grey. The Australian piping crows (*Gymnorhina*), which are here placed among the crows (p. 323), are by some writers included in the present family; and the same is the case with *Struthidea* (p. 322). On the other hand, the crow-shrikes (*Strepera*) of Australia are more generally referred to the *Corvidæ*; but Dr. Sharpe places the whole three genera in the *Laniidæ*. There is also some difference of opinion as to whether the cuckoo-shrikes (*Campophaga* and *Graucalus*), which range from India to Australia, are likewise members of this family, Dr. Sharpe referring them to a distinct family (*Campophagidæ*), while Mr. Oates places them here. Agreeing with the minivets in their spiny rump-feathers, the cuckoo-shrikes differ in having the tail but moderately instead of greatly graduated, while the outer feathers are more than three-quarters (instead of less than half) the entire length of the tail.

THE WAXWINGS.

Family *AMPELIDÆ*.

The waxwings, together with the allied South American family of the greenlets (*Vireonidæ*), are generally placed between the shrikes on the one hand, and the thrushes and warblers on the other. Containing only five genera, with not more than some nine species, they are characterised by a short and slightly hooked bill, broad at the gape, long wings, and short legs; their plumage is very soft and silky. The waxwings are inhabitants of the northern half of both hemispheres,

and form a single genus, *Ampelis*. The metatarsus is short; the feet are weak; and the inner quills of the wings are tipped with curious red horny appendages, compared to pieces of sealing-wax. The Bohemian waxwing inhabits the northern parts of the Old and New Worlds; the Japanese waxwing breeds in South-Eastern Siberia, and winters in Japan, China, and Formosa; while a third species, the cedar-bird, is peculiar to North America. Great interest for many years attached to the nesting-habits of the Bohemian waxwing (*A. garrulus*), which were surrounded by mystery until solved by Messrs. Dresser and Wolley. The former of these ornithologists found the waxwing breeding in Finland in

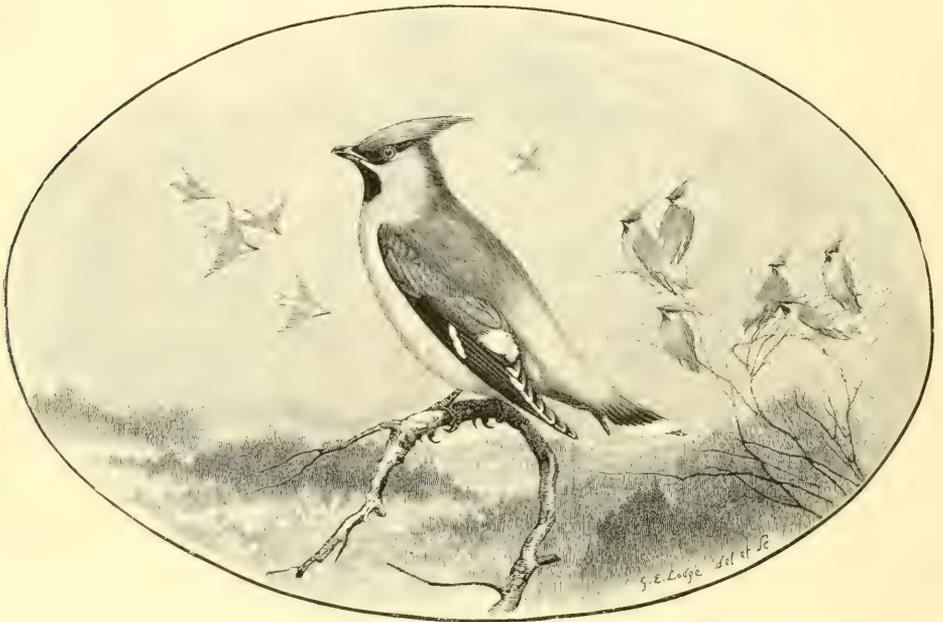


BOHEMIAN WAXWING ($\frac{1}{2}$ nat. size).

the year 1858, only two years after the latter had obtained the nest of a waxwing in Lapland.

Writing of his nest-hunting experiences, Mr. Dresser says that, after finding a tree in which a waxwing built, "I climbed up to the nest, which was in the fork between the main stem and the first branch, and not above nine or ten feet from the ground. The moment I touched it, the young ones (five in number) flew out. I jumped down, and made a cut at the largest with my cap, and secured him. Directly the young one which I had caught began to cry out, several waxwings flew from the neighbouring thicket, all, however, keeping out of gunshot, except two

which came close round me, and both of which I shot. I then sat down and imitated as well as I could the call of the old birds. I was soon rewarded for my trouble by a young one coming out of a blueberry bush, close by, and calling lustily. I then climbed up again and took the nest away carefully, so as to preserve the shape, and to my great delight found one egg in it. We hunted for several hours in the higher part of the island for another nest, but, although we saw about nine old birds, we didn't succeed in finding another nest." The eggs of the waxwing are pale blue, marked with purplish underlying shell-markings and black overlying surface-spots. In certain winters large numbers of waxwings cross the North Sea to winter in the British Isles, where, unfortunately, their pretty plumage and strange appearance mark them as a certain prey of the loafing gunner. In its habits the waxwing is confiding and tame, though much less so in the spring and



A FLOCK OF WAXWINGS.

summer than in the winter. "At the latter season of the year," writes Mr. Dresser, "I used to see large flocks in Southern Finland, usually frequenting the mountain-ash trees, and very often seen in the gardens quite in the centre of the towns. So tame are they that, when fired at, and one or two killed, the remainder will only fly to a short distance, and soon return to the same tree again. The flocks are often very large; and I have known of more than twenty specimens having been killed at one shot; I once killed as many as fourteen at a shot off a large mountain-ash tree, on which a flock was perched picking off the berries. It is a peculiarly silent bird; and I watched a flock for some time without hearing any of them uttering a sound. The only note I have heard is a low plaintive whistle, from which, I imagine, it is called by the Finns by the name of *tilli*, as this gives some idea of the sound of its call-note. When frightened, or suddenly disturbed, the same

note is uttered, but is then shriller and louder in tone. The bird sits very erect, and carries its crest so that it is distinctly seen; when frightened, it at once raises its crest, slightly spreading it. A flock busy feeding on a rowan tree, especially if the ground and tree are covered with snow, is a most pleasing sight; and I have often sat and watched them from a window close to which was a small mountain-ash, to which they often came to feed on the berries, which latter having large clusters, like bunches of coral beads, forming a rich contrast to the pure white snow." Waxwings in confinement are somewhat inactive birds. Sometimes, it is true, they will hop restlessly from perch to perch, or even take a brisk fly around the aviary; but for the most part they prefer to squat upon some favourite perch, occasionally uttering a short succession of running notes. They feed somewhat greedily, and show a preference for dried currants. During the winter months small flocks of waxwings may often be seen in Southern Sweden, flying hither and thither at a considerable height, and presenting somewhat the appearance of starlings, from their long wings and comparatively short tails. The adult male waxwing has the upper-parts generally light greyish brown; the forehead and the crest are reddish chestnut; a broad black streak passes through and above the eye from the base of the bill; the primaries are blackish, with the outer web towards the tip white on the outer feather, and yellow on the inner ones, and the inner web broadly tipped with white; the secondaries are blackish grey, tipped with red wax-like appendages; the tail is grey at the base, black towards the tip, and terminated by a broad bar of yellow; the throat is black; and the under-parts are vinous red.

Cedar-Bird.

A well-known bird in the orchards and gardens of the United States is the cedar-bird, or cherry-bird (*A. cedrorum*), a smaller species than the Bohemian waxwing, and less beautifully coloured, but still possessing considerable interest. The cedar-bird nests somewhat late, generally building in an orchard or garden; the nest is placed in a bough, or upon a limb of the tree. The nest is built of coarse, dry stalks of grass, lined with very fine stems of the same. The eggs are bluish white, thickly marked with blackish spots. The young are at first fed upon insects, but, as they advance, berries become their chief diet. A young bird reared from the nest proved to be very impatient of confinement, but when suffered to fly at large descended from the trees in which he passed the day, in order to perch upon his owner's arm. The cry of the young bird for food is loud and incessant. The cedar-bird flocks in July and August, and betakes itself to regions in which whortleberries are plentiful, in order to gorge upon the fruits. In October these birds descend to the lower parts of the country, to feed upon the berries of the red cedar; thirty or forty birds may sometimes be seen fluttering among the branches of one small cedar-tree, plucking off the berries. In the fall and beginning of summer the cedar-bird becomes extremely fat; hence it was formerly esteemed for the table. The adult bird has the head, neck, breast, upper part of the back, and wing-coverts purplish cinnamon, shading into ash on the rump; the forehead, lores, and eye-stripe are black, the wings slaty grey, with the inner feathers tipped with red horny appendages; and the tail is grey, tipped with yellow.

H. A. MACPHERSON.

CHAPTER V.

THE PERCHING BIRDS,—*continued.*

THRUSHES AND WARBLERS TO SWALLOWS.

Families *TURDIDÆ* to *HIRUNDINIDÆ*.

IF we follow Dr. Sharpe, in including the warblers in this family, it will be an extensive one, embracing not only the thrushes proper, but likewise the chats, ousel, warblers, grasshopper-warblers, and leaf-warblers. Mr. Oates, on the other hand, regards the warblers as a distinct family, which he does not even place in juxtaposition with the thrushes. Used in the wider sense, the family is characterised by the beak being slender but rather depressed, and variably modified in the different groups; the wings are comparatively long and slender, with ten primary quills; while the tail-feathers may be either ten, twelve, or fourteen in number. Although variable, the feet are generally slender, and the metatarsus is elongated; while the nostrils are free from hairs. In the typical members of the family, the plumage of the nestling is mottled or squamated, but in the warblers it is like that of the adult female, but more brightly coloured. With the exception of New Zealand, members of the family are found throughout the world.

True Thrushes. The true thrushes (*Turdus*) and their allies constitute a subfamily (*Turdinæ*), the members of which, together with the chats and red-starts, agree in the mottled or squamated plumage of the nestlings; there is but one complete moult in the year, the number of tail-feathers is never less than twelve, and the metatarsus is smooth behind. In the present subfamily bristles are present at the rictus of the gape. More frugivorous in their tastes than the chats, the thrushes spend a larger proportion of their time on the ground, more especially in open meadowlands, searching for worms and slugs. All possess fine vocal powers; and they all build cup-shaped nests, generally composed in part of mud. The true or spotted thrushes (*Turdus*) have the beak of moderate size, decurved and notched near the extremity; the wings and tail are long, and the tail is slightly graduated; there is no pattern on the underside of the wing; and the metatarsus is longer than the fourth toe. The feathers of the throat and breast are more or less spotted at all ages. The true thrushes are most abundant in South America, which is the home of no fewer than twenty-four species. Ten breed in North America, while only five breed in Europe and Northern Asia, namely, Père David's thrush, and the four species next described. Nine species are peculiar to Africa, such as the olivaceous thrush of the Transvaal, another species from Natal, and



GROUP OF THRUSHES.

1, Missel-Thrush ; 2, Redwing ; 3, Song-Thrush ; 4, Fieldfare ; 5, Blackbird.

the South African thrush; this last uttering a peculiar half song, half call, as if it were troubled with a cold.

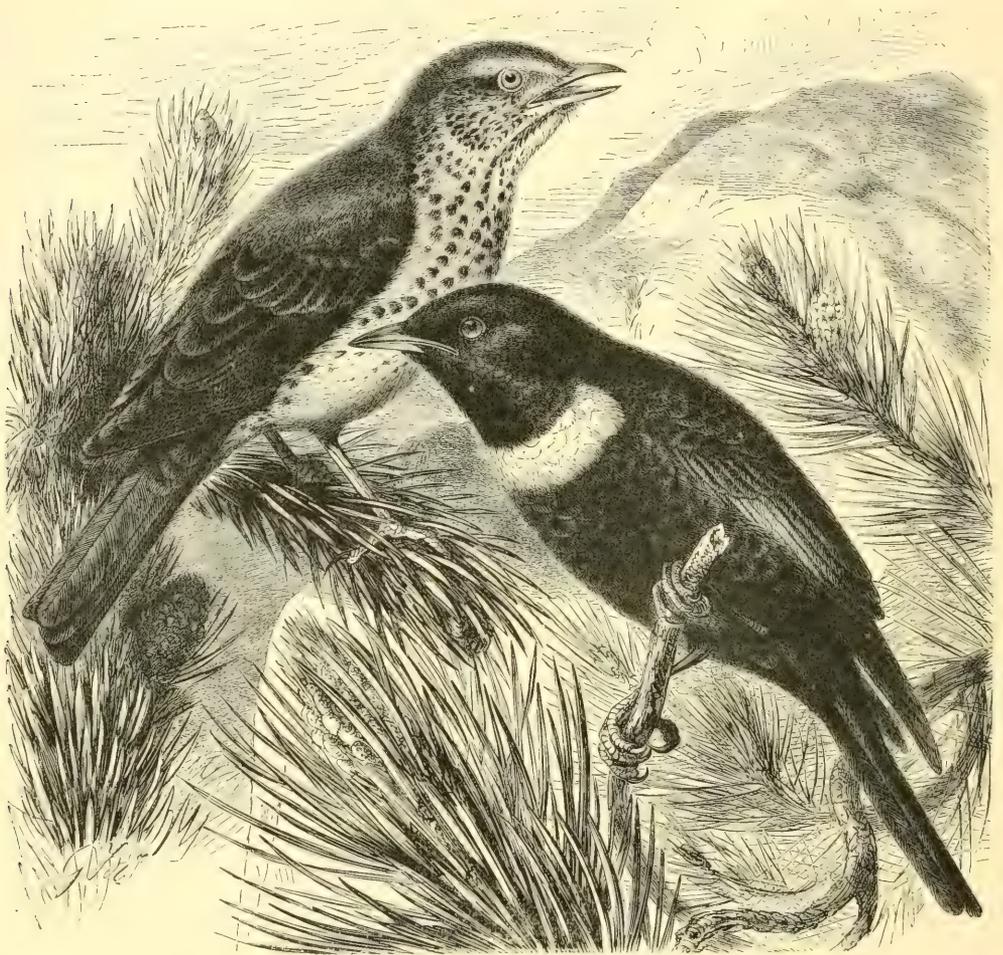
Missel-Thrush. The missel-thrush (*Turdus viscivorus*) is found in nearly every part of Europe at the one or other season of the year, breeding in the northern regions, and wintering partially in the southern parts. It has enormously increased its breeding-range in the British Isles during the present century; and



A PAIR OF ROCK-THRUSHES.

in the autumn and winter months is shy and retiring, hunting the open fields in flocks, which exercise extreme vigilance over their common safety. Although this bird feeds principally upon worms and berries in the winter, its common name is derived from its passionate fondness for the berries of the mistletoe, which are rejected by the majority of small birds, even when pressed by hunger. The missel-thrush pairs early in the season, and the nest is generally placed in some conspicuous position. In districts where magpies are numerous it often builds its nest in a bush

or low tree close to a cottage, as though recognising a certain protection in the neighbourhood of man. The nest is built of stems of dry grass, moss, and vegetable fibres, often trimmed externally with grey lichens; the eggs being greyish green in ground-colour, spotted with chocolate. During the breeding-season the missel-thrush exercises a watchful surveillance over the orchard or garden in which its nest is built, boldly mobbing jackdaws and even larger intruders, if they attempt



SONG-THRUSH AND RING-OUZEL ($\frac{1}{2}$ nat. size).

to rob its belongings. The old birds exhibit much devotion to their young, and will permit of a very close approach whilst feeding them. When the young are fledged, they gather into family parties, which scour the country in search of new feeding-grounds. The song of the storm-cock, as it is frequently called, can be heard to the best advantage on a stormy day in springtime, when the bird sends forth his loud sonorous notes, as though in defiance of the elements. A migratory species, and often snared on its autumn journey through Central Europe, the missel-thrush is not so subject to abnormal variations of plumage as is the song-

thrush. The adult male is greyish brown above, washed with golden on the rump; the sides of the neck are greyish brown, streaked with darker; in the tail the greater part of the outermost feathers are greyish white; the throat is white, finely spotted with brown; and the under-surface buffy-white, closely spotted with black.

Song-Thrush. A favourite in many parts of Europe, the song-thrush (*T. musicus*) is in no degree dependent upon man for its existence, being, at least, as much at home among the surf-beaten rocks of the Hebridean shores, as in the parks and orchards of the south of England. Breeding early in the year, or rather commencing to do so, it rears several broods during the season. Most nests are built of stems of grass and fibrous roots, interwoven with mosses, and lined with clay; but the prettiest we ever saw was entirely constructed of bright green moss. The nest is often placed in a hedge or low shrub, sometimes in a niche in an ivied wall, sometimes in a fruit-tree. Such song-thrushes as rear their young amidst the treeless straths of the north of Scotland are content to build their nests upon the ledge of some convenient boulder of rock, sheltered from the weather. The eggs are bright blue, well spotted with dark brown. The song of the thrush is generally poured forth from the bough of a tree; but in Scotland thrushes often sing from the roofs of houses, and even from a grassy knoll on the hillside. The food of the song-thrush consists principally of earthworms and insects; and this bird confers a great benefit upon the gardener by the warfare which it wages against snails. Near the sea, also, it feeds in the winter upon whelks and other small molluscs, which it obtains upon the rocks of the shore when the tide has begun to ebb. On the other hand, it must be admitted that the song-thrush consumes a great deal of ripe fruit. In Norway it is a special favourite, and holds the same place in Scandinavian poetry that the nightingale does in the songs of other countries. The adult male is dark brown above, tinted with golden brown; the throat is buff; the under-parts being golden or buffy white, closely spotted with brown. The song-thrushes, which breed in the Hebrides, are of a greyer coloration than more southern specimens.

Redwing. The most delightful song to be heard in the solitudes of the forest in Northern Europe is that of the redwing (*T. iliacus*), which generally chants its flute-like melody from the top of a fir-tree. Never nesting in colonies the redwing appears to seek the society of the fieldfare, since one is sure to find a pair of redwings wherever a colony of the latter species exists. Professor Collett says that in the eastern part of Norway the redwing builds its nest in bushes and low trees, but in the barren, treeless portions of the west coast of Norway, like the song-thrush of the Hebrides, it modifies its habits to suit its surroundings; the nest being often placed upon the ground, between stones, on fences, or in stunted birch-trees. Redwings, like other thrushes, show great anxiety if their nest be approached, snapping their bills, and uttering a mournful cry. The eggs of this species are pale bluish-green, profusely covered with greenish brown markings. In the fall of the year, redwings unite in large flocks, and many of them cross the North Sea to the British Isles and Germany, migrating chiefly at night, when they can often be heard passing over the housetops of our towns, calling at frequent intervals to their companions. The redwing is not a very hardy

bird, suffering severely in protracted frost, even while other birds are able to retain sound condition. The explanation of this must be sought for in the fact that it subsists upon worms and other insects rather than upon berries. The adult is olive-brown above; a broad line of buffy white passes over the eye; the under-parts are white, streaked with brown; and the flanks and under wing-coverts are bright rufous.

Fieldfare.

The fieldfare (*T. pilaris*) is the most abundant of all the northern thrushes, alike in the pine-clad valleys and in the regions of birch. It breeds in colonies, and the nests are placed in fir-trees and birches at various elevations, some being as much as fifteen feet from the ground. They are generally



THE FIELDFARE.

built of long, dry, fine grass, with a coating of mud or clay between the outer and inner layers of that material. Professor Collett relates that a fieldfare once nested in a milk-pail inside a dairy, and successfully reared its young; and Mr. Dresser found a nest in a hollow top of a rotten stump, not a foot above the ground. Whenever an intruder approaches their nest, the old birds fly round, uttering loud and harsh cries, and thus attract attention to the whereabouts of their treasure. The eggs of the fieldfare resemble those of the blackbird, being

bluish green in ground-colour, speckled and blotched with reddish brown. The young are fairly tame when they first leave the nest, but soon become shy and wary even on their nesting-grounds. It is possible that their shyness or boldness may depend upon the extent to which the birds are molested. Myriads of fieldfares annually cross the German Ocean to winter in the British Isles and Central Europe; and on one occasion a solitary straggler landed as far west as Iceland. The adult male has the head and hind-neck ashy grey, the feathers of the crown having dark centres; the back and wing-coverts are rich chestnut-brown; the wings and tail blackish brown; the eyebrows whitish; and the under-parts rich ochre, thickly spotted with black.

The Blackbirds.

The birds of the genus *Merula* are true thrushes in all structural characters, and differ from the foregoing chiefly in the important particular that the plumage of the adult male is more or less widely distinct from that of the female. In a number of species the male bird is black or slaty grey. No fewer than sixteen of the species referred to this genus are peculiar to South America; while twelve inhabit Australia, and fourteen are found

in the Oriental region. Nine species inhabit Northern Asia, and two others are well-known European birds. The common blackbird (*M. vulgaris*) does not usually inhabit the most northern parts of Europe, but breeds in most districts of this region, migrating from the colder regions before the approach of winter.

It is resident throughout the year in the south of Spain, Algeria, and the Canaries. During the summer months the blackbird frequents gardens and orchards, nesting in shrubs and hedges, sometimes upon the ground. The nest is composed of grass-stalks and mosses, together with dead leaves; and, under pressure of circumstances, can be completed in a couple of days, the female alone working at the structure. The eggs are bluish green in ground-colour, closely freckled with light brown. The song lacks the compass and variety of the song-thrush, but is nevertheless powerful and well sustained. The blackbird

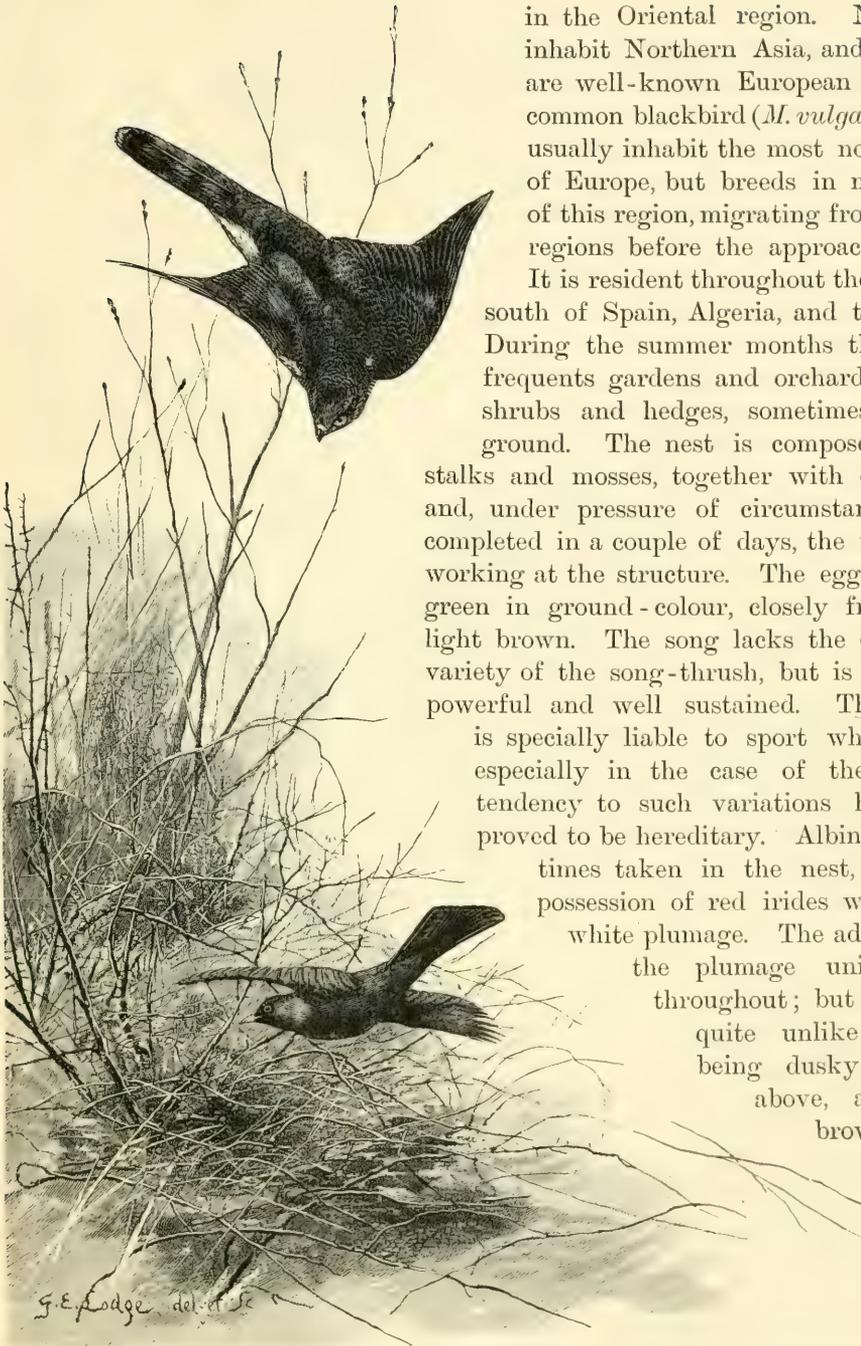
is specially liable to sport white feathers, especially in the case of the male; the tendency to such variations having been proved to be hereditary. Albinos are some-

times taken in the nest, uniting the possession of red irides with bleached white plumage. The adult male has

the plumage uniform black throughout; but the female is quite unlike her mate,

being dusky olive-brown above, and reddish brown on the

under-parts.



BLACKBIRD AND SPARROW-HAWK.

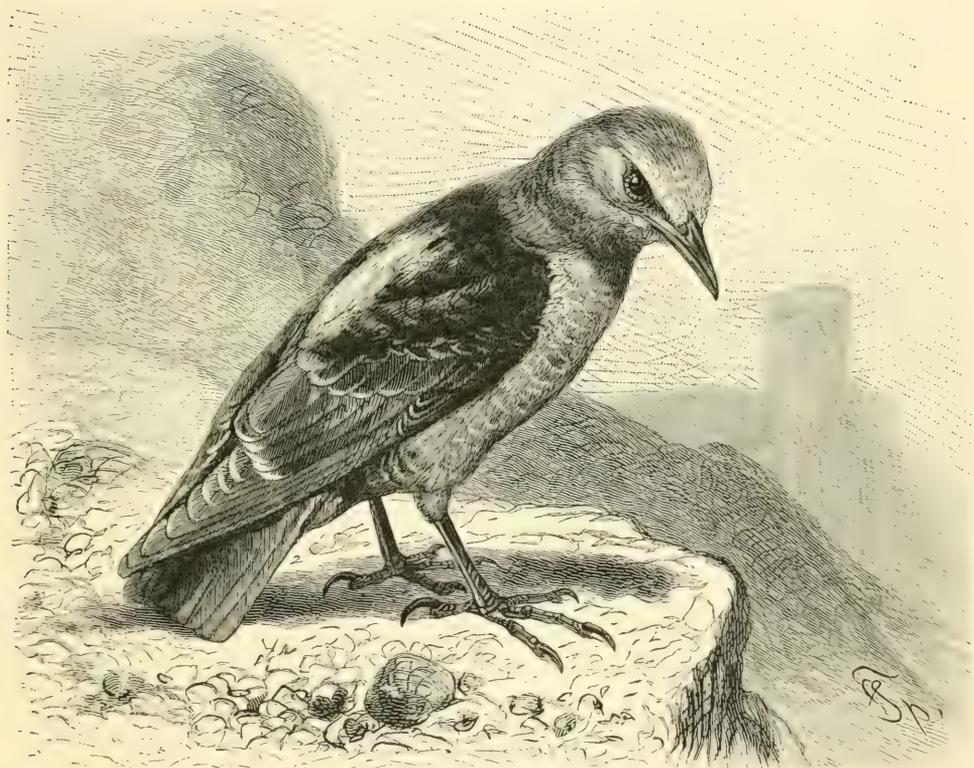
Ring-Ouzel. The ring-ouzel (*M. torquata*), represented in the illustration on p. 472, is a mountain-loving species, spending the summer months among the heaths and pine-forests of the hills of Central and Northern Europe.

In Northern Europe the cock ring-ouzel arrives upon its ground in April and May, and the females soon after join their partners. Generally nesting in some wild solitude, building in the rocks that overhang a mountain burn, especially where the ground is rough and well covered with heather, the ring-ouzel is shy and wary, and rarely permits a very close approach to the nest. In Switzerland, however, a fir-tree is the more common site for the nest, which is always built of dry grass and heather, and lined with fine stems. The eggs are blue, finely spotted with reddish brown. The young occasionally fly as early as the beginning of June. All through the early summer months the ring-ouzels live among the sheep on the hillside; but when the fruits ripen in autumn, the fell-throistles or mountain-blackbirds, as these birds are often called, approach the neighbourhood of orchards and gardens, and proceed to levy blackmail upon the crops. They are especially partial to cherries, though when the berries of the mountain-ash ripen, the ring-ouzels gorge themselves to repletion upon their favourite fruit, so that they become fat and in high condition before they leave the shores of Europe to seek a more genial climate in Northern Africa. Flying strongly and direct, the ring-ouzel utters a song which is both sweet and powerful, and audible at a great distance, although inferior to that of the blackbird. The harsh, chuckling notes which this bird utters when its haunts are invaded cannot well be confused with those of any other bird. Mr. Howard Saunders says that the ring-ouzels, which breed in the Swiss forests, frequent the vineyards by the lakes in the autumn time, levying toll upon the grapes, which the owners guard so jealously. During migration, the ring-ouzel is sometimes found with blackbirds and thrushes at lighthouses. The adult male, in breeding-plumage, has the upper surface blackish brown; the wings being brown with whitish edgings; most of the feathers of the under-surface have pale grey margins; and a broad white gorget extends across the breast, and is always conspicuous.

Rock-Thrushes. The representatives of this small group (*Monticola*) have a stout, straight bill, arched towards its extremity; and while the wings are moderate in length, the tail is short and even. The legs are stout, strong, and well adapted to progression over irregular surfaces. The rock-thrushes are peculiar to the Old World, three species inhabiting South Africa, and a fourth Abyssinia, while two breed in the Himalaya, one of which extends eastward into Western China. The two best known species, the blue thrush and the rock-thrush of Western Europe, range from Northern China to Spain and Italy.

Common Rock-Thrush. The rock-thrush (*Monticola saxatilis*) is a summer visitant to the more barren portions of the principal mountain ranges of Central Europe and Siberia, but does not reach the far north in its annual wanderings. Like its cousin the blue rock-thrush, it is partial to rocky gorges among the hills and regions far removed from any human habitation, save for the chance presence of a shepherd's hut or farmstead in some hollow among the mountains. It is a shy and wary species, constantly vibrating its tail like a redstart, and migrating to its breeding-ground in flocks, where it commences to nest in May. The nest is generally built in a precipitous position among crags of rock, often close to some mountain waterfall; although the rock-thrush sometimes nests in holes in the stone walls that are built to protect the Rhenish vineyards. The nest is

composed of fine roots, moss, and dried herbs; and the eggs are pure light blue, without spots. The young are often reared from the nest by hand, especially in the north of Italy, and are much prized as cage-birds; the song of the rock-thrush being extremely beautiful, though not so fine as that of the blue rock-thrush, which we incline to place first in the rank of European songsters. Timid and fearful as is the rock-thrush in a state of freedom, if reared from the nest it becomes a charming pet: and we have kept both old and young birds, and found them tame and confiding. Although the rock-thrush is a very local and even rare bird in most parts of its range, and does not ordinarily migrate farther north than



ROCK-THRUSH ($\frac{1}{2}$ nat. size).

Central France, stragglers have been identified in Great Britain, as well as in Heligoland. The food of the rock-thrush consists principally of beetles and other insects, but the bird shares the fondness of its congeners for wild berries and garden fruits. The adult male has the head and neck ashy blue; the scapulars are blackish, slightly washed with blue; the centre of the back is pure white; the tail and upper tail-coverts are light red; the entire throat ashy blue: while the rest of the under-parts are rufous orange.

Blue The blue rock-thrush (*M. cyanus*) is chiefly found in the countries bordering the Mediterranean, and is a wild, shy bird of solitary disposition, resident in single pairs in rocky districts. Canon Tristram has shown that this bird is the "sparrow that sitteth alone upon the housetop" of the Psalmist.

Colonel Irby writes that "a pair nested in a hole outside the wall of my stables at Gibraltar, in June 1869. Five eggs were laid, which were hatched about the 20th. The nest was of small dried roots, and was very scanty. When the young were hatched, I broke through the wall from the inside of the stable to the nest, making the hole large enough to admit a small cage, in which I placed the nest and young; over the inside hole I then hung an old coat so as to shut out the light from the inside, cutting a small slit in the coat, through which I used to watch the old birds feeding their young within six inches. Both birds fed them at intervals of not more than five minutes. The food consisted almost entirely of centipedes, with now and then a large spider or bluebottle-fly by way of change. Two of the five young died in the cage, from the old birds not being able to get at them. Of the other three, only one attained maturity, living till October. He was very tame, and of most engaging habits and disposition, in fact what the Spaniards call '*simpatico*.' In his younger days he was fed on soaked bread and bruised snails." The blue thrush is a well-known bird at Rome, at Malta, and in many other European resorts of tourists. Everywhere it frequents rocks, ruins, and old walls, pouring forth its delicious music in solitary wastes. It is a favourite cage-bird, and as such commands high prices; but it is excessively delicate and difficult to keep. The adult male is of a general dull blue above, the head and breast having a silvery gloss, while the under-parts of the body are dull blue. The female differs from the mate, in being greyish brown above, tinted with blue, and reddish buff on the lower-parts.

Bluebirds. Possessing a characteristic plumage of sky-blue (associated with chestnut in two instances), the bluebirds (*Sialia*) are easily distinguished from all other North American birds. The bill is straight and compressed, notched near the extremity; while the wings are pointed and much longer than the tail, which is slightly forked; the feet being stout and short, and adapted for perching, and not for running, as in the chats. Bluebirds are peculiar to the American continent, and have no nearly allied representatives in the Old World. No more charming bird is to be found in the United States than the bluebird or blue robin (*Sialia sialis*), which breeds as far north as Southern Canada, and passes the winter months in great numbers in the Southern United States. It is one of the first birds to arrive in the States in spring, preceding the swallows and many other species; indeed, it is occasionally observed as early as January and February in its summer home. The male is a cheery songster, and all his movements are characterised by grace and energy. The nest is placed in the hollow of some tree; the eggs are pale blue, and unspotted; and several broods are reared in a season. The bluebird is often imported to Europe as a cage-bird, and has often bred in confinement. Mr. A. G. Butler gives the following account of some pet birds of this species: "my blue robins made friends early in June, the cock-bird giving every insect he got hold of to the hen, to induce her to receive his attentions; the hen was very coy, and refused his advances until about the end of the first fortnight; the pairing was a noisy affair, as the cock-bird kept up an incessant shrieking noise, with his body elongated, and his beak turned up to the ceiling, for fully half an hour beforehand, and for quite ten minutes afterwards. On Sunday the 16th of June the hen spent the whole day

in carrying up hay to a large, deep box, nailed against the wall near to the ceiling, and on the surface of this she formed a saucer-shaped depression, in which shortly afterwards she laid three eggs; while sitting she was fed by the cock-bird, but whenever he gave her an insect she invariably left the nest to eat it. In thirteen days the eggs hatched, and two days later two of the young birds were carried out dead; the third bird was safely reared, and moulted into his adult plumage towards the end of August. The young bird left the nest when twenty-three days old. I had been led to suppose that he would resemble the hen; but, in addition to his greatly inferior size and spotted breast, he was altogether of a far more cinereous tint. In about eight or ten days he was perfectly able to feed himself." These bluebirds preferred to feed their young upon insects, which they invariably swallowed and disgorged several times before carrying them to the young. The adult male has the head and upper-parts deep azure-blue; the throat, breast, and sides of the body chestnut; and the lower-parts white; while the female is blue, mixed and obscured with reddish brown.

True Chats. Occupying an intermediate position between the robins and the true thrushes, the chats (*Saxicola*) form a second subfamily characterised by possessing a strong bill and well-developed rictal bristles; the wing is pointed and equal to the tail, and the metatarsus and foot are adapted to their desert-loving habits. Resembling the fly-catchers in the mode of taking their insect-prey, the chats differ from other small birds by their frequent vibration of the tail when perching and running. They are most strongly represented on the African continent, five species inhabiting North Africa, while six are peculiar to the south of the Ethiopian region, and five others inhabit Abyssinia and Nubia. Eight belong to the European avifauna, while four species breed only in Persia, and another four in Turkestan. The wheatear, which may be considered the best known form of the genus, has a straight bill, broadest at the base and slightly curved towards the extremity; the legs and bill being black, and the metatarsus not scutellated. The bastard-primary feather is small, and the wings are comparatively flat and pointed. In all the more typical species, the rump, upper tail-coverts, and the base of the tail are pure white in both sexes: the tail consisting of twelve feathers of nearly equal length. The russet chat (*Saxicola melanoleuca*) breeds in Italy, Greece, South Russia, and Palestine; the western form summering in Morocco, Algiers, Spain, and the south of France. The isabelline chat (*S. isabellina*) breeds in Asia Minor, South Russia, and Siberia, and has been obtained in Madagascar; while the Indian desert-chat (*S. deserti*) passes the summer in the cultivated districts of Turkestan, wintering in North-West and Central India.

Wheatear. One of the earliest of the many migrants that traverse the length and breadth of Europe during their annual migrations is the common wheatear (*S. ænanthe*), so well known in most parts of the British Isles. Arriving in March and April, the wheatear is both a moorland and maritime species. Many may be seen on a Scotch grouse-moor or any sheep-farm in the north of England; and some remain very late in the ploughed fields of the midland counties. Numberless pairs spend the summer months playing about the rabbit-

holes which line the sand-banks that form the coast-line in many districts of Britain. The wheatear builds its nest in a variety of situations; sometimes in a loose heap of stones, sometimes in a rabbit-hole or beneath a heap of dried peats; and we once found a family packed into an old tin pot lying in a hollow of a shingly sea-beach. The eggs are light blue. The song consists of some very sweet notes, generally uttered upon the wing. These birds leave the British



WHEATEAR, WHINCHAT, AND STONECHAT ($\frac{1}{2}$ nat. size).

shores chiefly in August and September, although some commence their journey in July, while other belated stragglers linger on into early winter. The range of the wheatear is very extensive, including, according to season, a great part of Asia north of the Himalaya (including Gilgit), Africa, and North America. The adult male in the breeding-season has the crown and most of the upper-parts greyish blue, the lores and the ear-coverts black, the upper tail-coverts pure white, and constantly displayed; while the tail is black and white, and the throat and under-parts are buffish white.



WHEATEAR, STONECHAT AND WHINCHAT.

Black Chat. The black chat (*S. leucura*) inhabits the rocky districts of Spain, Italy, and North-West Africa, being replaced in India by a closely-allied species. Partially resident in its breeding-grounds, it is only a summer migrant to many districts; and it is essentially a bird of desolate mountains, which it enlivens with its lively, active figure. Preferring the wildest and most rugged situations, it is a shy, cautious bird, avoiding the haunts of men; and as, even when wounded, it generally manages to creep into some deep fissure to die, it is difficult to secure. Brehm states that the male black chat often "either dances about on a precipice or a stone, or runs up the precipice, spreading its tail and wings like a blackcock, nods its head, turns sharp round, rises singing into the air like a tree-pipit, and then gradually sinks with outspread wings to the ground, where it finishes the last strophes of its song in the neighbourhood of the female bird, which quite silently watches the antics of her mate. In all its comical postures it knows how to show its beautiful white tail to the best advantage. If there are any trees or prickly-pear bushes in the mountains, it will also repose on them during the intervals of its dance and song; otherwise it selects the most prominent positions for its resting-places." The black chat builds about the middle or end of April, placing its nest in some hole or fissure of the rock, frequently in a precipitous situation. The nest is large, loosely constructed of dry stalks of grass, and the finer stems of various wild plants, and lined with soft fibres and hair. The eggs are pale light blue, with a zone of pale reddish spots around the larger end. The song of the black chat is wild and sweet, and has been compared, when heard in autumn, to that of the blue thrush, although it is not so loud and clear, and generally concludes with a peculiar churring sound, resembling that of the black redstart. The adult male in the breeding-season has the entire plumage of the upper and lower parts of the body sooty black, with the exception of the rump and upper tail-coverts, which are pure white. The two central tail-feathers are black, and the remainder white, broadly tipped with black; while the under tail-coverts are pure white. The female is a duller bird than her mate, being blackish brown instead of sooty black.

Whinchat. The whinchat (*S. rubetra*)¹ winters in Africa, extending its range farther north than the stonechat in the breeding-season. Passing through Spain in the month of April, it makes its way to the Arctic Circle by the end of May; one of the principal routes by which its spring journey is accomplished lying along the valley of the Rhine, where the species is extremely abundant. The whinchat loves the neighbourhood of grass-meadows, from which the song of the male may often be heard resounding, while his mate is engaged in the duties of incubation. The call-note of the species is loud and monotonous, representing the word "*utick*." The nest, usually placed upon the ground and adroitly concealed, contains eggs of a bluish green colour, often spotted with fine specks of reddish brown. When the young are fledged, they live in a family-party with the old birds, which exhibit the greatest anxiety over the safety of their progeny. Subsisting upon insects, and especially beetles, the whinchat is very partial to warm, sunny situations, especially if they are well bushed and command

¹ By many ornithologists the whinchat and its allies are separated as a distinct genus, *Pratincola*, on account of their broader beak and more numerous rectal bristles.

a southerly aspect. It leaves its home in Central and Northern Europe in August and September, rarely, if ever, delaying its departure into late autumn. The adult male has the crown and upper-parts blackish brown, many of the feathers having light buff edges. The tail is white, banded with blackish brown for the terminal half, while the throat and under-parts are pale fawn colour, varying much in intensity. A conspicuous white eyebrow is also present.

Stonechat.

The stonechat (*S. rubicola*) is found throughout Central and several parts of Northern Europe, being a resident in many places, while to others it is but a summer or winter migrant. During the summer, generally to be found on common lands, chalk-downs, or other open places, the stonechat is an early breeder, nesting in April, and concealing its choice of a site with much care. In Oxfordshire stonechats seem to be very partial to aquatic situations, one old male having haunted a certain wet ditch close beside the Isis for several months during one winter; and they have been known to build at the bottom of a hedge adjoining a flooded meadow. The stonechat builds its nest of moss and dried grass, lining it with feathers and hair; the eggs being pale greenish blue, finely spotted with reddish brown. The stonechat has a short but rather pretty song, and is a somewhat noisy species when its haunts are invaded. The adult male in summer has the entire head and back glossy black, with a white collar; the tail is blackish brown, the outer feathers having the outer web light buff; and the under-parts are rufous, but vary considerably in different individuals. The female is a browner bird than her mate. This group of the genus is represented by several species in India, where they are commonly known as bush-chats.

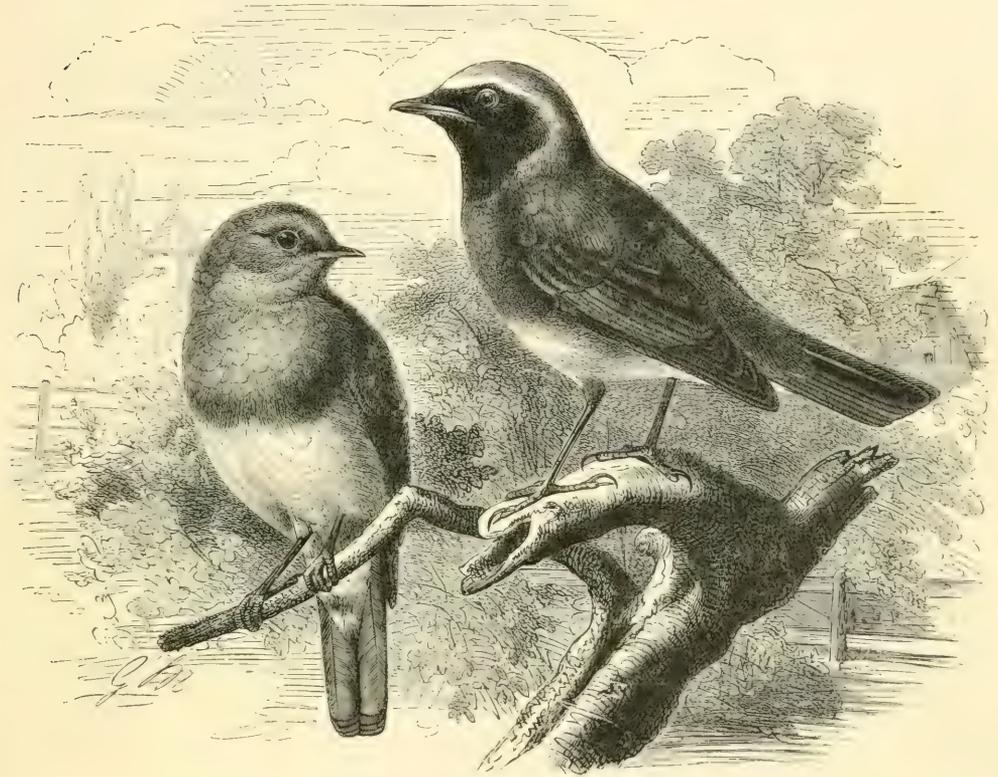
Fork-Tails.

The redstarts and robins, together with the Indian group of fork-tails, bring us to another subfamily (*Ruticillinae*), differing mainly from the chats in their habits; these birds being terrestrial, and capturing their insect-prey on the ground, instead of flying from a perch and returning thereto, after the manner of the fly-catchers. They have a slender, compressed beak, a long metatarsus, and feet well adapted for running; and the majority of the species are denizens of Europe and Asia, north of and including the Himalaya. The first genus of this subfamily is formed by the Indian fork-tails (*Hemicurus*), which are small birds, having the general appearance of pied wagtails, but differing from them in possessing a forked tail and ten primaries, together with a coarse bill. The type has the bill nearly as large as the head, stout and straight; the rictal bristles are well developed: the wing is large, the first primary being about half the length of the second; and the tail is much longer than the wing, and deeply forked; the outer tail-feathers being one-third longer than the innermost ones. Fork-tails are chiefly found in the Himalaya, and generally in the neighbourhood of mountain-streams, but they also range into Tenasserim. All are solitary in their habits, and move their tails incessantly up and down after the manner of wagtails, and are in the habit of generally perching on rocks or bare branches near the ground.

Redstarts.

Exclusively confined to Europe, Northern Africa, and Asia north of the Himalaya, the redstarts (*Ruticilla*) are characterised by the short, slender, black beak, and finely developed rictal bristles, and the black and smooth legs; while most of them have the rump and tail red. In Europe

the genus has half a dozen representatives. Among the prettiest of the summer migrants to Northern and Central Europe is the graceful and attractive bird popularly known as the firetail, or common redstart (*R. phoenicurus*), partial to parks and gardens, and on its first arrival often perching on the lower branches of large trees: the male possessing a very charming song. The redstart commonly builds in a hole in a wall, or the interior of some hollow tree, or upon a shelf in some outhouse; and we once found an open nest of this species placed in the top of a thick bush. The eggs are pale blue, sometimes slightly speckled with red; while the young are easily reared from the nest by hand, and are rather liable



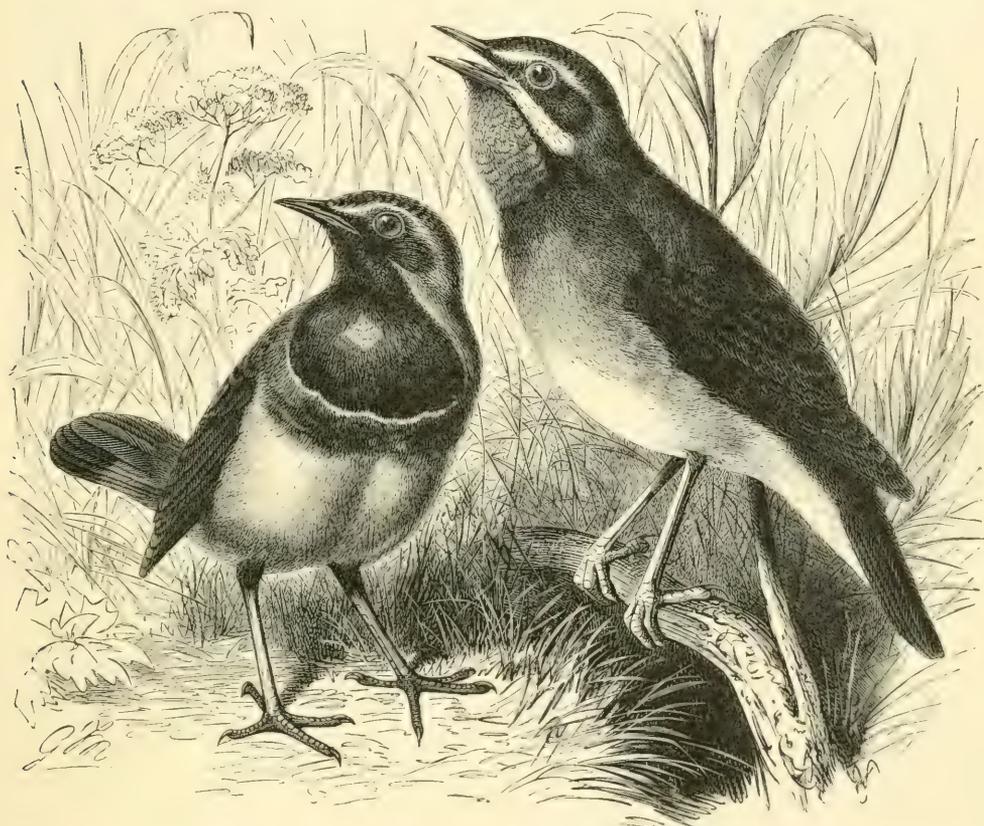
REDBREAST AND REDSTART ($\frac{1}{2}$ nat. size).

to sport a few white feathers in the first plumage. Foraging among dead leaves for insects, they spend more time upon the ground than the young of any of the allied forms. Often rearing two broods of young during the course of the summer, the redstart in its flight is swift and elegant. Although the male birds generally sing from the branches of trees (unlike the male black redstarts), we have known them to sing habitually upon the roof of a house, exactly as the latter would have done. Leaving their breeding-ground in early autumn, stray birds of this species are often to be met with on the British coast at that season when waiting for an opportunity of taking their departure. The adult male, in summer, has the forehead pure white, the top of the head, scapulars, and back leaden grey; the rump and upper tail-coverts are bright chestnut, as is the tail,

with the exception of the two central feathers; the chin and throat being jet black and the lower-parts bright bay.

Black Redstart. The black redstart (*R. titys*) is a well-known bird in many parts of Central Europe, frequently seen even in large cities. Modifying its habits according to the region it inhabits, in Switzerland the black redstart breeds chiefly about the chalets on the mountains, attaching itself to the neighbourhood of farm-buildings, and obtaining most of its food around the outhouses. In Germany it is quite a common garden-bird, dwelling near human habitations, and generally chanting its notes from the gable of a roof. It begins to sing very early in the morning, and continues until late in the evening; no bird being more self-conscious or more frequently seen in a prominent position. The males are pugnacious and desperately jealous of rivals, although they do not perhaps take to fighting quite as naturally as redbreasts. The nest is built of stems of grass, moss, and dry leaves lined with hair and feathers, thus forming a comfortable cradle for the young. The eggs are white, and five or six in number. The female sits very closely during incubation; and when the young first leave the nest, the old birds continue their devotion, and cater for them with unremitting industry. The greater part of their food appears to consist of flies, at least during the finest period of the summer; and even when they first leave the nest the young birds catch midges on their own account. The young of the first brood generally have to be independent of their female parent early, because, as soon as they are qualified to quit the mother, she lays a fresh clutch of eggs; and it falls, therefore, to the male chiefly to feed the fledged young of the first brood, and his usual practice is to take them to the top of a stone wall, or some other sunny place within view of his favourite point of observation, and gradually leave them to shift for themselves. The young that are reared late in autumn have a harder struggle for existence, especially in Switzerland, where the weather often breaks up in August. Black redstarts are birds that like fine weather; and in stormy weather they are apt to become somewhat disconsolate, and sit moping, with their feathers puffed out. In the summer the species is home-loving though certainly somewhat restless, and never seen in the same position for more than half an hour at once. When the season for migration arrives, this redstart loses, however, its domestic habits, becoming shy and unobtrusive, and setting forth on its journey with a restless energy. Although never breeding in the British Islands, many of these birds annually visit the south-western parts of England during the autumn, and even pass the winter under the shelter of cliffs or in the neighbourhood of houses. They generally arrive in Devonshire in parties of two or three in the autumn; while those that winter in England assemble again in March on the coast for their departure. The plumage of the adult male is a dark bluish grey above, with a conspicuous white patch upon the wings; the forehead and throat are black; the tail is chestnut, tipped with blackish brown, excepting, of course, the two central tail-feathers, which are blackish brown throughout; the breast and lower-parts being slaty grey. The female and young males have the upper-parts brownish grey, and lack the black throat of the adult male; the males of the year breeding in the grey plumage just described.

Blue-Throated Warbler. So much difference of opinion prevails among ornithologists as to the generic limitation of the birds here included under *Erythacus*, that it will not be of much use to attempt to define the genus. For instance, while Professor Newton includes the blue-throated warbler in *Ruticilla*, Mr. Oates makes it the type of a distinct genus, *Cyanecula*; and while the same ornithologist separates the nightingales (as *Daulias*) from the redbreasts, Dr. Sharpe places both in the present genus. We accordingly proceed to notice some of the better-known species without further preliminaries. One of the loveliest of all the



BLUE-THROATED AND RUBY-THROATED WARBLERS ($\frac{2}{3}$ nat. size).

group is the blue-throated warbler (*Erythacus succicus*), the Arctic form of which, represented in the woodcut, has the blue gorget spotted with chestnut-red; while on the other hand the variety of the bluethroat breeding south of the Baltic has the throat spotted with white, or even entirely blue without any spots at all. The Arctic form of bluethroat twice annually crosses the length and breadth of Europe, but it is so seldom noticed on migration through Central Europe as to have given rise to suggestions of impossible distances, conjectured to have been accomplished without rest. It should be observed that Mr. Oates, with whom we are disinclined to agree, regards these two forms as specifically distinct. The Arctic bird reaches its northern breeding-grounds at the end of May, and takes up its residence in

willow-swamps and other damp situations. Its song has been compared by Mr. Seebohm to that of several other birds. "His first attempts at singing are harsh and grating, like the notes of the sedge-warbler, or the still harsher notes of the whitethroat; these are followed by several variations in a louder and rather more melodious tone, repeated over and over again somewhat in the fashion of the song-thrush. After this you might fancy that the little songster was trying to mimic the various alarm-notes of all the birds he can remember; the *chiz-zit* of the wagtail, the *tip-tip-tip* of the blackbird, and especially the *whit-whit* of the chaffinch. As he improves in voice he sings louder and longer, until at last he almost approaches the nightingale in the richness of the melody that he pours forth. Sometimes he will sing as he flies upwards, descending with expanded wings and tail to alight on the highest bough of some low tree, almost exactly as the tree-pipit does in the meadows of our own land. When the females have arrived, there comes at the end of his song the most metallic notes I have ever heard a bird utter. It is a sort of *ting ting*, resembling the sound produced by striking a suspended bar of steel with another piece of the same metal. The female appears to shun the open far more carefully than her mate; and while he will be perched upon a topmost spray, gladdening the whole air around him with his varied tuneful melody, she will remain in the undergrowth beneath him gliding hither and thither more like a mouse than a bird through the branches." The nest of the bluethroat is very well concealed in the side of a tussock of grass and is lined with fine roots and hair; and the eggs are olive-coloured. When the young leave the nest, they forage about for insects in the undergrowth, peering at a stranger with the pretty wistfulness of young robins, to which they bear a rough resemblance in their actions. In Spain the bluethroat is to be met with in very dry situations, but that is only when the birds are on migration; and the same is probably true of its occurrence in the arid districts of Ladak. From our own observations the bluethroat seems to migrate singly or in couples, but Mr. Gaetke states that they arrive in flocks upon Heligoland, both in the month of May and in early autumn. On Heligoland they are chiefly to be found in the potato-fields in autumn, while in spring they frequent the gooseberry and currant bushes of the gardens. We have seen bluethroats sheltering in dry scrub on migration; when every now and then a bird would flit out of its cover, dart upon an insect, and then steal away into the recesses of the bushes, to emerge a moment after for another rapid sally. On the Norfolk coast the bluethroat is well known as a September visitant, and has even appeared in considerable numbers when weather-stayed. We met with bluethroats in the neighbourhood of the Lake of Geneva, one of which, with an entirely blue gorget, frequented a garden, although most of those seen inhabited reed-beds in the marshes of the Rhone. The adult male has the upper-parts brown, with a conspicuous white or buff eye-brow; the throat and upper-breast are metallic cobalt-blue, centred with a large spot of pure white or chestnut, a band of black succeeding the blue, bordered by another band of chestnut; the rest of the under-parts being buffy white.

Redbreast.

An inhabitant of the greater part of Europe, the redbreast or robin (*E. rubecula*) is such a familiar and well-known bird as to require but scant notice here. Breeding alike in our gardens and shrubberies and

in the middle of lonely woods, it constructs its nest of dry leaves, moss, and dead grass, lined with a little hair. The eggs are white, blotched and streaked with light red. When the young birds are fledged, they flit about the gardens and outhouses gathering a variety of insects. Many of them migrate in autumn, while others linger to utter their silvery notes during the dead months of the year, drawing near the cottages and farmhouses at the approach of frost. The plumage of the male robin is olive-brown above, tinted with grey; the neck, forehead, and throat being bright orange, the remainder of the lower-parts olive-brown. The robin of the Canary Islands has been classified as a distinct species.



THE REDBREAST.

Another beautiful species of warbler is the rubythroat (*E. calliope*), represented on the right side of the illustration on p. 485, which makes its summer home in the extreme north of Russia and Siberia, breeding among the tundras of the Arctic Circle, after the ice and snow have thawed and disappeared. Mr. Seebohm says that the song of the rubythroat "is very fine, decidedly more melodious than that of the bluethroat, and very little inferior to that of the nightingale. When first I heard him sing I thought I was listening to a nightingale; he had his back towards me when I shot him, and I was astonished to pick up a bird with a scarlet throat. The feathers were as glossy as silk, and when I skinned him I thought I had rarely if ever seen so beautiful a warbler. The rubythroat appears in the south of Siberia as early as the beginning of April. Its nest is said to be a slight structure, and the eggs are olive-grey. It is a bird of shy and solitary habits, frequenting thickets and close cover, and obtaining its food chiefly upon the ground. It loses the brilliant colour of the throat in confinement. It winters in the Philippine Islands, South China, Burma, and Northern and Central India, occasionally straying into Europe. Jerdon once met with a rubythroat on board ship a little south of Bombay, when a single bird of this species took refuge on board his vessel in the month of November. The adult male has the upper-parts of a uniform olive-brown: the eyestripe and cheeks being white; while the chin and throat are glossy scarlet: and the breast ash-grey shading into buffy grey.

The nightingale (*E. luscinia*) is celebrated in Western Europe as an incomparable songster, and has from all times enjoyed just reputation for the perfection of its vocal powers. Wintering in Africa, it reaches its summer home in the British Isles about the 13th of April, the males being the first to arrive. Its range in the British Isles is somewhat circumscribed; and it does not breed north of Yorkshire. The nest is a loose structure of stems of grass

and dry leaves, generally raised a little from the ground by a deposit of dead twigs, and screened from observation by a profusion of wild brambles or a crop of stinging nettles; the eggs being uniform olive-brown or coffee-coloured. The female, though shy, is much devoted to her charge, and will allow a stranger to stand close beside her without exhibiting her agitation further than by a slight nervous movement of the head which only enables him to obtain a better view of the little russet bird, her dark eye beaming out of its whitish orbit. The nightingale is easily trapped, and was formerly an object of eager pursuit among bird-catchers, who used to imitate the cry of the bird in order to lead it up to the trap which they had prepared for it, baited with a live insect. One bird-catcher informed us that he once caught two male nightingales in this manner in less than ten minutes; this occurred, of



THE NIGHTINGALE.

course, in a locality where nightingales were plentiful, and upon the first arrival of the males. When the nightingale has hatched her young both parents become absorbed in catering for their progeny. The song is chiefly heard during the night, simply because other birds are then comparatively silent, but the nightingale sings with great power even during the middle of the day. The male has the upper-parts russet-brown shading into chestnut on the upper tail-coverts and tail; the lower-parts being buffish white shading into greyish white on the breast and flanks.

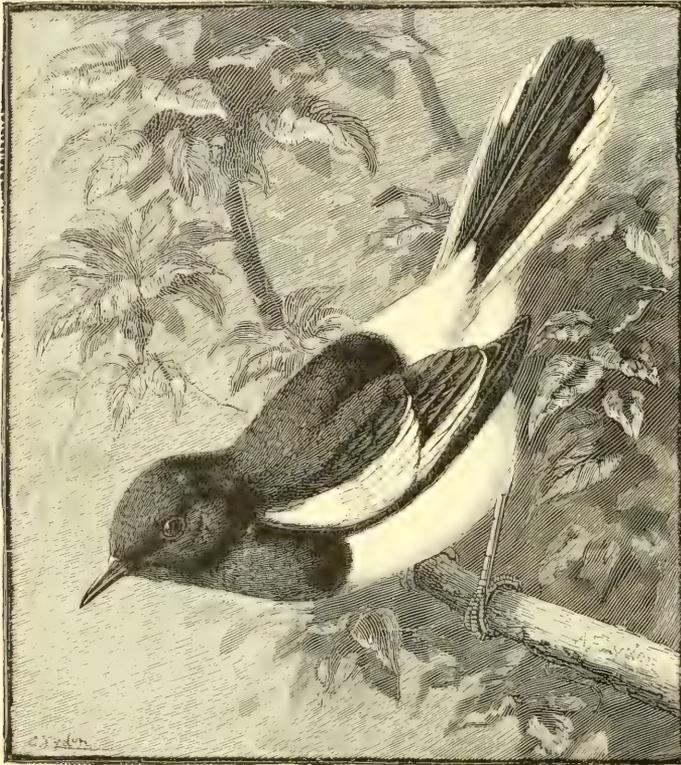
Eastern Nightingale. In the east of Europe the English nightingale is replaced by a somewhat larger bird (*E. philomela*), which has a distinct song, differing from that of its congener in its greater volume and inferior perfection. It breeds generally in thickets in the neighbourhood of water, and builds a similar nest to that of the well-known bird. The plumage of the eastern nightingale differs from that of the common species in being of a more olive-brown, especially on the upper tail-coverts, in having a more pointed wing, a smaller bastard-primary, and in being slightly spotted or streaked on the breast with grey. A third species is the Persian nightingale (*E. golzi*).

New Zealand Robins. Here may be noticed two Australasian genera of birds, placed by some among the flycatchers, but regarded by Dr. Sharpe as allied to the stonechat and whinchat. It should be observed, however, that the same ornithologist separates (as *Pratincola*) the last-named birds from *Saxicola* to place them among the flycatchers. The New Zealand robins (*Miro*) are characterised by having a slender bill, straight, and furnished with rictal bristles: the wings being moderate and extending to half the length of the tail, and rounded: while the tail is broad and even, the feathers being sharply cut off at their tips. The metatarsus is very long and slender. This genus belongs to the avifauna of New Zealand and

the Chatham Islands; the species peculiar to the latter group of islands being entirely black. The North Island robin (*M. australis*) is confined to the gloomy forests of the interior of the North Island; and the following description of its habits is given by Sir Walter Buller, who writes that, "as the popular name implies, it is naturally a tame bird; and in little-frequented parts of the country it is so fearless and unsuspecting of man that it will approach within a yard of the traveller, and sometimes will even perch on his head or shoulder. It is a favourite companion of the lonesome woodcutter, enlivening him with its cheerful notes; and when sitting on a log, he partakes of his humble meal, it hops about his feet like the traditional robin, to pick up the crumbs. Like its namesake in the old country, moreover, it is noisy, active, and cheerful. Its note is generally the first to herald the dawn, while it is the last to be hushed when evening shades bring gloom into the forest. But there is this noticeable difference between the morning and the evening performance; the former consists of a scale of notes, commencing very high and running down to a low key, uttered in quick succession, and with all the energy of a challenge to the rest of the feathered tribe. The evening performance is merely a short, chirping note, quickly repeated, and with rather a melancholy sound; three or four of them will sometimes join in a chirping chorus, and continue it until the shades of advancing twilight have deepened into night. It lives almost entirely on small insects, and the worms and grubs that are to be found among decaying leaves and other vegetable matter on the surface of the ground in every part of the woods. Its nature is pugnacious, and in the pairing-season the male birds often engage in sharp encounters with each other." The North Island robin goes to nest in October and November. The nest is generally against the bole of a tree at a moderate height from the ground, built of coarse moss, lined with fern-hair and vegetable fibres. The eggs are creamy white in ground-colour, thickly freckled, and speckled with purple and brown. It is much to be regretted that this charming little bird has recently become comparatively rare, though the robin found in the South Island is still fairly abundant. The adult male has the upper-parts dull ashy grey, the feathers having whitish shafts; the wings are dark brown, with white bases to the secondaries; the tail-feathers are dusky brown, margined with ash; the throat, breast, and sides of the body are hoary grey; and the abdomen is white.

Dhyal Bird. We come next to a small group of birds closely related to the redstarts and robins, but distinguished from all other members of this subfamily by the black and white tail, equal in length to the wing, and considerably graduated. Peculiar to the Old World, these birds are most abundant in the Indian region; the finest songster amongst them being the white-browed warbler (*Copsychus albospectularis*) of Madagascar, the notes of which rival those of the sweetest European birds. The common dhyal bird (*C. saularis*) of India, represented in the woodcut, occurs in every part of the empire. It is resident in Ceylon and Southern China, but is replaced by *C. mindanensis* in the Philippines. The Indian species is a common and familiar bird throughout its range, exhibiting a confiding and friendly disposition like the European redbreast. The cocks are highly pugnacious in the breeding season, and engage in frequent scrimmages with their rivals. The nest is a rough structure, built in a hole of a tree, in an old

stump, or in the crevice of a wall. The nesting holes of the barbets and woodpeckers are often utilised by the dhyal bird. The male has a pleasing song, not unlike that of the redbreast, but of greater compass. This species is often kept as a cage-bird, and has been trained to turn somersaults at a gesture from its owner. The adult male has the head, neck, breast, and upper-parts glossy black; the wings and



MALACCA DHYAL BIRD.

tail are black, varied with white: and the abdomen and under tail-coverts white. The female has the upper-parts of a uniform dark brown glossed with bluish; the throat and breast are dark grey; and the wings and tail dark brown varied with white.

The shamas.

The shamas (*Cittocincla*) are closely related in structure to the last, from which they are distinguished by the proportionately greater size of the tail, which considerably exceeds the wing in length. The shamas are shy and retiring birds, avoiding the neighbourhood of

houses, and obtaining their food in the woods and jungle. The black shama (*C. nigra*) inhabiting the Malayan region, is a skulking species, haunting the dense cover near to the coast. One has been recently discovered in the Philippines (*C. cebuensis*); while the Andaman shama (*C. albiventris*) is peculiar to the islands from which it takes its name. The best known is the Indian shama (*C. macrura*), a permanent resident in the plains of India, and a timid but graceful bird, much sought after by Indian bird-catchers, on account of its beautiful song. For this reason the shama is often imported into Europe as a cage-bird, but it is delicate, and requires care in the colder climate of Great Britain. The shama nests from April to June, retiring into the depths of the jungle, and constructing its nest of grass and dead leaves in the hollow end of the broken branch of a tree. The eggs are greenish marked with reddish brown, and vary in number from three to four. The adult male has the head, breast, back, and wing-coverts black; the rump and upper tail-coverts are white; the tail-feathers are black and black-and-white; and the abdomen and under tail-coverts bright chestnut.

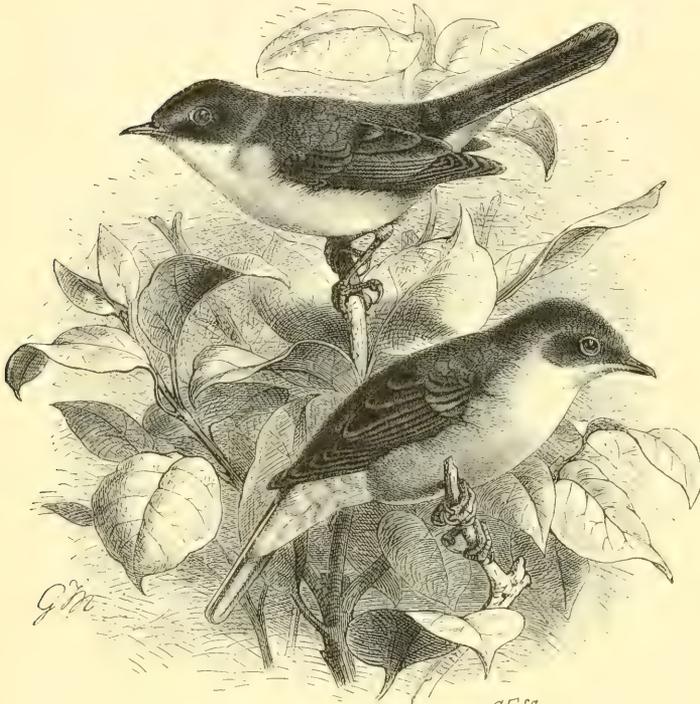
The glossy black and chestnut colours of the male are replaced in the female by dark brown and pale rufous.

Grey Warbler. The grey warbler and its congeners (*Gerygone*) possess a slender straight bill slightly curved and compressed; the wings are rather short and rounded; the tail is long and rather rounded; and the metatarsus long and slender. The birds of this group are found in Australia and New Zealand, ranging also to New Guinea and adjacent islands. The grey warbler (*G. flaviventris*) is mentioned here, because it performs the function of a foster-parent for the young of the two species of cuckoos found in New Zealand. It is a bird of sombre plumage and unobtrusive habits, but utters at short intervals a note of much sweetness; and is plentiful in every part of New Zealand, where it appears to be as much at home in the woods as in the open scrub. Its food consists of small insects, which it obtains in the leafy tops of forest trees as well as in the dense foliage of thick bushes. Sir Walter Buller says: "In the Hot Lakes district I have found it flitting round the steaming geysers, apparently unaffected by the sulphur-fumes, and catching the minute flies that are attracted thither by the humid warmth. Down by the seashore its note may be heard in the low vegetation that fringes the ocean beach; whilst far up the mountain-side, where the scrub is scarce and stunted, it shares the dominion with the ever-present *Zosterops*. Its sweet thrilling warble is always pleasant to the ear, being naturally associated in the mind with the hum of bees among the flowers, and the drumming of locusts in the sunshine." The grey warbler is remarkable for the form of its nest, which is a domed structure, belonging to one of two types—the bottle-shaped nest with a porch entrance, and the pear-shaped form without a porch. The materials used in nest-building are dry moss, grass, vegetable fibres, and spider-webs. The eggs are white, often spotted with red. The grey warbler is an attentive parent to the young of the cuckoos, which are foisted upon it; and probably owes its preservation to the fact that it builds a pensile nest, out of the reach of rats and other vermin. The adult male is olive-brown above; the sides of the neck are dark ashy grey; the tail feathers are ashy brown, shaded with black; and the throat, breast, and sides cinereous grey.

The True Warblers. While the chats, redbreasts, nightingales, and other members of the subfamily *Ruticillinae* are included by Mr. Oates among the *Turdidae*, the true warblers and their kindred are regarded by the same ornithologist as constituting a separate family, *Sylviidae*. On the other hand, Professor Newton includes the *Ruticillinae* in the *Sylviidae*: thus showing how very close is the resemblance between the true warblers on the one hand and the thrushes on the other. Accordingly, we prefer to follow Dr. Sharpe in including all those birds under one great family, of which the true warblers will constitute a separate sub-family (*Sylviinae*). Having thus indicated how extremely difficult it is to separate the thrushes and their allies from the true warblers (*Sylvia*), it may be mentioned that the latter are generally of small size, and usually of plain-coloured plumage. More insectivorous in their habits than the thrushes, and also more migratory in their movements, they usually possess slender bills, adapted to the pursuit of insects. Their wings are variable in size: and the feet slender, and furnished with fine toes. The young of the warblers, unlike those of the typical thrushes, do not

differ materially from adults in colour. This group of birds, in common with the *Ruticillinae*, is of almost universal distribution, but so preponderates in the Eastern Hemisphere, that Mr. Wallace describes it as an Old World assemblage only meagrely represented in North America.

Whitethroat. The common whitethroat (*Sylvia rufa*) is one of the most abundant of summer birds throughout Europe, arriving in its



LESSER AND COMMON WHITETHROAT ($\frac{1}{2}$ nat. size).

breeding-haunts in April, and speedily commencing to make its artless nest, composed of dry stems of grass and flowering plants, lined with finer bents and sometimes a little horsehair. The eggs are white, mottled with olive-green specks. The male sings noisily upon the wing, generally starting up from the top of a hawthorn hedge, and then slowly descending, with the tail at an angle to the body. It may frequently be seen picking small moths off the blossoms of the gorse, as it flits actively from one plant to another, and utters a harsh

croak. The adult male has the upper-parts greyish brown, the wing-coverts and innermost secondaries being edged with chestnut, the outer tail-feathers margined with white, and the lower-parts buffy white.

Lesser

Whitethroat. The lesser whitethroat (*S. curruca*) is a scarcer bird than the last, but its pretty song may be heard about the hedgerows and bushes in many parts of Europe. The nest is placed in a bush or shrub, firmly built of strong bents, lined with finer bents, fibre, and horsehair: the eggs being white, spotted with olive-brown. The lesser whitethroat is very partial to gardens, this being partly accounted for by its fondness for fruit, which is especially manifested when raspberries become ripe. It becomes very tame in confinement, and eats pears and other fruit with avidity. The adult male has the upper-parts slaty grey, suffused with brown on the back, the wings and tail are brown: the under-parts white, the breast tinged with pink, and the ear-coverts dark brown, and conspicuous.

**Subalpine
Warbler.**

The subalpine warbler (*S. subalpina*) has a wide range, inhabiting the whole of the Mediterranean region, as well as North Africa and

the Canaries. It is an agile bird, building a globe-shaped nest, placed in thick bushes, and situated from three to five feet above the ground, which is built of stems of grass, lined with fine fibres. The eggs are greenish white, finely spotted with brown. The subalpine warbler is full of activity, and flits about the bushes catching insects. The adult male has the upper-parts slaty grey, the wings are brown, with pale edges, the tail brown, with more or less white on the outer feathers, and the throat and breast chestnut, shading into paler chestnut on the flanks, and to nearly white in the centre of the breast.

Spectacled Warbler. This pretty little bird (*S. conspicillata*) is another Mediterranean species, resident in some parts of its habitat, and in others a summer visitant. A migrant in the north of Spain, it is there somewhat shy and retiring, flitting about the roadside in a furtive, uneasy fashion, and quite solitary. The spectacled warbler builds its nest in a small bush about a foot from the ground, and the eggs are white, blotched with green. The short, sweet song has been compared to that of the goldfinch. The adult male has the crown slaty grey, shading into greyish chestnut on the centre of the back; the wings are dark brown, edged with chestnut, the tail-feathers dark brown, the outer ones being partially pied; while the chin is white, fading into slaty grey on the throat, which again fades into vinous red on the breast and flanks.

Sardinian Warbler. Another South European bird is the pretty black-headed Sardinian warbler (*S. sarda*), an active, restless species, partial to the neighbourhood of undergrowth. It builds in a branch of some tree, generally at a small distance from the ground; and constructs its nest of blades of grass and roots lined with fine bents. The eggs are greenish white blotched at the larger end with greenish grey. This warbler is common in the pine-woods around Cannes, as also in the gardens near the sea; and its habits have been compared to those of the whitethroat. The male sings from a bush, and then darts off in a jerking flight into the air still singing; while the old birds, like the blackcap, simulate the appearance of being injured when they find their young endangered, trailing their wings in the dust and exhibiting the greatest distress. The song is not unlike that of a garden-warbler, but is more intermittent. The plumage of the adult male is slate-grey above, shading into black on the nape, head, and ear-coverts: the wings are dark brown edged with grey, and the tail is dark grey tipped with white, the throat being white fading into greyish white.

Orphean Warbler. The orphean warbler (*S. orphea*) is one of the larger representatives of the group in Europe, which it visits in April, not continuing its journey north of the Baltic. Mr. Seebohm writes that "the song is louder than that of the blackcap, but I thought it somewhat harsher. Its alarm-note is very loud, as loud as that of the blackbird. In the Parnassus I found it very common, and obtained thirteen nests between the 3rd and 21st May. They were easy to find in the bushes which were scattered over the rocky ground above the region of the olive and the vine: but when we got into the pine-region they disappeared. My friend Captain Verner informs me that he has found nests of this bird in Spain placed near the summit of young cork-trees, about twelve feet from the ground. The nest is a tolerably substantial one and deep, composed of dry grass and leafy stalks of plants. Inside it is built of finer grasses, and lined sparingly with thistle-

down on the flower of the cotton-grass. . . . The ground-colour of the eggs of the orphean warbler is white, sometimes faintly tinted with grey and sometimes tinted with brown. . . . The colour of the overlying spots varies from olive-brown to nearly black." The orphean warbler is a large form of the blackcap, and decidedly more elegant in shape than that species. The adult male has the crown sooty black; the general colour of the upper-parts is dull slate-grey: the wings and tail are brown, and the under-parts white shading into grey upon the breast and flanks.



RUFIOUS AND ORPHEAN WARBLERS ($\frac{1}{2}$ nat. size).

Garden Warbler. A more skulking species than the last is the garden-warbler (*S. salicaria*), which arrives in its summer haunts in Europe about the same date as the blackcap. It is rather a retiring bird, and is consequently often overlooked. It has a sweet song, generally poured forth from the centre of some thick bush or other cover; its nest is of dry stems and moss, lined with fibres and a few hairs; its eggs are greenish white blotched with grey and olive-brown. The garden-warbler is partial to fruit, but we have not seen it strip the berries from the elder-bushes in the same way as the blackcap. The adult male has the upper-parts olive-brown, darker and greyer on the wings and tail; and the under-parts greyish white.

Blackcap. Among the sweetest songsters that visit the gardens and shrubberies of Europe is this slim and attractive species (*S. atricapilla*), which arrives in the British Isles in April, and at once takes up its abode in

orchards and woodlands. The male bird upon its first arrival frequently sings in highly exposed situations; indeed, he can hardly do otherwise, since in backward seasons his progeny are hatched before the leaves of many trees have unrolled. The female constructs her nest of dry stems of grass and fibres, lining it with fine roots and hair; the eggs being generally yellowish brown, clouded with a darker colour. The song of the blackcap is rich and well sustained; and from the rich quality of its notes the bird has been termed the Norfolk nightingale. The blackcap is a most anxious parent, exhibiting lively distress if the safety of the young



BARRED WARBLER, GARDEN WARBLER, AND BLACKCAP ($\frac{1}{2}$ nat size).

be menaced. The young feather very rapidly and leave the nest proportionately earlier than do many other birds. In July the song of the blackcap becomes soft and subdued, and the bird then sings in close cover, shunning notoriety. The blackcap is a favourite cage-bird: we have seen hundreds caged in Paris, and many more in Berne and other continental cities. In the Canaries there occurs a curious variety in which the black of the cap extends over the nape and shoulders as well as round the throat. The typical adult male has the forehead and crown pure black, the upper-parts bluish grey, suffused with olive-brown, the wings and tail brown; while beneath it is bluish grey. The female has the cap of a rusty red: and in captivity sings sweetly, although less powerfully than her mate.

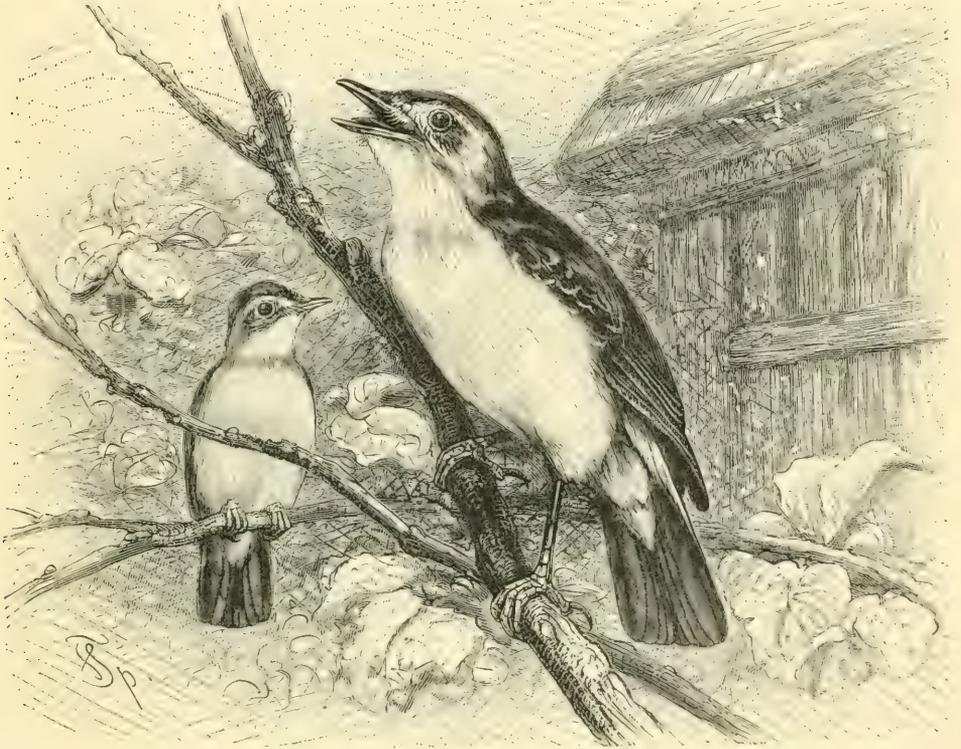
The barred warbler (*S. nisoria*) arrives in its summer quarters **Barred Warbler.** in Europe somewhat later than the majority of migrants, and takes up its abode chiefly in gardens; constructing a bulky nest, more compact than that of most warblers, of roots and dry stems neatly lined with horsehair or fibres. The nest is generally built in a thorn bush not far from the ground, and the eggs are buffish white spotted with brown and ash-colour. The barred warbler is shy and skulking in its habits, and even in confinement it retains this shyness, although this does not extend to birds reared from the nest. The adult male has the upper-parts brownish grey; the under-parts being greyish white, finely barred with brown.

The Dartford warbler (*S. vadata*)¹ is a resident but local bird **Dartford Warbler.** in the temperate parts of Europe, breeding also in the mountains of Algeria. It is a small, retiring species, fond of thick covert, and used to be tolerably common even in the neighbourhood of London until exterminated by several severe winters. Mr. Swaysland wrote to us in 1883: "I have taken several hundreds of eggs of the Dartford warbler within a few miles of Brighton, but the birds were all exterminated in a recent severe winter. I have not heard of any since, though formerly we could find a dozen pairs within a few miles. I have taken the eggs of a single pair three or four times in a season. If the nest contained three eggs when I first robbed it, the next clutch usually contained five eggs, but if it contained four eggs the first time the second laying usually consisted of the same number." The Dartford warbler builds a very slight nest, composed of dry stalks and lined with finer stems added to a little wool. The nest is usually extremely difficult to find, and can only be discovered by patient observation of the old birds. Mr. Newman often observed the Dartford warbler in the neighbourhood of Godalming, and has left the following sketch of its winter habits:—"When the leaves are off the trees, and the chill winter winds have driven the summer birds to the olive-gardens of Spain or across the straits, the furze-wren is in the height of its enjoyment. I have seen them by dozens skipping about the furze, lighting for a moment upon the very point of the sprigs and instantly diving out of sight again, singing out their angry impatient ditty for ever the same. They prefer those places where the furze is very thick, high, and difficult to get in." The egg of the Dartford warbler is white or buff in ground-colour, suffused with olive or reddish brown. The song of the male is lively, and often uttered upon the wing. The nestlings which Montagu reared began to sing as soon as they assumed adult plumage. The plumage of the adult male is very dark sooty brown, shading into slate-grey on the head; tail dark grey, the outside feathers tipped with white; the under-parts are chestnut-brown, shading into white on the centre of the belly, and having the feathers of the chin and upper throat tipped with white; the under tail-coverts are grey tipped with white.

The Willow Warblers. The yellow-browed warbler (*Phylloscopus superciliosus*) figured on p. 505, is an example of a genus differing from the preceding by the supplemental bristles in front of those of the rictus of the gape being stronger and more numerous, while the beak is short and stout. The genus includes the chiff-chaff (*P. collybita*), wood-wren (*P. sibilatrix*), willow-wren (*P. trochilus*), etc. The yellow-browed warbler passes the summer in North Siberia, where Mr. Seebohm

¹ Frequently separated generically as *Melizophilus*.

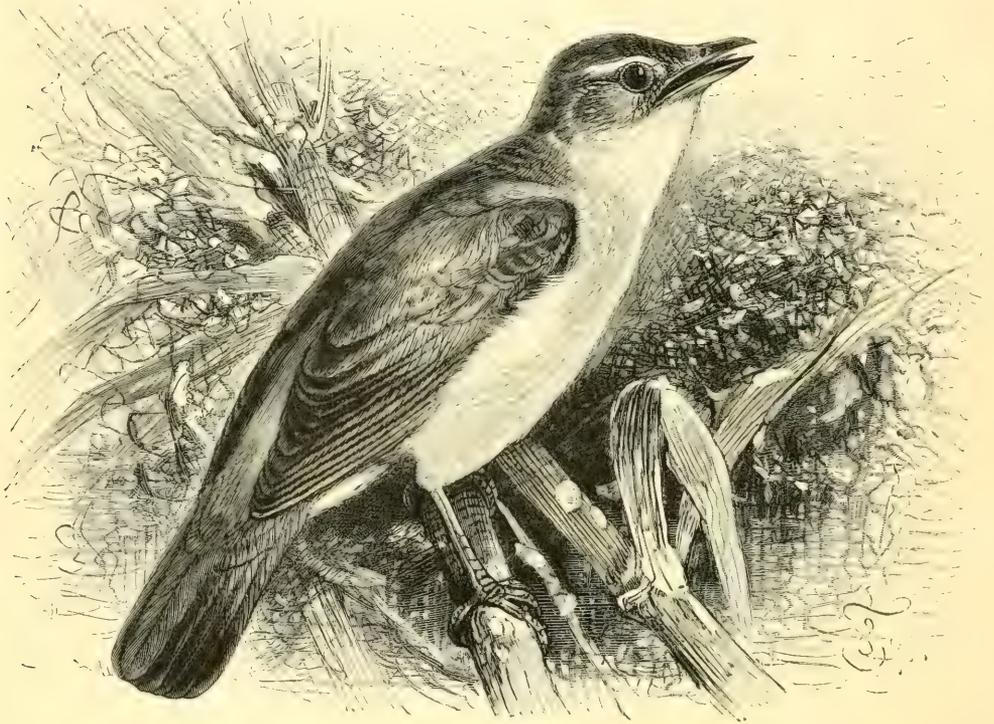
first discovered its eggs, of which he gives the following account:—"As we were walking along a little bird started up near us, and began most persistently to utter the alarm note of the yellow-browed warbler, a note which I had learned in Gaetke's garden in Heligoland. As it kept flying around us from tree to tree we naturally came to the conclusion that it had a nest near. We searched for some time unsuccessfully, and then retired to a short distance and sat down upon a tree trunk to watch. The bird was very uneasy, but continually came back to a birch-tree, frequently making several short flights towards the ground, as if it were anxious to go into its nest but dare not whilst we were in sight. This went



ICTERINE WARBLER ($\frac{2}{3}$ nat. size).

on for about half an hour, when we came to the conclusion that the treasure we were in search of must be within a few yards of the birch-tree, and we again commenced a search. In less than five minutes I found the nest with six eggs in it. It was built in a slight tuft of grass, moss and bilberries, semi-domed exactly like the nests of our willow-warblers. It was composed of dry grass and moss ends lined with reindeer hair. The eggs were very similar in colour to that of our willow-warbler, but were rather more spotted and smaller in size. The yellow-browed warbler occasionally straggles into Europe on the autumnal migration. The adult male has the upper-parts olive-green: a well-defined narrow greenish yellow eyestripe extends over the eyes; the wing-coverts are tipped with yellow forming two bars across the wings, the wing quills and tail are brown, the lower-parts white suffused with yellowish green.

As an example of another genus differing from *Sylvia* by the length of the beak from the gape exceeding (instead of falling short of) the third toe and its claw, may be mentioned the icterine warbler (*Hypolais philomela*); eight other species of the genus being known. Annually visiting temperate Europe south of the Baltic, the icterine warbler is a graceful slender bird, and on its first arrival may be observed flitting actively about the lower branches of trees and bushes in quest of insect prey. Although in coloration this warbler bears some resemblance to the willow-warblers, it does not form a dome to its nest like those birds, nor does it build near the ground. On the contrary, its pretty nest is of dry stems of grass interwoven with moss, wool, and other materials, in some small tree, generally eight or ten feet from the ground. The eggs are brownish



THE REED WARBLER.

pink in ground-colour, spotted with dark purplish brown. Mr. Seebohm gives the following description of the song of the icterine warbler:—"Perhaps on the whole the song of the common tree-warbler comes nearest to that of the marsh-warbler, but often it reminds you strongly of the sedge-warblers. At other times you may trace a fancied resemblance to the chirping of the sparrow, the scolding of the whitethroat, or the scream of the swift." The adult male in spring is olive-green above, the wings and tail are brown, the under-parts are uniformly of a very beautiful and delicate yellow. The female is identical in plumage with her mate but rather duller.

Yet another genus (*Acrocephalus*) of warblers is typically represented by the reed-warbler, and is distinguished from all the foregoing

Reed Warblers.

by the feathers of the forehead being short and rounded, instead of disintegrated and with elongated shafts. Moreover, there are no hairs or bristles on the forehead, with the exception of the ordinary ones at the rictus of the gape. In this particular genus of the group, displaying the above characters, the first primary quill of the wing is much less than one-third the length of the second, while the rictal bristles are strongly developed, and the tail is but slightly graduated. The reed-warbler (*Aerocephalus streperus*) is an annual visitor to most parts of temperate Europe, arriving in April and May, and generally taking up its abode in extensive morasses. The nest is a singularly beautiful structure, built in the middle of a wood a long way from water; one which we found was composed of delicate green moss; while another from Romney Marsh was almost wholly constructed of sheep's wool. The eggs are greenish white in ground-colour, clouded or freckled with dark olive. The song of this warbler is rich and much varied. The adult male in spring has the upper-parts rufous brown, the colour being most pronounced upon the rump and upper tail-coverts, while the chin and throat are dull white, and the breast and flanks pale buff.

The sedge-warbler (*A. schoenobænnus*), shown on the left figure on p. 501, is common in many parts of Europe, arriving in April from North Africa, and speedily taking up its residence in some suitable haunt, generally a scrub near the waterside. It generally departs again for the south in September, wintering in Africa. Its song is loud and varied, and often delivered during the stillness of a summer night. The nest is a slight structure, of dry stems without any lining, or of dry stems and a little green moss, lined with the feathers of the gadwall. The eggs are yellowish brown. The adult male in spring has the upper-parts rusty russet-brown, with dark centres to the feathers, the eyestripe being buffish white; while the wings and tail are brown, and the under-parts buffish white.

Grasshopper-warbler. Nearly allied to the last, the grasshopper-warblers (*Locustella*), of which there are some eight species, may be distinguished by the smaller development of the rictal bristles, as well as by the more markedly graduated tail, in which the outermost feathers are less than three-fourths the total length. They derive their name from their peculiar chirping notes. The grasshopper-warbler (*L. naevia*) is a regular but local summer visitant to Europe, arriving in Britain in the month of April in small flocks which soon break up, each pair taking up its residence in some sequestered nook either on a heath on the margin of large woods or in the bottom of a deep hedge. On its first arrival the hedges are generally bare or nearly so, a circumstance which naturally facilitates the observation of the movements of this shy bird. Both the male and female sing, but most of the ventriloquising efforts proceed from the male bird. The grasshopper-warbler sings its curious song principally during the early hours of day and shortly before dusk, although it would be a mistake to suppose that it does not sing at other times, for it often sings lustily in the middle of the day. The nest is cunningly concealed in thick herbage; the best plan of discovering its whereabouts being to visit the spot, which the birds are known to frequent, shortly before sunset. If every likely corner be thus explored with the aid of a long stick, the female will almost certainly be detected in the act of slipping

off her eggs, creeping away through the undergrowth with the stealth and rapidity of a mouse. The eggs are pinkish white freckled with darker reddish brown. The adult male has the upper-parts olive-brown with dark centres to the feathers,



GRASSHOPPER, RIVER, AND SAVI'S WARBLERS ($\frac{2}{3}$ nat. size).

while the chin and centre of the belly are white, shading into buffish brown on the breast and flanks.

Among the finest of European songsters is the river-warbler
River-Warbler. (*L. fluviatilis*) of Eastern Europe, which spends the summer months on the shore of the Elbe, the Danube, and other large rivers, where it frequents thickets and dense undergrowth, building a cup-shaped nest of dry stems. The eggs are greyish white, spotted with reddish brown. The song for which the river warbler is remarkable has been compared to the chirping of grasshoppers: during the early hours of the day the bird sometimes sings in exposed situations, but under ordinary circumstances skulks in the most impenetrable thickets. Both sexes have the

upper-parts uniformly dark olive-brown with a scarcely perceptible eyestripe, the under-parts being greyish brown, shading into white on the throat and belly.

Savi's Warbler. One of the rarer and more interesting of European warblers is the little obscurely coloured bird known as Savi's warbler (*L. luscinoides*), which nests in Holland, building a nest of blades of dry sedge firmly interwoven, which cannot well be mistaken for that of any other bird. The eggs are white, sprinkled with ashy brown spots. In the Rhone marshes this bird may be observed actively running up and down the reeds, occasionally uttering a curious cry which has been compared to that of a tree-frog. The male has the upper-parts uniform russet-brown, and the under-parts are pale buffish brown, shading into nearly white on the centre of the throat and belly.



EDGE-WARBLER, CETTI'S WARBLER, AND FAN-TAIL WARBLER ($\frac{1}{2}$ nat. size).

Cettian Warblers. Cetti's warbler (*Bradypterus cetti*) may be taken as the best known European representative of another large group of genera differing from all the foregoing in having only ten (in place of twelve) tail-feathers. As the number of these genera is far too large to be even mentioned here, it will suffice to say that Cetti's warbler holds a high position among the song-birds of Southern Europe, and that it passes the summer in the Mediterranean region, inhabiting close and impenetrable covert during its summer sojourn. It builds its nest of dry stems and blades of grass in the neighbourhood of water. The eggs are brilliant red, and without any spots. In some parts of its range

Cetti's warbler is resident throughout the year. It sings in every month, and it is somewhat startling in winter to hear a loud and abrupt burst of song, resembling that of a nightingale, from a thick bush. The adult male has the upper-parts rich russet-brown; the eye stripe is greyish white, but indistinct; the wings and tail are dark russet-brown; the chin and throat are white, shading into ashy grey on the sides of the breast, and into brownish grey on the flanks and upper tail-coverts.

To the same group belongs the Australian pheasant-tailed warbler (*Stipiturus malacurus*), distinguished by the elongation and peculiar structure of the three central pairs of tail-feathers.

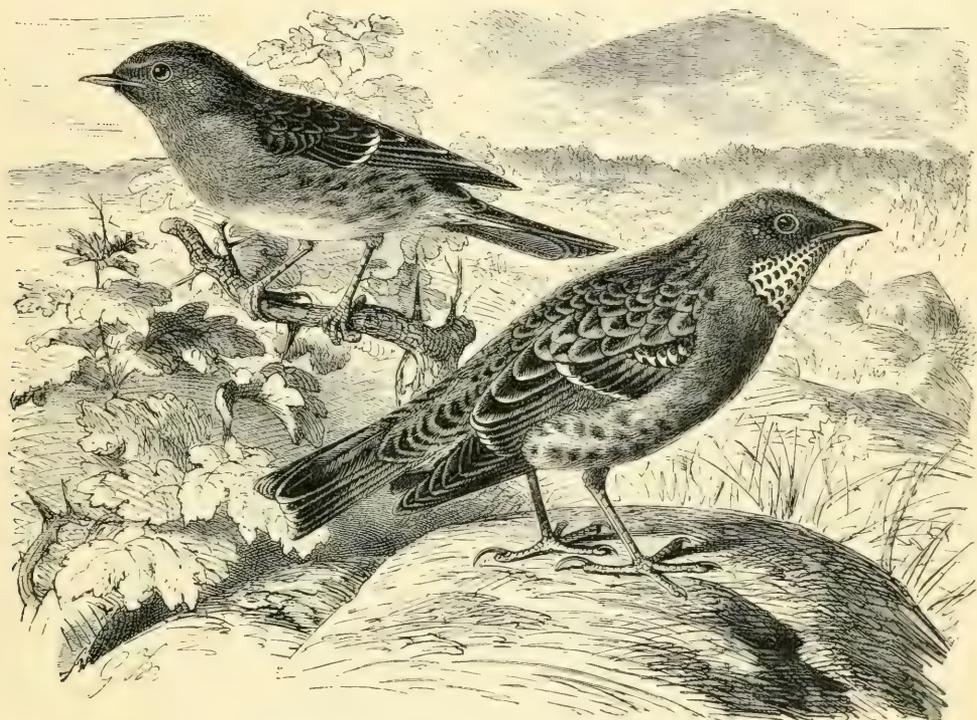


PHEASANT-TAILED WARBLER.

Fan-Tail Warblers. Another group is represented by the fan-tailed warbler (*Cisticola cursitans*), which is one of the smallest of the European reed-warblers, and is easily recognised by its curved beak and fan-shaped tail. It appears to reside all the year through in many parts of the Mediterranean countries, constantly frequenting swampy grounds, and obtaining its food near water.

Accentors. The members of the genus *Accentor* possess a fairly strong bill, broad at the base, with a nearly straight culmen, about half the length of the head; the wings being long and pointed, and the tail nearly square. The legs and feet are strong and generally adapted to progression over rocks and rough surfaces; while the plumage is generally dark brown, varied with rufous. Belonging to Europe, North Africa, and Western Asia, the accentors usually inhabit mountain ranges, although the hedge-sparrow frequents bushes and scrub. Common among the mountains of Europe, the Alpine accentor

(*A. collaris*) inhabits the Pyrenees and Alps, occasionally wandering far from its usual haunts, and reaching the British Islands and Heligoland. It begins to build in May; the nest is round, somewhat shallow, fairly compact, and composed mainly of dry grass stems and very small pieces of moss, the inside being lined entirely with the same kind of moss and the small white feathers of the ptarmigan. The eggs are light greenish blue and unspotted. The adult male has the head and neck grey; the upper-parts are dark brown with light brown edges; the wing-



HEDGE-SPARROW AND ALPINE ACCENTOR ($\frac{1}{2}$ nat. size).

coverts tipped with white; the throat white spotted with black; and the breast and under tail-coverts dark grey, shading into rich chestnut upon the flanks.

Hedge-Sparrow. Although generally nesting in the vicinity of dwelling-houses, the hedge-sparrow (*A. modularis*), which is very widely distributed in Europe, may be found in Spain living far away in the depths of the forest. Its cheery song is often uttered from the top of a small shrub or spray of hawthorn; and, as it is an early breeder, its eggs are often laid before the leaves of the hedges have sufficiently expanded to save them from being chilled by heavy showers of rain. The nest, built of fine roots and moss, is placed in the shelter of a hedge on a bank, under a hawthorn bush, or in the side of an ivied wall, and generally contains four or five blue unspotted eggs. The young when first hatched are invested with black down, but they feather rapidly. In the Hebrides, the hedge-sparrow nests in the sides of burns, adapting its existence to a moorland life. During the winter-time, this bird obtains most of its subsistence in gardens, and may often be seen stealing in and out among the growing plants like

a mouse. Its call-note is loud but monotonous. The hedge-sparrow is very subject to variation of plumage, specimens being often seen prettily pied with white, sometimes symmetrically arranged, while pure white specimens are occasionally met with. The adult has the head and sides of the neck bluish grey, purest in the breeding-season; while the wings and tail are dusky brown, the back reddish brown streaked with darker brown, and the chin and throat grey, the lower-parts being white. Altogether, thirteen representatives of the genus are known.

While some ornithologists refer the accentors to one distinct family (*Accentoridæ*) and the goldcrests to a second (*Regulidæ*), we prefer to follow Professor Newton in including both in the same family as the warblers, as is done in his edition of *Yarrell's British Birds*. In addition to their small size, the goldcrests (*Regulus*) are characterised by the straight and slender beak, which is compressed towards the point, where it is notched. The basally-placed nostrils are covered by a single bristly feather, and there are numerous bristles at the rictus of the gape. The rather long wings have the first primary nearly half the length of the second, which is somewhat shorter than the third, and this exceeded in length by the fourth and fifth. The tail has twelve feathers, and is slightly forked; the legs are long and slender, with elongated claws. An inhabitant of the pine-forests of Europe, the tiny goldcrest (*R. cristatus*) is an exceedingly hardy bird, contriving to obtain subsistence when others are famishing with hunger. During the summer months it haunts gardens and the skirts of woods, building its beautiful little nest upon the under surface of some coniferous tree at very varying distances from the ground; the nest itself—an exquisite structure, chiefly of the softest moss and lined with the most delicate of feathers—being sometimes finished as early as the middle of March, while fresh eggs may be taken in the middle of July; considerable latitude thus existing in the breeding-season. The brooding female is never long away from the nest, and, even if disturbed, only flits anxiously about the tree which contains her treasure, uttering a low, troubled cry so long as she is conscious of being under observation. If surveillance be removed, the little bird slips hastily on to her eggs, and probably remains in the nest, trusting to the decorative skill with which she has adorned its exterior to render her detection difficult. The eggs are white, suffused with reddish buff. Montagu found that the female goldcrest would even venture into a room in order to feed her captive young, and this not once in a way but all through the day. When a brood of young goldcrests is going to roost, a scramble takes place among the young for the warmest place; all roosting in a row, and each endeavouring to get an inside position. Although many of the goldcrests haunting the English hedge-rows in winter have been bred in the country, the largest proportion congregating in the coverts at that season are birds which have crossed the North Sea; thousands annually arriving upon the east coast of England, often much exhausted by their travels. The adult male has the forehead olive-green, the crest being bright yellow or orange, banded by a black stripe on either side; while the upper-parts are olive-green tinged with yellow, the wings dark brown edged with greenish yellow, and the lower-parts greyish olive. The female has the crest pale yellow instead of orange, while all her tints are more obscure than those of her partner.

Firecrest. Although a much more local bird than the goldcrest, the firecrest (*R. ignicapillus*) is fairly common in the pine-forests of a good many parts of Europe, often frequenting bushes and scrub as well as the larger branches of trees. Pairing by the middle of April, its whereabouts is generally intimated by its shrill call-note, which is louder and less tremulous than that of the goldcrest. The firecrest builds a similar nest to that of the goldcrest, but the eggs are of a warmer coloration. It is a partial migrant, crossing the North Sea in autumn, but only in very small numbers. Mr. Seebohm writes that these birds "twist



YELLOW-BROWED WARBLER, FIRECREST, AND GOLDCREST ($\frac{1}{2}$ nat. size).

in and out among the slender twigs, sometimes with head down and sometimes with feet up; but by far the most curious part of the performance is when they come to the end of the twig and examine the under surface of the leaves at its extremity. They have nothing to stand upon: so they flutter more like bees than birds from leaf to leaf, their little wings beating as hard as they can go. The male has the forehead buff, the crest bright orange, bordered with black on either side; two other black stripes pass through the eye and from the base of the bill downwards: the upper-parts are olive-green varied with gold on the sides of the neck, and the under-parts dull buffish white.

Rubycrest. The rubycrest (*R. calendula*) is a well-known bird in the United States, returning from the far north, in which it breeds, in

September, when it presses gradually south into all the Southern States, a few continuing their journey into South America. Dr. Coues gives the following description of its habits:—"To observe the manners of the ruby-crown one need only repair at the right season to the nearest thicket coppice or piece of shrubbery. These are its favourite resorts, especially in the fall and winter; though sometimes, more particularly in the spring, it appears to be more ambitious, and its slight form may be almost lost among the branches of the taller trees. We shall most likely find it not alone but in straggling troops, which keep up a sort of companionship with each other as well as with different birds, though each individual seems to be absorbed in its particular business. We hear the slender wiry note, and see the little creatures skipping nimbly about the smaller branches in endlessly varied attitudes, peering in the crevices of the bark for their minute insect-food, taking short nervous flights from one bough to another, twitching their wings as they alight, and always too busy to pay attention to what may be going on around them." The ruby-crest builds a tiny nest consisting of a mass of hair and feathers mixed with moss and some short bits of straw; commonly breeding in the heavy pine and spruce forests on the mountains of Colorado and also in Arizona. It was of the ruby-crest that Audubon himself wrote: "When I tell you that its song is fully as sonorous as that of the canary-bird, and much richer, I do not come up to the truth: for it is not only as powerful and clear, but much more varied and pleasing." The male has a rich scarlet crest: the upper-parts are greenish olive, and the wings and tail dusky: the under-parts being yellowish-white.

THE WOOD-WARBLERS.

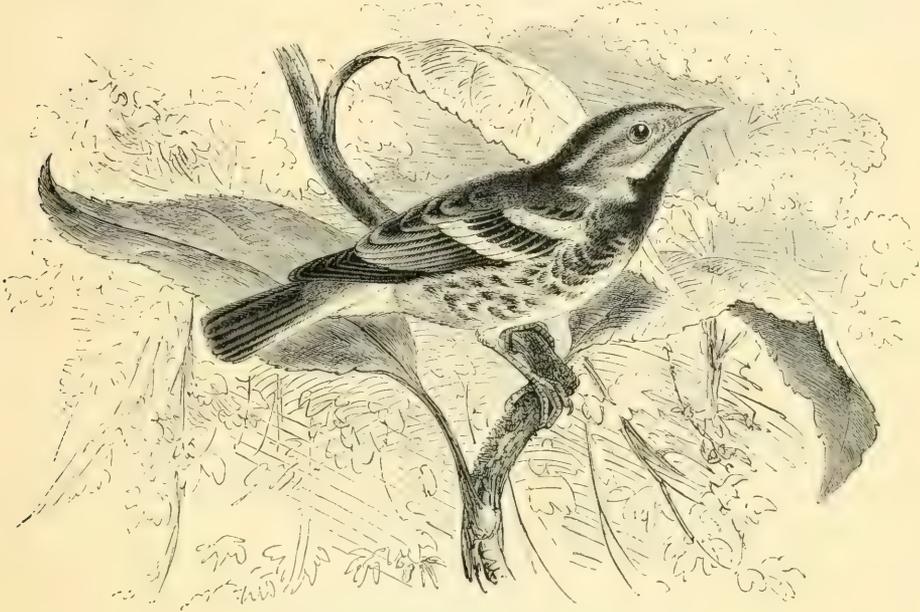
Family *MNIOTILTIDÆ*.

The American family of birds known as wood-warblers may be conveniently mentioned here, not only on account of their popular name, which causes them to be associated with the warblers of the Old World, but also from the circumstance that they are probably more or less closely related to the *Certhiidae*, among which they are placed by Brehm. It would be useless to attempt to define the whole family, or to mention the numerous genera; and we consequently select for illustration the black-throated green warbler (*Dendroica virens*) as a well-known example of a large and widely-spread genus. Small in build, the numerous species of this large group have the beak of variable size, conical in shape, and provided with rictal bristles; while the wings are long and pointed, the first and second primaries being the longest. The metatarsus is long, and the claws are rather small and much curved. The coloration of the tail-feathers is a good clue to any member of this genus, since these are almost invariably blotched with white. Of thirty-five reputed species of this genus of wood-warblers, twenty-six have been ascribed to North America, one of the best known of these being the summer yellow-bird of the United States, an abundant and familiar denizen of parks and orchards; while another is the lovely orange-breasted Blackburn's warbler, of which Dr. Coues says, "there is nothing to compare with the exquisite hue of this Promethean torch." The black-



DIPPER, PIED WAGTAIL AND YELLOW WAGTAIL.

throated green warbler which annually arrives in the Eastern parts of the United States early in May, nesting chiefly in fir-woods, and building in the oblique fork of a bough, generally at some distance from the ground, constructing its nest of a variety of materials, such as vegetable fibres and dry stems, lined with finer grass, horsehair, and feathers. The eggs are white in ground-colour, variegated with purplish spots. The song of the male is plaintive and prolonged, and generally to be heard among the pine-trees. As a straggler, this bird has occurred upon the



BLACK-THROATED GREEN WARBLER ($\frac{2}{3}$ nat. size).

island of Heligoland. The adult male has the upper-parts olive-green, yellow on the rump, the forehead and sides of the head bright yellow, the chin, breast, and throat jet black, the abdomen white, and the wings and tail dusky, the wings being barred with whitish.

THE DIPPERS.

Family *CINCLIDÆ*.

The dippers form a small group apparently allied to the thrushes, but specially adapted to a semi-aquatic life. They possess a narrow, straight bill, slightly bent and notched; a very short and rounded wing; and a short and broad tail; the metatarsus being long and smooth; while the feet are furnished with long claws. The sexes are alike; and the young, unlike the adults, are always spotted on the lower surface. The plumage is close and dense, and the body is covered with down. The dippers frequent the beds of clear streams in the northern parts of both hemispheres; while three species exist in South America, one of the latter being Schulz's dipper—a dark, grey bird with a pretty rufous throat, but

similar in size and shape to the European species. The whole of the twelve known species are included in the genus *Cinclus*. The mountain-streams of Europe are all frequented by one or other form of the white-breasted dippers, which agree in habits wherever they are found. The busy, bustling dipper is occasionally to be seen sporting upon the seashore at the mouth of some fresh-water burn; but we connect it more naturally with the eddying rapids of the salmon river, or the rippling waters of the fellside beck. The common dipper (*Cinclus aquaticus*) of Western Europe is a very early breeder, building at the end of winter, sometimes in the branches or the roots of a tree, but generally beneath a bridge, or overhanging rock. The nest is constructed of fine stems of grass, lined with dead leaves, and enclosed in a beautifully formed case of green moss; the eggs being pure white. Although the dipper delights in frosty weather, its song may be heard at any season of the year. Whether the loosened ice be floating down the river, or the flowering of the pilewort in the hedgeroad afford an omen that the present is the time to pair, the dipper is ever a perfect embodiment of grace combined with indomitable energy. Retaining a spirit unsoured and unchafed by the petty disappointments of life, nothing ever seems to come amiss to him. When the redwing hops dolefully across the snowdrift, and famishing rooks fall with beak and nail upon weaker birds, the dipper preserves his equanimity intact, and manages to secure an easy competency. The adult has the upper-parts slaty grey; the head brown; the chin, throat, and upper breast pure white; and the rest of the lower-parts chestnut-brown, varying much in intensity. The European species is replaced in the Himalaya by the brown dipper (*C. asiaticus*), which is found at elevations from one to fourteen thousand feet, according to the season. This dipper lays at very different periods, according to elevation, sometimes nesting as early as December: the nests found by Mr. Hume were large balls of moss, wedged into clefts of moss and fern-covered rocks, the one, half under a little cascade, the other about a foot above the water's edge in the side of a rock standing in the midst of a broad, deep stream. The eggs are pure white, similar to those of the European dipper, but smaller. The adult male has the entire plumage chocolate-brown, with the edges of the feathers somewhat paler in places, the eyelids are covered with white feathers, and the wings and tail are dark brown.

THE WRENS.

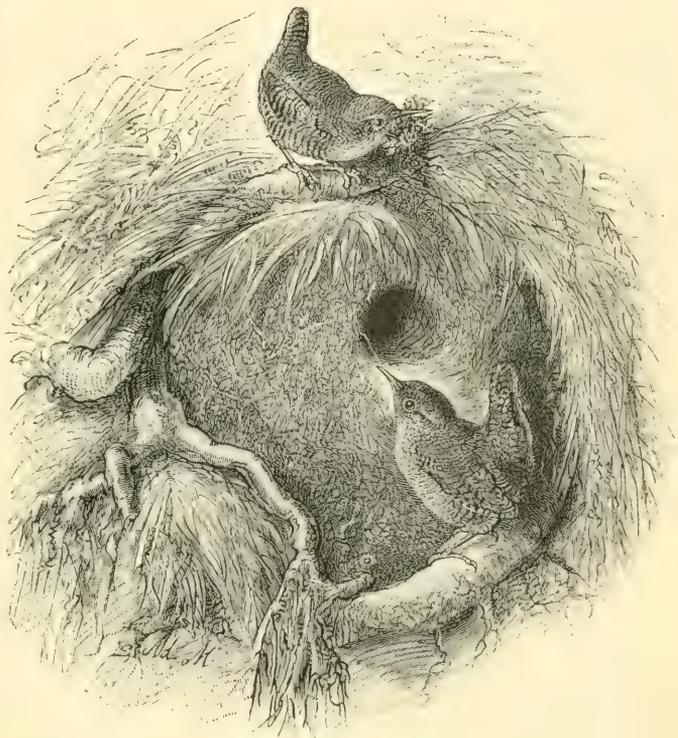
Family TROGLODYTIDÆ.

The wrens are a group of very small birds, showing a considerable variety of form among upwards of a hundred representatives. They are characterised by a moderate or slender bill, either straight or slightly curved; the nostrils being narrow, or broadly oval, and exposed; while the wings are short and generally rounded; and the tail of variable length, often rounded, and frequently carried over the back. These birds are most abundantly represented in South America, but have their typical representatives both in North America and the northern parts of the Old World. Certain forms are also found in the Himalaya and Tibet,

while others occur in Patagonia and North-West America. Among a large number of generic types (nineteen), space admits of our noticing but two.

True Wrens. The common wren and its congeners have the beak of moderate size, pointed and slightly curved; the wing being very short and rounded, and the tail also comparatively short and rounded. The feet are strong for so small a bird, and the metatarsus is comparatively long. Typically a European bird, the common wren (*Troglodytes vulgaris*) is represented in the Kurile Islands by a race remarkable for its long bill; while the Japanese wren is darker and more rufous on the under-parts than the British one. Mr. Seebohm considers, however, that in the colour of the upper-parts the various forms of wrens completely intergrade, so that it is impossible to draw a line anywhere between the palest desert forms from Algeria and Turkestan and the darkest tropical forms from Kashmir and Sikhim. A pale form of wren inhabits even the desolate Behring Island.

The common wren is one of the most familiar of European birds, its sweet ringing song being heard at almost every season of the year, not excepting frosty weather. The wren builds a pretty domed nest, varying in material with the situation: one of the most unattractive that we have seen being built of strong wheat straws with a little hay added to the dome. Other nests have been made of green moss studded with lichen on the outside, but whatever the material employed the nest is always domed. The eggs are white, finely spotted with red. Mr. Dresser remarks that "the wren has a peculiar habit of building nests which are not required for the purposes of incubation. Although it does not appear that anyone has been able satisfactorily to show for what purpose they are constructed, my own opinion is that they are intended as houses of refuge during cold or inclement weather; and this has been shared by many other naturalists. The wren appears to be susceptible of cold: and, during the winter, an entire family will creep into a convenient hole, and by huddling close together retain as much heat as possible." We have captured wrens in their roost in



WRENS AND THEIR NEST.

winter, but failed to keep them alive, although they are often exposed for sale in the Paris bird-market. The wren generally rears several broods in a season, and the old birds attend their offspring with the utmost assiduity.

The European wren is not, it must be confessed, much of a musician, but some of the South American representatives of the family are renowned for their powers of song. Among them stands pre-eminent the so-called organ bird, or warbling wren (*Cyphorhinus cantans*) of the forests of Amazonia. "When its singular notes strike the ear for the first time," writes Bates, "the impression cannot be resisted that they are produced by a human voice; some musical boy must be gathering fruits in the thicket, and singing a few notes to cheer himself. The tones become more fluty and plaintive; they are now those of a flageolet, and, notwithstanding the utter impossibility of the thing, one is for a moment convinced that someone is playing that instrument. . . . It is the only songster that makes an impression on the natives, who sometimes rest their paddles whilst travelling in their small canoes along the shady bypaths, as if struck by the mysterious sound."

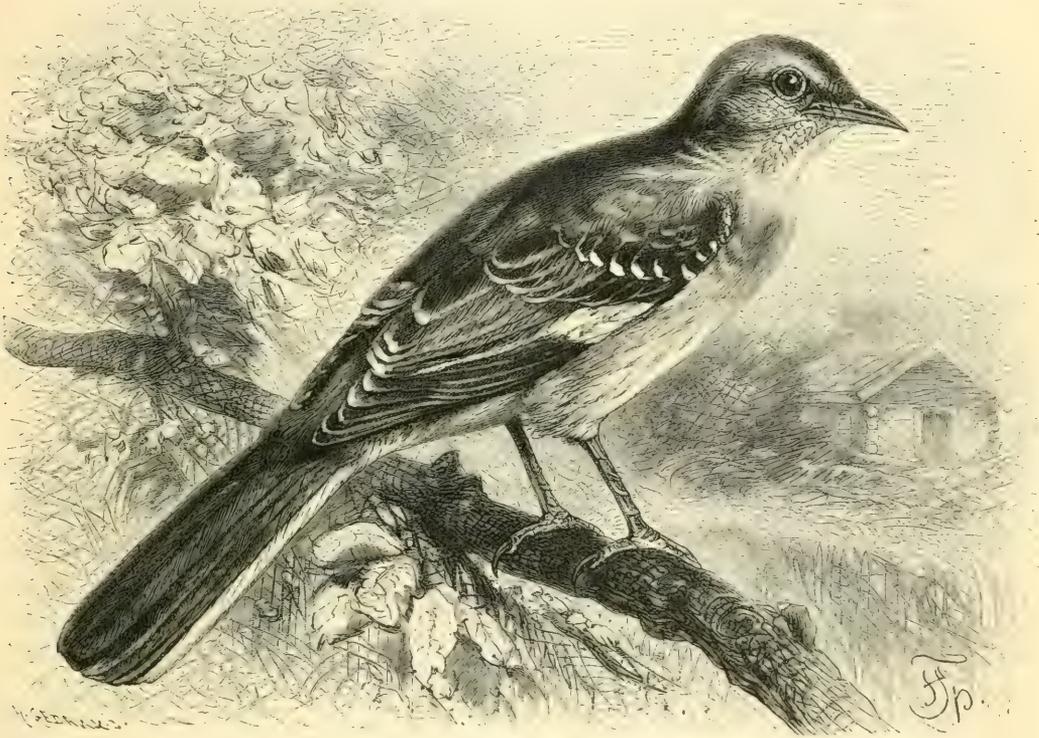
The adult cock-bird of the common wren has the upper-parts reddish brown, banded, except the head, with numerous blackish brown bars; the eyebrows being dull white, as are also the under-parts, although varied with rufous. In Iceland and the Faroes this wren is replaced by the northern wren (*T. borealis*), which is larger, darker, and has the under-parts more strongly barred.

Cactus-Wrens. Some twenty species are included in this group, all of which possess a stout compressed bill. The wings are broad, the tail graduated and fan-shaped, and the claws of the feet strong and much curved. Chiefly inhabitants of Central and South America, the true cactus-wren (*Campylorhynchus brunneicapillus*) is found in California and Texas. Of the habits of this wren, Dr. Coues gives the following description, observing that in "the most arid and desolate regions of the South-West, where the cacti flourish with wonderful luxuriance, covering the impoverished tracts of volcanic débris with a kind of vegetation only less ugly and forbidding than the very scoria, this wren makes its home and places its nests on every hand in the thorny embrace of the repulsive vegetation. True to the instincts and traditions of the wren family, it builds a bulky and conspicuous domicile; and when many are breeding together the structures become as noticeable as the nests which a colony of marsh-wrens build in the heart of the swaying reeds. But it is not a globular mass of material, nor yet a cup; it is like a purse or pouch and also peculiar in its position, for such nests are usually pensive. In the present case, the nest resembles a flattened flask—more exactly, it is like the nursing-bottle with which all mothers are familiar, and this is laid horizontally on its flat side in the crotch of a cactus. It is constructed of grasses and small twigs woven or matted together, and lined with feathers. Including the covered way or neck of the bottle, leading to the nest proper, the structure is some ten or twelve inches long and rather more than half as much in breadth. The bird appears to be an early breeder. Dr. Cooper found it preparing to build nests about San Diego so early as the 26th February. The eggs are white, but so thickly flecked with small salmon-coloured spots, that a rich cast of this tint is given to the whole surface."

THE MOCKING-BIRDS AND THEIR ALLIES.

Family *MIMIDÆ*.

Space admits of only the very briefest reference to the American family typified by the well-known mocking-bird (*Mimus polyglottus*); this family being generally placed between the wrens and the babblers, to the latter of which it is nearly allied. The babblers are but poor songsters, but the mocking-birds are renowned for their vocal powers. Twelve genera are included in the family, but it would be useless to attempt to point out their distinctive characters.



MOCKING-BIRD.

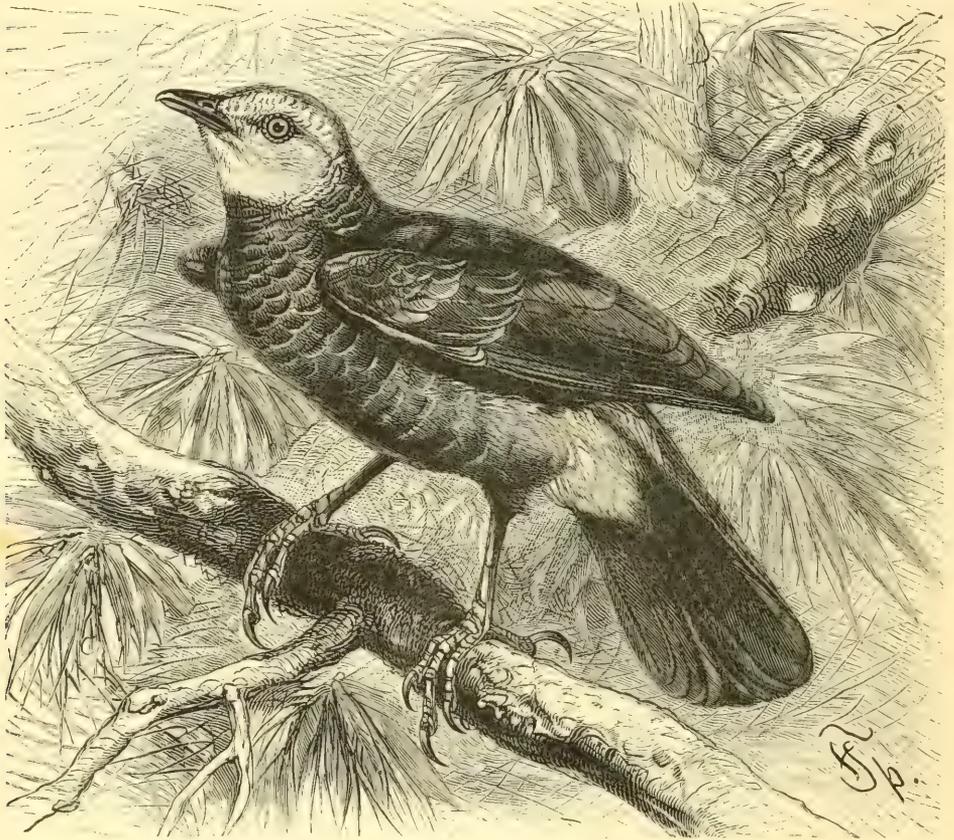
THE BABBLERS.

Family *CRATEROPODIDÆ*.

This family contains a very large number of birds, the affinities of some of which are doubtful, though the majority agree in possessing a short and rounded wing, together with large and powerful legs and feet. The bill is variously modified, but always adapted to an insectivorous diet, and is furnished with rictal bristles. The babblers belong principally to the Oriental region, though their distribution through the tropical parts of the world is very extensive. The laughing-thrushes (*Trochalopteron*) of the Himalaya and Southern China are well-known representatives of this group, as are the true babblers (*Argya*), which

wander in flocks all over the plains of India and Burma. The scimitar-babblers form another important section of the same family, highly characteristic of tropical Asia, and distinguished by their long curved bills; but we are compelled to restrict our observations to one or two only of the genera.

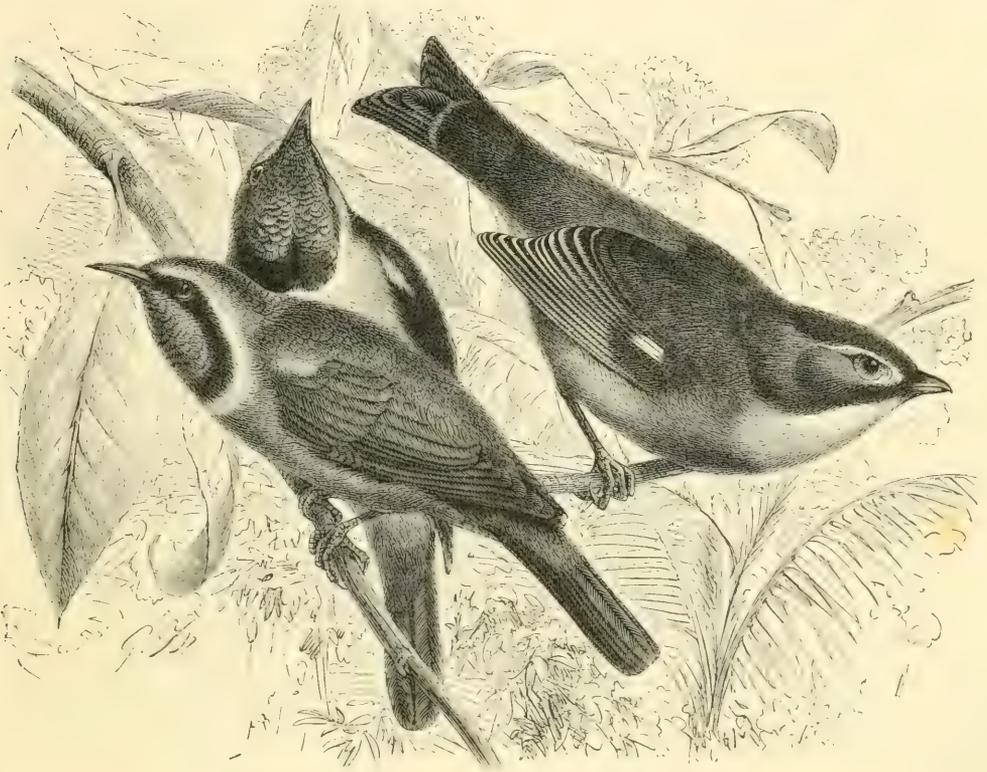
Typical Babblers. The birds of this group have a fairly stout bill, with the upper mandible distinctly arched, while the wing is short and rounded; and the metatarsus, toes, and claws are remarkably strong. The style of coloration is generally plain and entirely devoid of gorgeous tints. Several species of the true



ABYSSINIAN BABBLER ($\frac{1}{3}$ nat. size).

babblers are found in the African continent, while others are peculiar to the Indian region. Among these the species (*Crateropus leucopygius*), here illustrated, inhabits the forests of Abyssinia, frequenting dense scrub on the slopes of the mountains. A social species, and rarely found without companions of its own kind, it principally lives in flocks of ten or a dozen individuals, which seek their food in company. The flight is laboured, the bird is generally rising but little above the ground, in passing from one bush to another. It is a lively noisy species like all its congeners, and readily announces its whereabouts by its busy chattering. The adult is dark umber-brown above; the sides of the head and chin and tail-coverts are white; the lower-parts are dark umber-brown edged

Green Bulbuls. Assigned by many ornithologists to a distinct family,—*Pyenonotida*,—the true bulbuls, together with the green bulbuls (*Chloropsis*), are regarded by Mr. Oates as not entitled to be separated from the babblers; the green bulbuls belonging to one subfamily of this great assemblage, and the true bulbuls to another. The subfamily (*Liotrichine*) containing the green bulbuls presents the following characters:—The sexes are unlike, the birds being either solitary or associating only in small parties; while their habits are entirely arboreal, their plumage brilliant, and their eggs generally spotted. The green

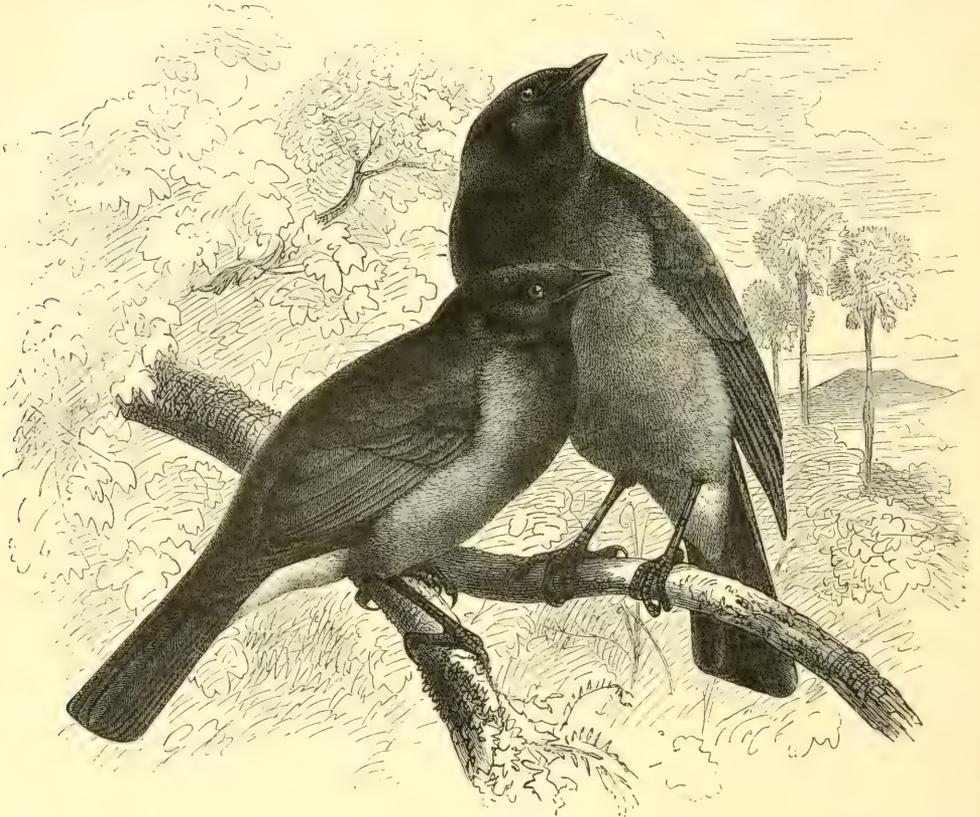


GOLD-FRONTED GREEN BULBUL AND RED-BILLED LIOTHRIX.

bulbuls are characterised by the possession of a slender curved bill equalling the head in length, the tip being notched, and the nostrils oval; the wing is rounded, the tail is short and square, and the feet are short and weak. The birds of this group are only found in Southern and South-Eastern Asia, seven species occurring within the Indian Empire. One of the best known is the gold-fronted green bulbul (*Chloropsis aurifrons*), which forms an excellent cage-bird. Feeding upon the insects which it picks off the surfaces of leaves, this bird is exceedingly difficult to detect amid a profusion of foliage, since its bright grass-green plumage harmonises closely with the green leaves: it lives in pairs or singly. Its range extends over a considerable portion of Bengal and the adjacent States, as well as British Burma and an outlying portion of the spurs of the Himalaya. Jerdon states that it has a sweet song, and is also an excellent

mimic of the notes of other birds. Mr. Oates gives the following description of the male:—"The forehead and front of the crown orange-yellow, ear-coverts and lower-throat black, chin and upper-throat purplish blue; a yellow collar passes round the black of the throat; the remainder of the plumage is bright green."

True Bulbuls. The true bulbuls, of which there are several genera, among which *Pycnonotus* may be regarded as typical, form a subfamily (*Brachypodinae*), differing from the preceding by the following characters:—The sexes are alike. The metatarsus is very short, and never exceeds the length of the



PALESTINE AND WHITE-NECKED BULBULS ($\frac{1}{2}$ nat. size).

middle toe and its claw; while the wing is rounded and moderately long, and the nape generally furnished with some hairs. As regards their general habits, and the coloration of their eggs, the true bulbuls resemble the green bulbuls. While many of the bulbuls have a more or less largely developed crest, those of the genus under consideration are practically crestless. They are further characterised by having a bill of moderate size with the culmen curved and the sides compressed to the tip; the gape being furnished with a few short, weak bristles, while the nostrils are basal and placed in a groove, the wings are moderate and rounded, the tail is fairly long and rounded, and the feet are furnished with strong claws. Well represented in Africa, this genus is also found in India. Among the species, the Palestine bulbul (*Pycnonotus nigricans*) is very common in Syria, Arabia, Cyprus, and

Rhodes, also visiting the Cyclades; while the white-vented bulbul (*P. arsinöë*) frequents the mimosa groves of Northern Africa. It is considered the finest songster of all the family. Mr. Gurney, who met with this species at Faioum, was told by the natives that it was very partial to apricots, and found it singing among tall palm-trees. In South Africa the red-eyebrowed bulbul (*P. capensis*), the *knif-kop* of the colonists, is well known for its partiality to figs and grapes; and is a bird of sociable temperament, generally living in small flocks.

Liothrix. The red-billed liothrix of India (*Liothrix lutea*), shown on the right side of the figure on p. 513 is the typical representative of another subfamily, including such members of the present family as are arboreal in their habits, and of which the sexes are differently coloured; the first character distinguishing them from the *Brachypodinae*, and the second from all the rest. In the typical genus, which includes but a single mountain species, the feathers of the slightly-forked tail are curved outwards.

THE FLYCATCHERS.

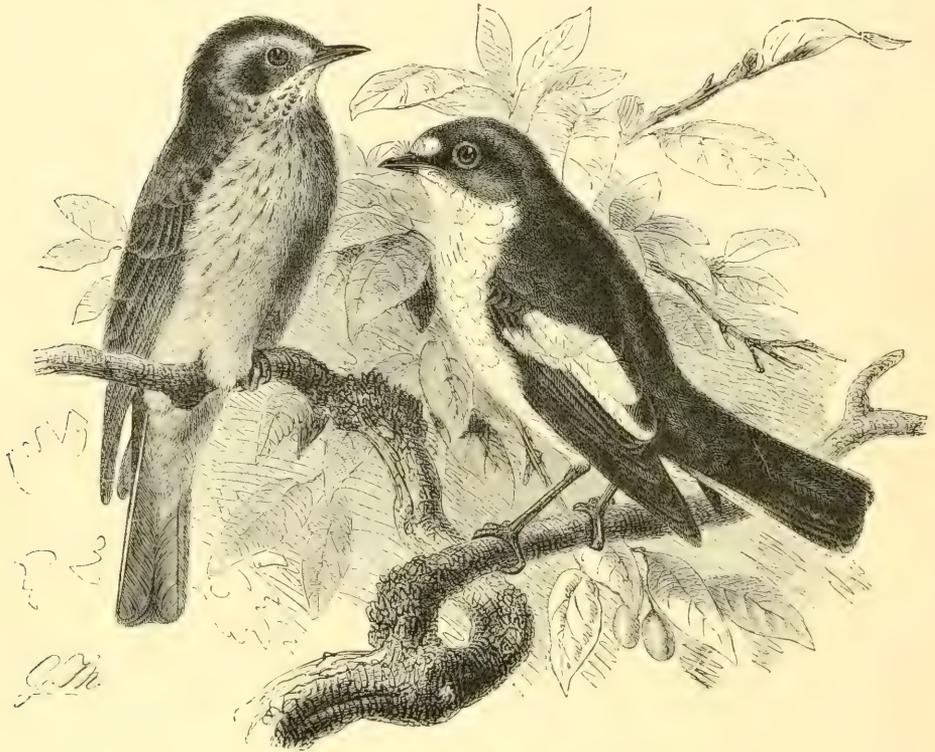
Family *MUSCICAPIDÆ*.

The large group of birds now claiming our attention are insectivorous in their habits, and, like the chats, pursue their prey in short flights from a perch, to which they return after the capture. Exhibiting much variety of form and plumage, some species are for the most part plain and homely-coloured birds, while others, such as the Indian paradise-flycatchers (*Terpsiphone*), almost vie with the birds from which they take the first half of their name in the bright coloration of their plumage and the elongation of the central tail-feathers of the male. As a group, Mr. Oates considers that the flycatchers may be best recognised by the mottled plumage of the nestling, and the presence of numerous hairs (distinct from the rictal bristles) stretching from the forehead over the nostrils. There are, however, many connecting links between the most specialised flycatchers with their flattened beaks, and the more warbler-like forms. With smooth, simply notched beak, ten primaries, and twelve tail-feathers, they all have feebly developed legs and feet, which prevent them from walking on the ground, and thus serve to differentiate them from the more typical members of the thrush family. Most abundant in the tropical regions of the Old World, the flycatchers are quite unknown in America.

True Flycatchers. The typical flycatchers (*Muscicapa*), of which there are a considerable number of species, with a wide distribution in the Old World, have the tail considerably shorter than the wing, the second primary equal in length to the fifth, and the wings when closed not reaching beyond the middle of the tail.

Spotted Flycatcher. Among the commonest of European summer birds is the spotted or grey flycatcher (*Muscicapa griseola*), which does not, however, reach its haunts until later in the spring than the majority of small migrants, not being met with even in Spain until the latter part of April, and being still later in the more northern parts of its habitat. Unlike most English migratory songsters, this flycatcher may be met with throughout the summer in the London

parks, although its sombre plumage, and its habit of perching high up on trees, render it far from conspicuous. Variouslly placed, the nest of this species may be situated on an ivy-clad wall, in the middle of a shrub, or upon wooded rocks overhanging rivers, while it has been found in the hole of a tree, in a flower-basket hanging at a window, and even in an empty cup. The nest is made of moss, grass, and horsehair, and the eggs are white, much blotched and suffused with light red. Although not disdaining larger insects, the parent birds feed their offspring chiefly on flies, caught in the well-known manner characteristic of the group. In the adult cock the plumage of the upper-parts is uniform brown, with dark central



SPOTTED AND PIED FLYCATCHERS ($\frac{2}{3}$ nat. size).

lines to the feathers of the crown of the head; the wings and tail are likewise brown; while the sides of the head and under-parts are dull white, the breast being streaked with grey.

Pied Flycatcher.

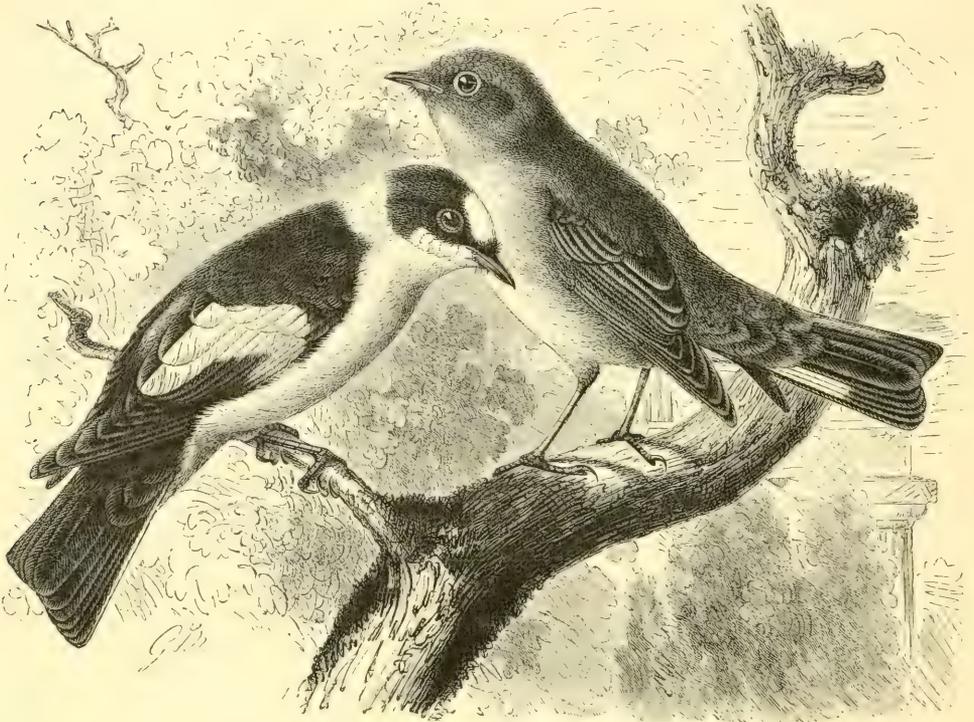
Spending the summer in central and northern Europe, and passing on migration through the Spanish peninsula in April, the pied flycatcher (*M. atricapilla*) associates its presence with scenes of picturesque beauty in many lands. The male possesses a sweet song, which commences like that of the great tit, and then passes into a sweet strain suggestive of that of the common redstart. The constancy with which a pair of pied flycatchers will often return to the same nesting-hole, during a period of several successive years, is one of the most remarkable traits in its character. The nest is sometimes built in a

chink of a stone wall or ruined building; the stump of a felled tree often supplies a convenient hole; while sometimes we may find a nest in a birch-tree at from four to seven feet from the ground. Another couple will be found to have seized a fissure in one of the dead limbs of a tall Scotch fir; and yet another nest may be in the hollow branch of an ash-tree, while a decayed thorn-bush sometimes holds the nest for several seasons. The nest is only slightly put together, composed almost entirely of small fibrous roots and dried grass, always lined with a little hair, and generally a few decayed leaves on the outside. The eggs, which vary in number from five to six or even seven, are of a pale green, and so closely resemble those of the redstart that it is frequently difficult to distinguish them unless they are contrasted together. The males soon after their arrival will frequently perch for a considerable time upon a branch of some decayed tree, constantly repeating their lively song between their sallies in pursuit of passing insects, but the females are somewhat coy, and rather shun the other sex. Pied flycatchers are birds of strong passion, and do not hesitate to fight for the love of their female companions, but paired couples are devotedly attached to one another. So long as the hen is sitting upon her eggs, her mate caters to supply her appetite with constant activity; and when the young are hatched the old birds are devoted to them, the female feeding them at more frequent intervals than her companion. While the call-note of the male somewhat resembles the sound produced by clattering together two pebbles, the female has a cry like that of a hen chaffinch. Individuals breeding in districts where woodpeckers are plentiful frequently adopt the deserted holes of the latter birds for their own nests. The pied flycatcher rarely spends more than three months upon its breeding-grounds, and, long before the trees have begun to change from green to red and orange, the pied flycatchers in England slip quietly away almost unnoticed, to seek an asylum on the southern side of the Mediterranean. In Switzerland, however, and other parts of Central Europe they seem more loth to bid farewell to the scene of their summer life; and in the former country they are often to be seen poised upon the lower branches of the walnut trees. In the summer they obtain much of their prey upon the ground, and after capturing a victim usually alight upon a fresh perch. In confinement the pied flycatcher is shy and retiring, but contrives to dart upon any insects that may be introduced into its cage with surprising velocity. The plumage of the male in the breeding-season is black above, with here and there a shade of brown; although we have never seen a specimen in which the black plumage was entirely unsullied by a brown tinge. The wings are dark brown, with the primaries white at the base of the outer web; the tail is black-and-white; the forehead is white, as are the cheeks and under-surface.

White-Collared Flycatcher. The white-collared flycatcher (*M. collaris*) visits the south of Europe in considerable numbers, but is always a local bird. Like its congener the pied flycatcher, it frequents the neighbourhood of old timber, and builds its nest in hollow trees; the eggs being greenish blue. The song is distinct from that of the pied flycatcher, as is also the call-note, the latter being a sharp disagreeable whistle. It is possible, however, that the two species interbreed, since the form found in the Caucasus is intermediate between the white-collared and the pied flycatcher. The adult male is black above, the lower back and rump

being ashy grey; the wing-feathers black with white bases, the tail black-edged with white on the outer webs; the forehead white, and a white collar completely encircling the hind-neck; the throat and lower-parts are pure white.

Red-Breasted Flycatcher. The red-breasted flycatcher (*M. parva*) is a summer visitant to Eastern Europe, occasionally wandering into the western part of the Continent. Always a rare local bird, though frequently overlooked, and occasionally straggling to the shores of the British Isles on autumnal migration, it breeds in beech-forests, constructing its nest in some natural cavity, or between a bunch of small twigs and the main stem. The nest is built almost entirely



WHITE COLLARED AND RED-BREASTED FLY-CATCHER ($\frac{2}{3}$ nat. size).

of moss, with a little lichen and hairs; and the eggs are pale bluish green in ground-colour, freckled with reddish and greyish brown. The song is simple and unpretentious, but the actions of the bird are full of life and energy. The adult male has the upper-parts ashy brown; the two central tail-feathers being dark brown, and the remainder for the greater part white; while the cheeks, throat, and fore-neck are clear orange, and the rest of the under surface white.

Paradise-Flycatchers. Commonplace and devoid of anything striking in their plumage, the typical flycatchers agree with a large assemblage of genera in having the tail considerably shorter than the wing. Leaving these, we pass on to consider briefly a much more beautiful but smaller group of genera, in which the tail equals or exceeds the wing in length. From their allies, the paradise-flycatchers (*Terpsiphone*) are distinguished by the crested head, and the great length of the middle pair of tail-feathers. The bill is very large, much depressed,

and swollen, with numerous long and coarse bristles at the rictus. Distributed all over India and the adjacent regions, the paradise-flycatchers have the sexes almost or completely alike for the first two years, when the prevailing coloration of the plumage is chestnut. This dress is never changed by the hen birds; but sometimes after the second autumn the cocks assume a beautiful white plumage, and it thus happens that in some cases both members of a pair may be breeding in the chestnut dress, instead of the male being far more gorgeous than his partner. Writing of the Indian paradise-flycatcher (*T. paradisi*), whose range extends from Ceylon to Kashmir, Leith Adams observes, that in the plains of India "its singularly attractive plumage can scarcely escape observation. The adult male has a blue head and white body, with two of the tail-feathers prolonged for upwards of eight inches beyond the tip; those in the female scarcely extending beyond a quarter of an inch. The young birds are chestnut. The paradise-flycatcher does not possess great power of flight, except when hunting for insects: then its movements are quick, it suddenly appears on a branch beside you, and the next moment is seen shooting like an arrow through the grove, at times uttering a harsh chirp—now perched on the upper bough of a tamarind, now on the lower one of a neighbouring tree—spectre-like it suddenly appears, and is as quickly gone." The five eggs laid by the hen are pink spotted with brownish red.

Fantail-Flycatchers. Our notice of the family may be brought to an end by a brief mention of the fantail-flycatchers (*Rhipidura*), which, while differing from the members of the preceding genus by the absence of a crest on the head are distinguished from the other crestless forms of the group by the length of the tail considerably exceeding that of the wing. Possessing a short depressed bill, broad at the base, with the culmen arched, and the upper mandible notched, these birds have the nostrils oval, basal, and nearly covered by the rictal bristles: while the tail is ample and rounded, and the feet are moderate and slender. Full of life and energy, hopping merrily from bough to bough, the fantails construct beautiful little nests covered with cobwebs.

Between forty and fifty species of fantails are known, inhabiting the Oriental and Australian regions, and ranging to Tasmania and the islands of the Malay Archipelago. Thus Layard's fantail inhabits the Fiji group of islands, while the white-bellied fantail is found in the islands of the Philippine Archipelago, and the sooty fantail is peculiar to New Zealand. The white-browed fantail ranges from Ceylon to the Himalaya; while the Javan fantail inhabits Tenasserim, Siam, Cochin China, and the Malay Peninsula. One of the best known of the Indian fantails is the white-browed species (*R. albifrontata*), which breeds all over the plains of India, sometimes nesting in a bush but generally in a mango tree. The nest is cup-shaped and deep, framed of fine stems of grass, and lined with fine grass roots and a little hair; the exterior being coated with cobwebs. It is generally placed upon the upper surface of a nearly horizontal bough: and the eggs are white in ground-colour, with many minute brown specks, and a fine zone of greyish brown at the larger end. This fantail rears two broods in a season. The adult male has the crown, lores, and ear-coverts black, the forehead white; the wings and upper-parts ash-brown, the cheeks and throat black, tipped with white; the sides of the breast black; and the remainder of the lower-parts white.

In the wooded tracts of the lower Himalayan ranges, the white-throated fantail (*R. albicollis*) is to be seen in the summer months, generally frequenting a thickly wooded country; being very partial to mango trees, darting out occasionally with a tumbling flight as if falling from the tree and suddenly returning to its perch. Keeping up an almost incessant snapping sound with the beak as it hawks about the tree for insects, and indulging occasionally in a not unpleasing little song, it nests in some slender upright fork; the nest being composed of dry grass-stems and pieces of dry blades of grass, with here and there fragments of vegetable fibre, and entirely coated with cobwebs; while in form it resembles an inverted cone and is comparatively solid. The eggs of this species are slightly smaller than those of the last; and are wanting in gloss, and of a very pale fawn, or greyish white ground colour, with an irregular zone of grey specks and spots. The adult male is of a general smoky black above with a white eye-stripe; the wings are browner than the back; the two central tail-feathers are black, the remainder being broadly tipped with white; a dull patch of white extends across the lower throat; and the rest of the under surface is slaty black.

One of the tamest and most familiar of Australian birds is the little black fantail (*R. motacilloides*). Gould says that it passes much of its time on the ground, over which it runs and darts with the utmost celerity, and when skirting the stream with tail erect and shaking from side to side it presents an appearance very similar to that of the pied wagtails; the movements of the tails of the two birds, however, are very different, that of the European being perpendicular, while that of the Australian is a kind of lateral swing. Its song, which consists of a few loud and shrill notes, is continually poured forth throughout the entire night, especially if it be moonlight; and the flight is at times gracefully undulating, but always of very short duration. It commences to build in September, often placing its beautiful cup-shaped nest upon some branch overhanging the water. Sometimes it nests upon the upper side of a fallen branch without the slightest shelter from the sun and rain, and at an elevation of only three or four feet from the ground. The nest consists of dried grasses, strips of bark and roots all firmly matted together and covered over with cobwebs, so that the entire nest looks like an excrescence of the wood; it is lined with fine grass, roots, or feathers. The eggs are dull greenish white, blotched and spotted with blackish and chestnut-brown. The old birds are very tame at the nest, and will even perch upon it while the eggs are being removed, uttering a peculiar cry. The adult male has the upper-parts black; the great wing-coverts are brown, as are the primaries; the tail is black, as are the sides of the face, throat, and sides of the breast: and the remainder of the lower surface is white.

THE SWALLOWS.

Family *HIRUNDINIDÆ*.

Possessing a short and wide bill, deeply cleft, with the gape very wide, and the mouth opening to about the line of the eye, the swallows have the wings

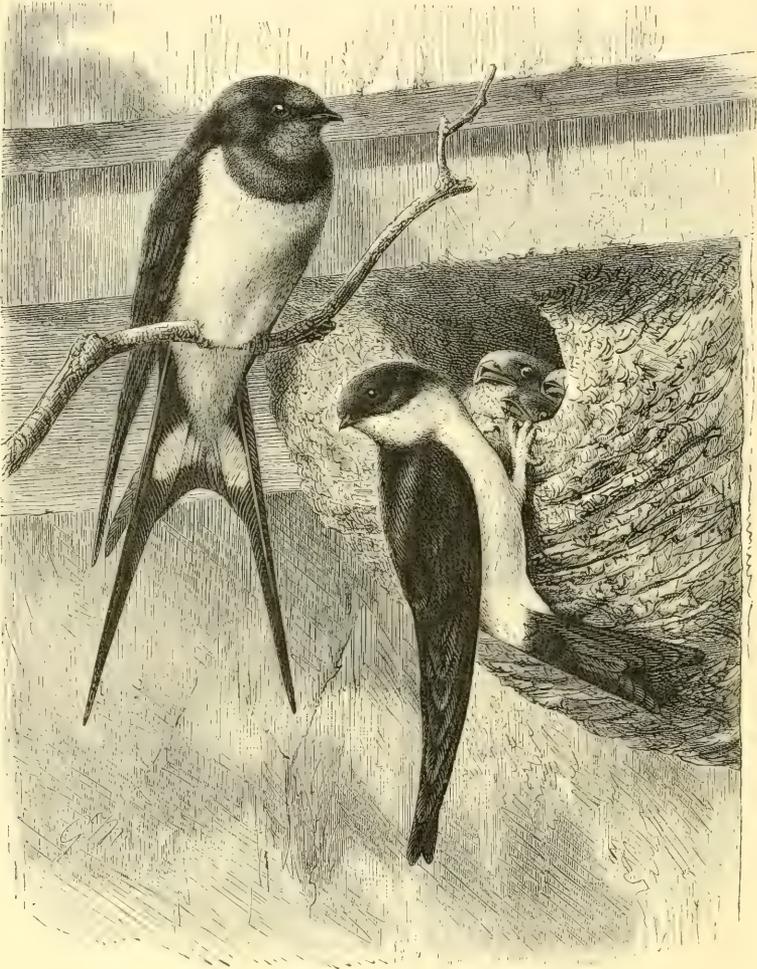
much elongated, and comparatively narrow, consisting of only nine primaries, of which the two outer ones are about equal in length, although the inner ones decrease, while the secondaries are very short. The feet are small and weak, and very imperfectly adapted for progression; while the tail consists of twelve feathers, and is generally forked. As a family, the swallows are cosmopolitan, some species entering the Arctic Circle; the common swallow having strayed to Spitzbergen and Novaia Zemlia.

True Swallows. The true swallows (*Hirundo*) have a short, depressed bill; their wings and tail are very long, and the outer tail-feathers of the adult enormously elongated. The plumage is of a purplish blue above, correlated with a more or less perfect zone on the breast. The swallows construct their nests of fine clay, carefully welded into a compact mass, and lined with feathers.

Africa is the home of many remarkable swallows, and it is in that continent that the members of the genus seem to reach their largest dimensions, the great African mosque swallow (*H. senegalensis*) measuring upwards of nine inches in length, and Monteiro's swallow (*H. monteiri*) being nearly as large. The elongation of the outer tail-feathers is most marked in the wire-tailed swallow (*H. smithi*), which have their shafts produced as much as seven inches, this species inhabiting India and some parts of Africa. Selater's swallow is a lovely green and white bird, lately discovered in San Domingo.

Chimney Swallow. The migrations of the chimney or house-swallow (*H. rustica*) and its allies, have long excited the interest of mankind; and we confess to sharing in the sentiment which welcomes the return of the swallows to their home in the rafters of the old barn or the cornice of their favourite porch. The 6th of April is the earliest date on which we have observed the swallow migrating through Great Britain, but some forward individuals generally contrive to report themselves at a lighthouse or other haven of safety a week or two before the arrival of the majority of their fellows. Even in the autumn months we have seen a good deal of the migration of the swallows, although the movements of the birds are less generally noticed at that season, because their departure is extended over so many weeks. A few springs ago we left the North of England, and it was only when we reached Abbeville, on the 14th of April, that we fell in with the first bird flying north alone. Early on the following morning at Bordeaux, we saw a flock of swallows evidently newly waking up from a night of slumber: and south of that town we continued to see occasional stragglers, but never met with the species in pairs except in one or two exceptional instances. On our return through France, swallows were to be counted by thousands migrating between Bayonne and Bordeaux; the actual passage of these and other migrating birds being much more prolonged even in the spring than is generally admitted. Whilst we were staying at the village of Burguete, small parties of swallows passed very frequently; we generally saw them flying over the hills to the right and left of the Ronceveaux Pass. There was no hesitation as to what they should do, at least with the great majority: although we witnessed one solitary straggler approach the cloud-capped hills only to swerve from its course and come flying back in a southerly direction, mani-

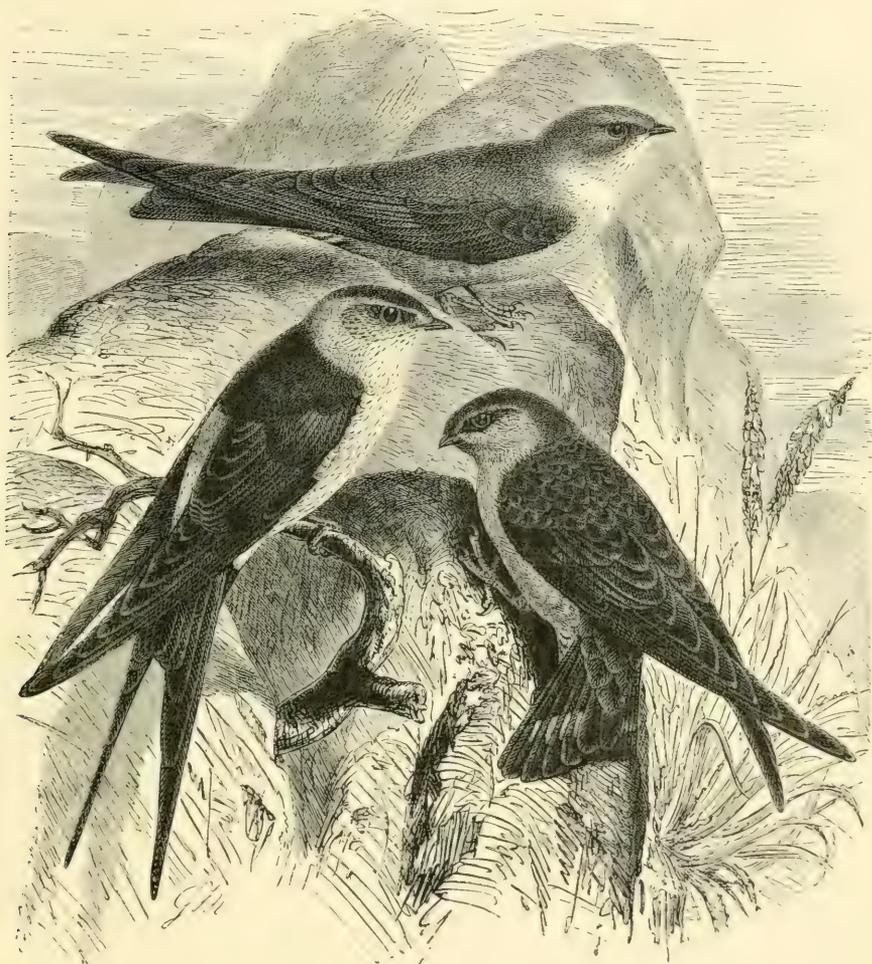
festly unwilling to cross the hills until the clouds had lifted. Unless interfered with, the swallows that come to England build their mud-nests in the same corners many successive years, the nest being generally placed in a situation which affords some support. Nests in trees are very rare; yet the bird does not always require a ledge or shelf for its nest, as in Germany we have seen a good many built in outhouses. The nest is lined with feathers and dry grass; and the first brood



CHIMNEY-SWALLOW AND HOUSE-MARTIN ($\frac{1}{2}$ nat. size).

will leave it as a rule during the last days of June, while the second broods are able to fly before August has expired. Some birds even rear late broods during October, but the struggle for existence among the young has then become very severe. The swallow lays from four to six eggs, white in ground-colour, and spotted with brown and grey. The male in summer has the forehead and throat chestnut, a band on the breast, and the upper-parts steel-blue, glossed with purple; while the tail-feathers are spotted with white, and the under-parts pink or white.

Red-Rumped Swallow. This pretty swallow (*H. rufula*) spends the summer in the eastern portion of the Mediterranean, whence it extends eastwards to the Himalaya and Turkestan. Many red-rumped swallows breed in Greece, inhabiting the mountain-ranges of that country. In Palestine this species nests in caves, although the birds do not consort in colonies; the arches of the monastery on Mount Carmel being a favourite breeding-place. The nest is a beautiful



RED-RUMPED SWALLOW AND CRAG MARTIN ($\frac{1}{2}$ nat. size).

structure built of the same materials as that of the house-martin: the eggs being four in number, and pure white in colour. This swallow is common in warm sheltered valleys in the highest parts of the vine-regions of Greece and Asia Minor, where it may often be seen hawking for insects in company with the swallow and house-martin. It cannot, however, be mistaken for either of these species, as it possesses the long forked tail of the swallows in addition to the white rump of the house-martin; and it may be distinguished by its note, which is lower than that of the swallow. The nests are built of mud, and are similar to

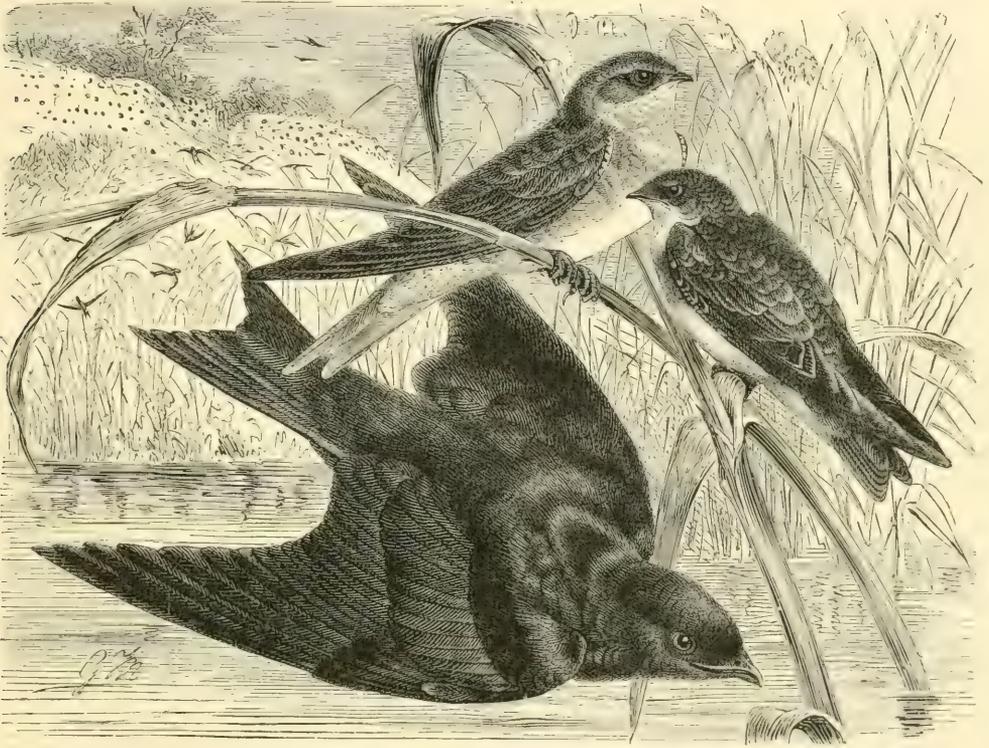
those of the house-martin, although having a curious funnel at the top, so that the whole structure recalls a chemist's retort. The adult male is purplish blue above, the feathers of the upper back being streaked with white; while the rump is pale rufous, merging into creamy white on the upper tail-coverts; the tail-feathers are blackish, glossed with dull blue; and the under-parts cinnamon-buff.

Martins.

Some of the martins (*Chelidon*) have the tail forked, while others have it squared; though all have the same short, broad bill and deep gape as the swallows proper, correlated with great length of wing and weak feet. The feathers of the rump are always white, and all the known species have the metatarsus and toes feathered. Of this widely distributed genus, one species is indigenous to Nipal, while another, the Siberian martin, breeds in Northern Asia, building its nests in crowded rows under the eaves of houses, and also rearing its young among the crags of limestone precipices. Blakiston's martin is a well-known Japanese species, which appears to pass the winter in Borneo. No bird is better known in Northern Europe than the black and white house-martin (*C. urbica*), which usually arrives there during the first spring months of the year. The birds which come to Britain are not the first migrants of their race; for we have seen house-martins nesting in Southern Europe in the middle of April, while many of their companions were still migrating in squads. Most people from long observation have come to believe that the house-martin never builds its nest in any position except against the side of some building; but it is a bird which adapts its habits in the breeding-season to whatever locality it happens to find itself established in. For example, in Norway, Mr. Chapman found house-martins breeding in the crags of the river banks; and we have seen them nesting in precipitous cliffs, as they do generally in some parts of Europe. The house-martin builds its nest generally during the month of May, but frequently finds its labours frustrated by the intrusion of a pair of sparrows which proceed to oust the rightful owners from their domicile. The nest is lined with feathers, and the eggs are pure white. It should be understood that the British Isles lie directly in the line of many birds when migrating from their breeding-grounds in Northern Europe to their usual winter-quarters in Africa: the birds that breed in the north of Europe naturally nesting later than those which breed further south. Consequently these northerners, or at least a proportion of their number, chiefly young birds, make their appearance in the British Isles in the month of November almost as a matter of course; and it is therefore only natural to expect that a few young house-martins tarry in England until the commencement of winter. Like the swallow, the house-martin is subject to some variation of plumage, although albinos are much rarer than amongst swallows. This species is the most gregarious of all the European swallows, and may often be seen clustering in hundreds upon the roofs of houses. The adult male has the crown and sides of the head, back, and wing-coverts rich bluish black; the rump and central upper tail-coverts are pure white; the wings and tail dull black; and the chin and all the lower parts dull white. The sexes are identical in colour, but the adults very unlike their sooty-brown young.

Sand-Martins. The slender, plain-coloured martins of this group (*Cotile*) possess a small depressed bill, broadest at the base; while the wings are long in proportion to the tail, which is slightly forked; and the feet are small and

slender. The metatarsus is bare, save for a tuft of feathers at its base. The sand-martins are pre-eminently gregarious in the nesting-season: the best known and most widely distributed member of the genus being the European species (*C. riparia*), which extends its range to Northern Asia and North America. The Indian species (*C. sinensis*) is resident throughout the northern portions of the Indian Empire; while Cowans' sand-martin is peculiar to the island of Madagascar; several species also inhabiting Africa. The common sand-martin (*C. riparia*) arrives in the northern parts of its breeding-range a week or two in advance of the larger swallows, and may generally be seen in sheltered situations during the last days



SAND-MARTIN AND PURPLE MARTIN ($\frac{1}{2}$ nat. size).

of March, frequently hawking flies under the crags that overhang salmon-rivers. It soon proceeds to the nesting-grounds, and commences to tunnel the chamber intended to contain its eggs in some sandy bank, gravel-pit, or railway cutting: although sometimes it digs a hole in the bank of a small stream, or even burrows in a heap of sawdust. The male sand-martin is a somewhat jealous bird, and often indulges in a struggle with some rival. The eggs, which are pure white without spots of any kind, are laid in a hole lined with stems of grass and feathers. When the young are able to fly, they join the company of other swallows and martins, and are constantly to be found by the riverside. The sand-martin leaves its summer-quarters earlier than its congeners, and its movements are less extended. On one occasion we fell in with thousands of these martins steadily migrating along the east coast of England, the air being literally full of birds for half an hour. flock

after flock streaming away south in the wake of their predecessors, and many small parties followed the main detachment during the day. The upper-parts of the sand-martin are uniform brown, as is the band on the breast; the lower-parts being dull white. The crag-martin (*C. rupestris*) spends the summer months among the mountain-ranges of Central and Southern Europe; as a rule frequenting rocks and old ruins, and nesting in inaccessible places in the month of March, the nests being often placed in the roofs of caverns in the rocks. Mr. Scott Wilson writes that he saw the crag-martin flying about the perpendicular crags of the Gemmi in June 1885, but observed it more particularly and found it breeding on the 1st June 1886 near Meiringen. In the Eastern Pyrenees the crag-martin builds under the eaves of the houses in the centre of the towns, the nests being large structures of mud, quite open at the top, and lined with feathers. The eggs of the crag-martin are white in ground-colour, profusely spotted with pale greyish brown. The general colour of the adult bird is a light ashy brown above; the lower-parts being creamy-buff; and the tail-feathers are dark brown, the central and outer pairs being conspicuously spotted with white.

Purple Martins. Dr. Sharpe divides the swallows into two groups, according to the character of the outer primary; the majority of genera belonging to the smooth-winged group; while the purple martins (*Progne*) of America and a few African species constitute the rough-winged group, in which the outer margin of the first primary presents a serrated edge in the adult male. The purple martins are birds of robust and elegant form, possessing a long and stout bill, broad at the base; long and pointed wings, and a tail much forked. Although they are most numerous in Brazil and the adjoining states of South America, one species summers in the United States, and another is a native of Patagonia. Darwin's purple martin is apparently confined to the Galapagos Islands; while the Caribbean purple martin is peculiar to the West Indies. The common purple martin (*P. purpurea*) is one of the most familiar of North American birds, and enters the southern borders of the United States as early as February, gradually extending its range over the country, the highest latitudes being reached only in the middle or end of May. In its habits the purple martin differs from most of its congeners in its predilection for nesting in cavities in hollow trees, such as the deserted holes of woodpeckers; this being especially the case in the Western United States. The nest-cavity is lined with fine stems of grass, leaves, and small twigs, quilted with feathers and other soft substances; and the eggs are pure white. Several pairs of birds often occupy the same nest, and the majority of couples are double-brooded. The purple martins leave their summer home in August, retreating into the interior of South America. The adult male has the entire body of a lustrous steel-blue; and the wings and tail bluish black. The female is dark greyish brown, but has the head and back glossed with blue.

H. A. MACPHERSON.

CHAPTER VI.

THE PERCHING BIRDS,—*concluded*.

Families *TYRANNIDÆ* to *MENURIDÆ*.

THE AMERICAN FLYCATCHERS.

THE members of the Passerine order described in the four preceding chapters are characterised by having the muscles of the syrinx, or organ of voice, attached to the ends of the half-rings of cartilage forming the windpipe: such muscles being generally of a very complex type. Hence these birds are termed the *Acromyodi*. Those remaining for consideration have, on the other hand, these muscles, which are simple and frequently consist of only a single pair, attached to the middle of the half-rings of the windpipe: and they are accordingly known as the *Mesomyodi*. Since none of them possess the high vocal powers of the first group, they are frequently spoken of as the songless perching birds. As their name implies, the members of the first family of this group are exclusively confined to the New World, where they are represented by upwards of four hundred species, the majority of which are South American. Insectivorous in their habits, the typical members of the family have the beak broadest at the base, from whence it tapers to a fine point, the upper mandible being slightly notched: while the nostrils are basal, and overhung, although not concealed, by bristles. The wing has ten primaries; and the tail, which is generally nearly even, although sometimes forked, is composed of twelve feathers. The metatarsus is relatively short, and the foot weak. The range of these birds extends from the Arctic region to Tierra-del-Fuego.

Tyrant-Flycatchers. The king-bird, or bee-martin (*Tyrannus carolinensis*), is well known in the United States for the audacity with which it attacks crows, owls, and hawks, and drives them away from the neighbourhood of its nest: and we have heard of a party of king-birds harassing a swallow-tailed kite, which eventually struck down one of its tormentors before it sailed away. The king-bird builds a conspicuous nest, usually choosing an isolated tree, often in an exposed situation: the nest being constructed of vegetable fibres and twigs, lined with horsehair, fine roots, and grasses. The eggs are rosy white in ground-colour, spotted and blotched with purple and reddish brown. Not possessing a true song, the king-bird merely utters a monotonous succession of twitterings. This species owes its trivial name of "bee-bird" to its fondness for the honey-bee; Dr. Coues stating that the king-bird destroys a thousand noxious insects for every bee it eats. Feeding largely upon winged insects, its flight when in pursuit of insects

is accomplished by rapid vibrations of the wings, the bird seeming to float in the air in the manner of a swallow. The king-bird arrives in its summer haunts in April and May, and prolongs its sojourn until September, when it migrates south. The male has the crown flame-colour; the upper-parts blackish ash; the wings dusky, edged with whitish; the tail black, tipped with white; and the lower-parts pure white, except the breast, which is shaded with grey.



KING-BIRD, AND BIENTEVEO TYRANT-FLYCATCHER ($\frac{1}{2}$ nat. size).

We owe an excellent account of this species (*T. sulfuratus*) to **Bienteveo Tyrant.** Mr. W. H. Hudson, who writes that in Buenos Aires "the bienteveo is found in every orchard and plantation: it is familiar with man, and invariably greets his approach with loud notes, especially with a powerful three-syllabled cry, in which people fancy there is a resemblance to the words *Bien-te-veo* ('I see you well'); while its big head and beak and strongly contrasted colours, especially the black and white head-stripes, seem to give it a wonderfully knowing look as it turns its head from side to side to examine any intruder. It is a loud-voiced,

garrulous bird, and has a great range of sounds, from grating screams to long clear, almost mellow, call-notes. It has one pretty habit which brings out strongly the pleasant feature in its character. The male and female are greatly attached; they do not go afield to hunt in company like the short-winged tyrant, but separate to meet again at intervals during the day. One of a couple (say the female) returns to the trees where they are accustomed to meet, and after a time, becoming impatient or anxious at the delay of her consort, utters a very long clear call-note. He is perhaps a quarter of a mile away, watching for a frog beside a pool, or beating harrier-like over a thistle-bed, but he hears the note and presently responds with one of equal power. Then perhaps for half an hour at intervals of half a minute the birds answer each other, though the powerful call of the one must



THE FIRE-EYE ($\frac{1}{2}$ nat. size).

interfere with his hunting. At length he returns: then the two birds perch close together, with their yellow bosoms almost touching, crests elevated, and, beating the branch with their wings, scream their loudest notes in concert, a confused jubilant noise that rings through the whole plantation." In its nidification, the bienteveo departs widely from the traditional habits of its congeners; unlike the majority of tyrants, which build small and shallow nests, this species constructs a very elaborate domed nest, which sometimes takes weeks to elaborate. It is placed in a tree without any attempt at concealment, and is composed of a variety of soft materials, especially wool. The eggs are cream-coloured, spotted with chocolate and purple, chiefly at the larger end. The bienteveo preys chiefly upon large insects such as beetles, which it invariably beats against the perch before swallowing them: but sometimes it carries off the callow young of other birds from their nests. It is also fond of fishing in shallow pools, preying upon tadpoles and small fishes: while occasionally it enters the slaughter-house in search of

pickings. It is a common thing to see a bienteveo waiting on a rural butcher's cart in hopes of securing some tit-bit. In the fall of the year it feeds largely upon ripe grapes, figs, and other fruit. The adult has the head black, with a large yellow crest and a white eyestripe; the upper-parts are brown; the wings and tail brown edged with rufous; and the lower-parts sulphur-yellow.

Ant-Birds. The type of this group (*Formicivora*) possesses a short conical bill, with the upper mandible hooked; while the wings are moderate, with the fourth feather the longest. The tail is fairly long and rounded, and the feet are furnished with long toes, adapted to progression over the earth, the claws being short and narrow. All the ant-birds are inhabitants of the forests of Brazil, a well-known species being the fire-eye (*F. domicella*), which frequents dense portions of the primeval scrub, creeping about the bushes, and rarely venturing into the open. It possesses a pleasing warbling note, and feeds upon a variety of insects. Its fondness for ants induces it to lay aside its usually cautious and retiring habits, and at times many individuals assemble together to devour ants in woodpecker-fashion. The adult male is nearly all black, and his plumage is set off to great advantage by his white wing-coverts and the fiery red irides of the eye, from which this species takes its name.

THE CHATTERERS.

Family COTINGIDÆ.

Some of the most gorgeous birds of South America are to be found in this family, which is remarkable for the variations of plumage exhibited by certain of its representatives. The chatterers have usually an arched bill, broad at the gape, and adapted to a frugivorous diet; the wings being generally of moderate length, although sometimes reaching almost to the extremity of the tail. The metatarsus is stout and scutellated in front. The greater number of the chatterers are inhabitants of the vast equatorial region of the Amazon, frequenting the interior of the forests, and leading an arboreal life; one of the loveliest being the Pompadour chatterer, so named after the famous Frenchwoman, to whom this and other specimens of birds were being sent, when the ship that bore them from Cayenne fell a prize to a British cruiser.

Umbrella-Bird. The singular bird for which the genus *Cephalopterus* was established has a stout, robust bill, with a strongly-arched upper mandible: the nostrils being open and longitudinal in shape, while the wings are long, and the tail is rounded. The umbrella-bird is, however, best distinguished by the possession of a curious crest, composed of straight, elevated feathers, the extremities of which curve outwards and form an elegant line of drooping plumes. The sides of the neck are naked, but long feathers spring from beneath the throat and from the sides of the neck, to form a loose lappet. Confined in its range to the forests of the plains of the Upper Amazon, the umbrella-bird (*Cephalopterus ornatus*) is a shy, retiring species, living in the higher branches of forest trees, where it readily obtains the wild fruits upon which it chiefly subsists. It has been seen by very few naturalists in its native wilds, but no doubt exists regarding its

peculiar vocal powers. Bates says: "The Indian name of this strange creature is *Uirá mimbéu*, or fife-bird, in allusion to the tone of its voice. We had the good luck, after remaining quiet a short time, to hear its performance. It drew itself up on its perch, spread widely the umbrella-formed crest, dilated and waved its glossy breast-lappet, and then, in giving vent to its loud piping note, bowed its head slowly forwards. The nest of the umbrella-bird is built of small branches, placed in the top of a tall tree." The eggs are white and two in number. In flight



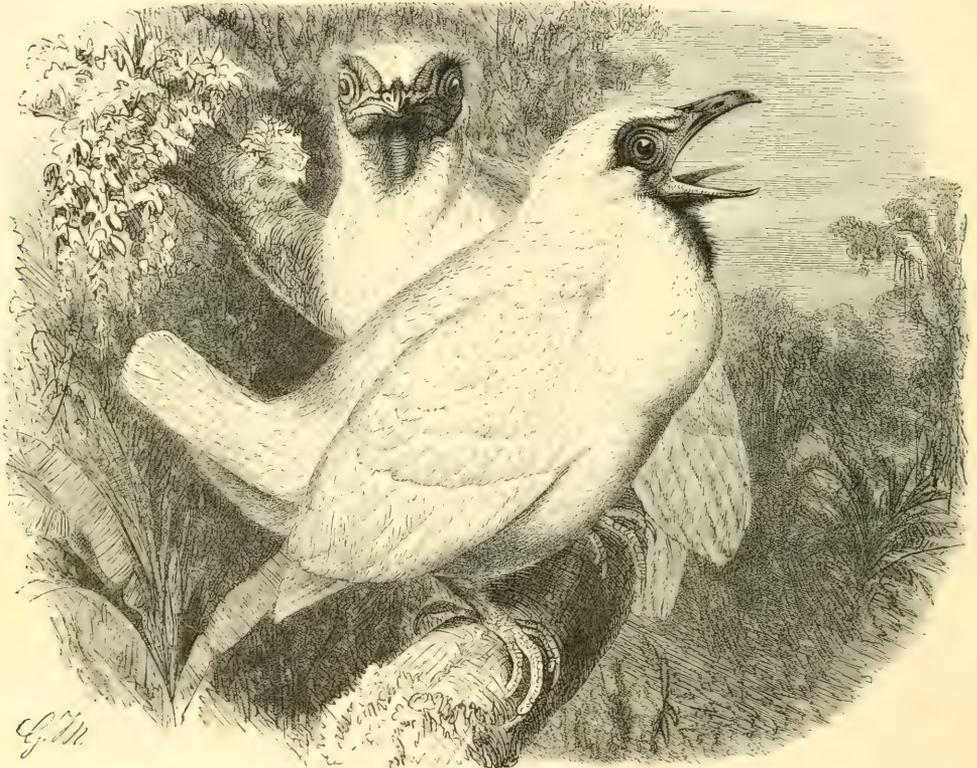
UMBRELLA-BIRD ($\frac{1}{2}$ nat. size).

the helmet or crest is depressed, and the lappet is placed close to the body. The plumage of the male is deep black throughout, the lappet being glossed with steel-blue. The female has only the rudiments of the crest and lappet, and is altogether duller-coloured than the male.

Bell-Birds.

Long known to travellers, in consequence of their remarkable vocal powers, so closely resembling the ringing of a bell as to have conferred upon them their popular appellation, three of the four known species of the bell-birds (*Chasmorynchas*) have the plumage of a pure unspotted white, an

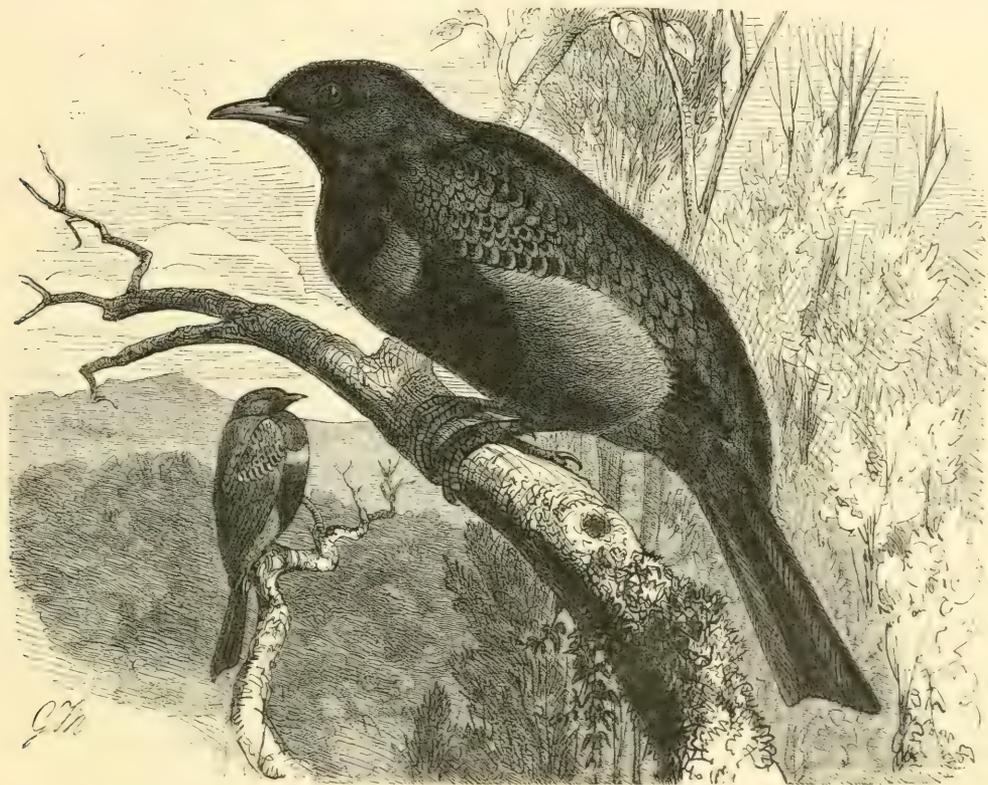
unique feature among the chatterers. The fourth species is, however, characterised by a brown head and black wings; although white predominates in its plumage. The bell-birds possess a moderately-curved bill, broad at the base and deeply cleft; the wings extending to the end of the upper tail-coverts, the metatarsus being strong and scutellated, and the toes short and strong. The variegated bell-bird is found in Venezuela, while the snow-white bell-bird inhabits the forests of Surinam, Cayenne, and Demerara, and the naked-throated bell-bird is found in Brazil. Dr. Sclater gives the following account of the naked-throated bell-bird (*C. nudicollis*), which is figured in our engraving:—"This bell-bird was first



NAKED-THROATED BELL-BIRD ($\frac{2}{3}$ nat. size).

made known to science by the French naturalist Viellot, in 1815, from specimens in the collection of the Jardin des Plantes at Paris. But the best and in fact only good account of it in a state of nature, is that given by that excellent and observing naturalist, Prince Maximilian of Neuwied, in his *Contributions to the Natural History of Brazil*. Prince Maximilian tells us that this remarkable bird is one of the most singular features in the fauna of the wooded coast-region of Brazil, and attracts the stranger's notice as well by its brilliant white plumage as by its clear ringing voice. It seems to be very generally distributed through the woods, resorting especially to the thickest and most secluded parts of them. Hence it resulted that the prince and his party, during their expeditions in the neighbourhood of Rio de Janeiro, became well acquainted with its singular notes some time

before they obtained specimens of the producer of them. Prince Maximilian describes these notes as resembling the sound of a clear-ringing bell, sometimes repeated at intervals, sometimes following each other in quick succession. In the latter case they are more like the sound produced by a blacksmith when he strikes a piece of steel upon an anvil, whence the bird has obtained its Portuguese name *ferreiro* (smith). The song is heard at all hours of the day, and when, as often happens, several of these birds are in the same neighbourhood, and begin singing against and answering one another, a most wonderful vocal concert is the result." Of this extraordinary bird a living specimen was first acquired for the aviaries of the Zoological Society

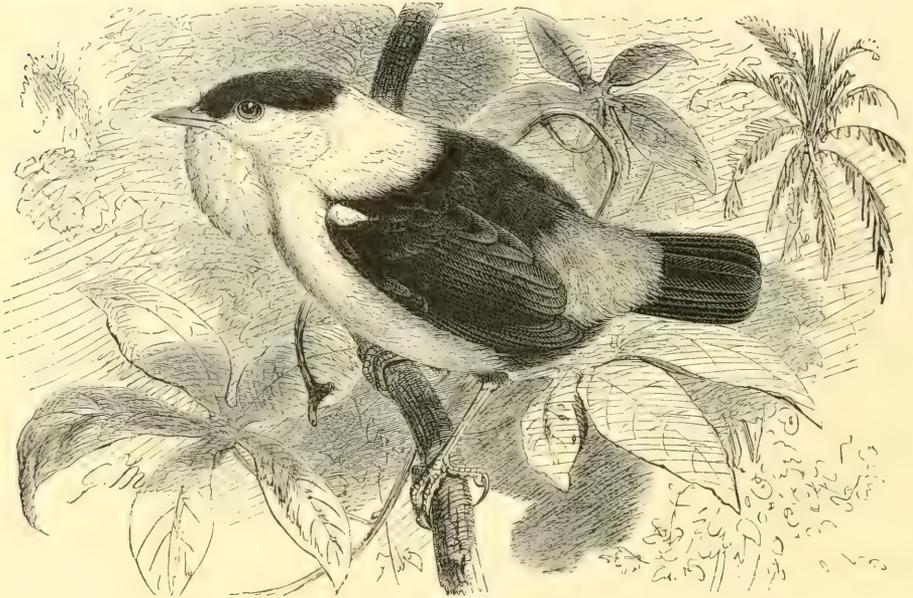


BANDED COTINGA ($\frac{2}{3}$ nat. size).

of London in May 1867. Shortly after it arrived in the Society's gardens it commenced its song, and continued to pour forth its peculiar notes at intervals of more or less frequency for several weeks. These notes have been described by an accurate observer in the following manner:—"The first note is a loud, harsh, and somewhat grating noise; this is followed by six or eight fine, clear, metallic, ringing notes, with an interval of about a second between each of them. The resemblance of these to the sound of an anvil is most extraordinary. The clear metallic ring, repeated at about the same rate that a blacksmith strikes upon the anvil, is so perfect that many persons on hearing it are unwilling to believe the sound could be produced by the delicate organs forming the vocal apparatus of so small a bird." So admirable is the imitation that, when the first bell-bird reached the London

Zoological Gardens, his clear ringing note was mistaken by one of the officials for the sound of a blacksmith ringing on an anvil, and inquiry was made by him as to the work that was going on." The adult male of the naked-throated bell-bird has the plumage pure white throughout, the space round the eyes and throat being covered with a naked skin, only sparingly invested with minute black feathers, which becomes of a fine green in the breeding-season. The female has a blackish head, and the upper-parts dull green; beneath, yellowish, varied with green.

Cotingas. The cotingas are a group of chatterers, distinguished from their near allies, the bell-birds, by the brilliancy of the coloration of the males. The type has the bill depressed, broad at the base, and narrowed towards the extremity, the upper mandible slightly arched; the wings being of moderate

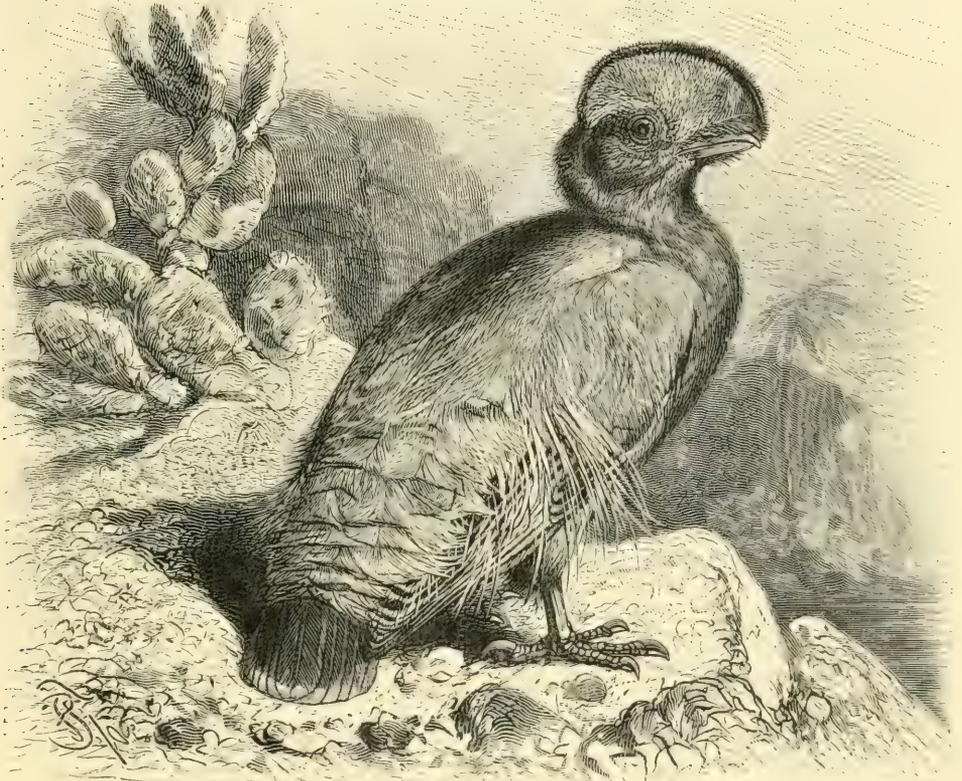


COMMON MANAKIN ($\frac{2}{3}$ nat. size).

size and pointed; the metatarsus short, and the toes stout, and furnished with fine claws. The cotingas inhabit the forests of Southern Brazil. The banded cotinga (*Cotinga cineta*) is a bird of solitary habits, keeping to the topmost branches of trees, and generally residing in a dense forest, though at times it approaches the cultivated grounds in search of food. It feeds upon a variety of fruits, which its wide gape enables it to swallow with ease. The adult male has the upper-parts and the band across the breast full ultramarine blue, while the under-parts are of a deep plum-colour.

Manakins. These birds (*Pipra*) are of gay appearance, generally exhibiting rich tints of blue, crimson, scarlet, orange, or yellow in combination with chestnut, deep black, black-and-white, or olive-green; and among their most obvious characteristics are their short bill and feeble feet, of which latter the fourth toe is united to the third toe for a good part of its length. Some few are crested; and the tail is very short in the majority of species, but in others the central feathers are much

elongated. Although the whiteheaded manakin has a wide distribution, ranging from the valley of the Amazon to the Isthmus of Panama, the majority of the species are confined to Brazil. Among them, the common manakin (*Pipra manacus*), which is spread over a large portion of South America, is a lively, active, restless species, generally to be seen in motion. Making its home in the dense scrub of aboriginal forests, avoiding large trees, and flitting through the bushes at a short distance from the ground, with a short but swift flight, it is a bird of social disposition, being rarely found solitary, electing to live a common life with its fellows. The



COCK OF THE ROCK ($\frac{3}{10}$ nat. size).

most curious fact about this manakin, and certain of its allies, is the circumstance that its wings are modified by the thickening of the shafts to produce a loud noise, which has been compared to the whirr of a spinning-wheel. The adult has the crown and upper-parts black, as are the wings and tail; the rump being grey, and the throat and under-parts white.

Cocks of the Rock. The birds of the genus *Rupicola* are remarkable for their brilliant coloration, especially that of the males, in all of which orange-red predominates. The type has the bill of moderate size, curving towards the extremity; the upper mandible being as wide as it is high, compressed at the base, and notched at the points; while the nostrils are oval, and hidden by the

feathers of the elevated crest; the wings short and rounded, with the fourth and fifth quills the longest; the tail of variable length; the metatarsus partially invested with feathers; and the feet large and strong. Of the group the best known species (*Rupicola crocea*) inhabits Guiana and the lower countries of the Amazon; while farther to the westward it is replaced by the Peruvian cock of the rock; a third species inhabiting Ecuador.

Although in confinement a somewhat indolent species, such is not the character of the cock of the rock in its native wilds. Sometimes a score or so of male and female birds of this species are observed to have assembled in the neighbourhood of an open space, and to be engaged in watching the performance of the most amorous males. While the dance is in progress the male appears to be entirely absorbed in the proper performance of his task; he gradually hops upwards, accompanying his movements with the most peculiar steps, swaying his head on all sides, and extending the wings; the exhibition is continued until the performer becomes tired, when he gives a cry which is understood by his fellows, and retires from the ring, leaving it to other male birds to continue the entertainment. It is much to be regretted that the brilliant plumage of the cock of the rock causes it to be sought out and shot for the purpose of trade; the adult male being almost wholly of a brilliant orange colour, but possessing a helmet-like crest, which adds to its beauty. The female lacks the brilliant coloration of the other sex, being almost entirely of a more or less uniform reddish brown.

THE PLANT-CUTTERS.

Family *PHYTOTOMIDÆ*.

Remarkable for the serrations in the cutting edges of the mandibles, these birds were formerly placed by naturalists between the finches and the hornbills; but they are now known to be more nearly related to the chatterers. They have the wings relatively short, and the tail long and even; their most marked characteristic being the short compressed bill, the cutting margins of which are minutely serrated like the teeth of a saw. The whole of these thick-billed birds are peculiar to the temperate regions of South America, being found in Chili, Bolivia, and Argentina, where they are represented by four species, all included in the typical genus *Phytotoma*.

The Chilian plant-cutter (*P. rara*), has long been known to naturalists for its destructive habit of feeding upon plants, which it cuts down, often wantonly, with its powerful bill. It builds in lofty trees, but the nests are frequently destroyed in consequence of the bird's mischievous habits; and, like others, this species has also suffered from persecution, owing to the ravages which it sometimes inflicts upon gardens and plantations. It is a plain-coloured bird of a dull grey above and below; with the wings and tail blackish, the coverts being tipped with white. Its voice is harsh and grating. A common bird in Patagonia is the redbreasted plant-cutter (*P. rutila*), generally found alone, but sometimes associating in small flocks. Not migratory, it resides throughout the year in its usual haunts; the male being often to be seen perching upon the top of a bush. Mr. Hudson says

that the bright red breast of the male bird gives it quite a gay appearance among the dull plumaged species that people the thickets of Patagonia. It builds a slight nest of fine twigs, lined with fibres, and generally placed in a thorn-bush: the eggs being bluish-green in ground-colour, with brownish flecks. The male bird has the upper-parts dull grey, with the tips of the tail-feathers and a wing-bar white; and the forehead and under-surface deep brick-red. The female is yellowish grey above, obscurely mottled, and the breast and under-parts buff with dark spots.

THE BROADBILLS.

Family *EURYLEMIDÆ*.

Deriving their name from, and readily distinguished by, the enormous breadth of their bills, which are generally associated with the possession of bright colours,



JAVAN BROADBILL ($\frac{1}{2}$ nat size).

the broadbills are the eastern representatives of the chattering of the New World. They are birds of fairly powerful make, having the upper mandible dilated at its base, and the tip of the beak abruptly hooked: while the wings are rather short, and the tail is short and rounded. The broadbills, which Wallace considers to be the survivors of a once extensive group, possess a very limited distribution,

ranging from the lower spurs of the Himalaya, through Burma and Siam, to Sumatra, Borneo, and Java.

The type of the genus *Eurylemus* has the bill broader than the head, the under mandible being very thin, particularly at the base; while the nostrils are basal, the primaries are slightly graduated, the tail short and rounded, and the feet moderately strong. These broadbills are found in the forests of tropical India, as well as those of Sumatra and the Malay Peninsula. Among the species the figured Javan broadbill (*Eurylemus javanicus*) was discovered upwards of ninety years ago by Dr. Horsfield in the eastern extremity of the island from which it takes its name. Sir Stamford Raffles found it frequenting the banks of rivers and lakes, feeding upon worms and insects; and it seems partial to the neighbourhood of water, building its nest in its aquatic haunts, often overhanging a pool. It is generally found in situations difficult of access, such as are covered with extensive forests, and are intersected with marshes and rivers. The plumage of the head, sides of the neck, and under-parts is violet, varying in intensity. The forehead is nearly black; the upper neck brown; the wings deep blackish brown, varied with yellow; the tail-coverts yellow, the feathers being black at the base; while the central tail-feathers are black, and the outer ones are black, with a white transverse band near the extremity.

THE PITTAS.

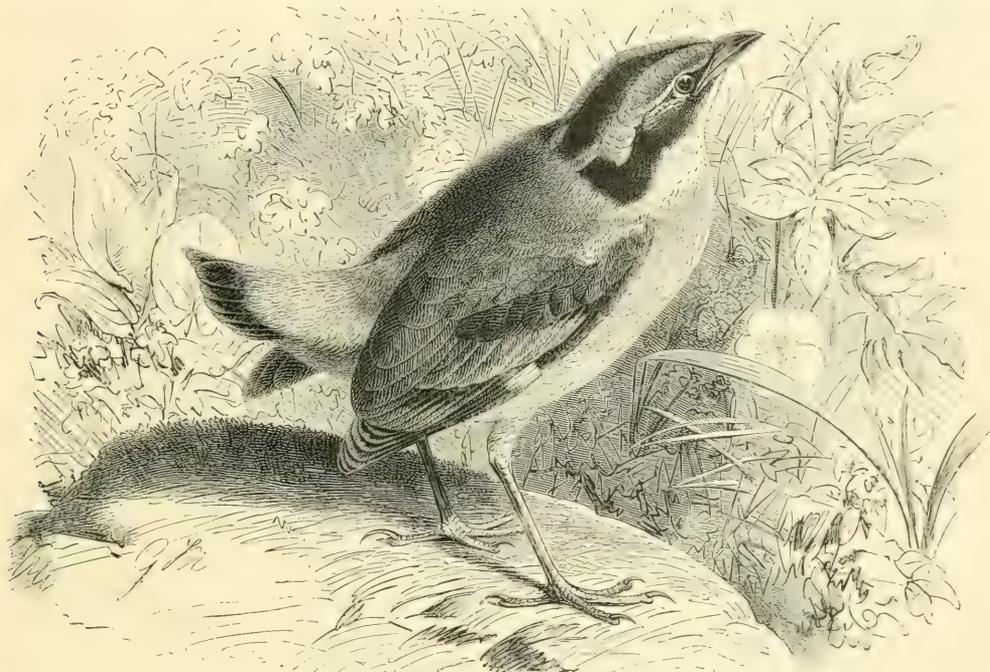
Family *PITTIDÆ*.

The pittas, or Old World ant-thrushes, are distinguished by the structure of the syrinx and the form of the wing, the first primary of the latter being of large size instead of being nearly suppressed, as in the other Passerines with ten primaries. They are birds of lovely plumage, blue and crimson adorning many of the species. The pittas are most abundant in the forests of the Malay Archipelago, especially in the islands of Borneo and Sumatra. The blue-naped pitta inhabits the Himalaya from Nipal to Assam; while the fulvous pitta is found in the ever-green forests of the hills of Pegu; and Sumatra is the home of the giant pitta. The rainbow pitta of Australia is a beautiful bird, golden green above with bright metallic blue shoulders, velvety black head and throat, and crimson abdomen; but the Malayan pittas are the most gorgeous of the family. Strange to say, a single species of pitta is found in West Africa.

Typical Pittas. The typical pittas (*Pitta*) possess no crests of elongated feathers, but are plain-headed, having a strong, thrush-like bill, gradually curved: while the wings are of moderate size, the first and second quills being but slightly graduated. The tail is very short, almost hid by the coverts, and may be broad and rounded or narrow and pointed. The feet are very long, and adapted to a terrestrial life; for the pittas pass most of their existence on the ground in the midst of dense jungle. They rarely fly long distances, except on migration, but their flight is strong and well sustained. These pittas may be regarded as the most characteristic birds of Borneo, where six species are found, three of the number being peculiar to the island. Of Ussher's pitta, Mr. Whitehead says: "The bright scarlet breast when turned towards one is not easily distinguished

from the scarlet fruits and bright red dead leaves which carpet these forests. The bird when alarmed generally keeps its dark back towards one, which is still more difficult to see in the dusky shades of the forest."

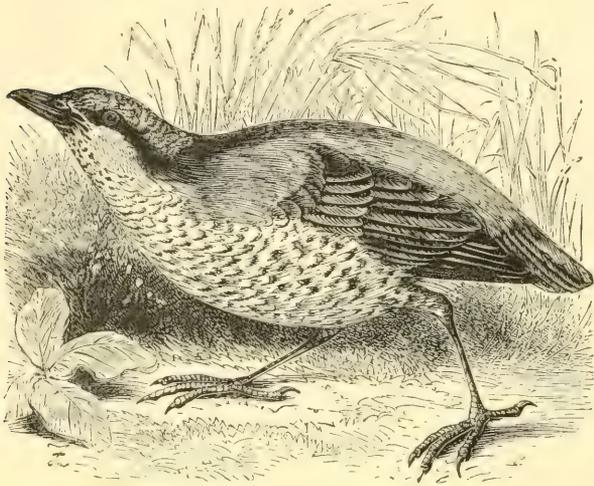
The Indian pitta (*P. brachyura*) ranges from the lower slopes of the Himalaya to Ceylon. Most common in forest-regions, in the Central Provinces, Mr. Oates says that it breeds in July and August, building a huge globular nest of twigs and leaves, on the ground or in a low branch. Mr. Hume says that few Indian eggs are more beautiful than those of this species, these being glossy white in ground-colour, marked with marone and purple. In the Carnatic, the Indian pitta occurs chiefly in hot weather, when the land-winds first begin to blow with violence from the west: and in



INDIAN PITTA ($\frac{1}{2}$ nat. size).

many instances it appears to have been blown by the gale from the eastern ghâts, for, being a bird of comparatively feeble flight, it is not well able to contend against the full force of the wind. At such times the pitta takes refuge in huts, outhouses, or any building that will afford it a shelter. The Indian pitta is a taciturn bird, though it possesses a fine loud whistling note: and it appears to be a migratory visitor to Ceylon, arriving from the north with the snipe. Although this pitta is a local migrant, being found in the southern part of its range in winter, and in the central and northern portions in the hot weather and rains, yet a certain number of birds appear to be constant residents in all parts of its range suited to its habits. During its sojourn in Ceylon, the Indian pitta is shy and wary, resorting chiefly to tangled brakes and ill-kept native gardens. It rarely alights on a tree, and is oftenest seen alone: but three or four individuals are sometimes met with in company. It feeds on beetles and other insects. The adult has the forehead, crown,

and lower-parts fulvous; a broad median band extends from the forehead to the nape; the back scapulars and upper-rump are green; the lower-rump, upper tail-coverts, and lesser wing-coverts pale blue; a broad black band passes



THE BLUE PITTA.

over the eye; the primaries are black, tipped with grey; the tail is black, tipped with dull blue; the chin and throat are white, and the lower abdomen and under tail-coverts crimson. The blue pitta (*P. cyanea*) which is found in Bhutan, Arrakan, Pegu, Tenasserim, and as far east as Siam, is a bird of considerable beauty, though far inferior in lustre to many of the Malayan species of the genus. Like other members of the family, it lives principally in dense scrub and jungle, obtaining its insect-prey upon the ground. It begins to

build its nest in the month of May, making a huge globular structure of dry leaves and twigs, placed upon the ground, and lined with fine twigs and grass roots. The eggs are white in ground-colour, marked with various shades of purple. The adult male has the forehead and crown greenish gray, changing to red, and giving place entirely to red on the nape, where the feathers are long and form a crest; the upper-parts and tail are blue, the primaries brown, with a white basal patch, the lores and a broad streak from the eye to the nape black, the chin and throat whitish, and the lower-parts light blue, barred with black.

THE WOOD-HEWERS.

Family *DENDROCOLAPTIDÆ*.

The wood-hewers are birds chiefly of a brown coloration, with more or less rigid tail-feathers; having the bill long or moderate and laterally compressed, and rather strong, straight, or curved; while the third, fourth, and fifth quills of the wing are the longest, the tail-feathers are stiff, pointed, and often of a ferruginous colour, and the claws of the feet are much curved. Upwards of two hundred and twenty species of wood-hewers are found, ranging from Mexico to Patagonia; no fewer than thirteen of these genera being confined to the high Andes and south temperate America, while fourteen are restricted to the tropical parts of South America. A single species is found in the Falkland Isles. Among this vast assemblage, the limits of space prevent our referring to more than two of the genera.

Oven-Birds.

The oven-birds (*Furnarius*) have the bill shorter than the head, laterally compressed and pointed, the upper mandible being

slightly curved; the wings are moderate, the tail consists of twelve feathers, and the feet are strong and adapted to terrestrial progression. The members of this genus range all over South America, eighteen species being restricted to the temperate regions. A well-known species in Paraguay (*F. rufus*), Uruguay, and Argentina is the red oven-bird, which enjoys a wide popularity on account of its familiarity with man, its loud ringing voice, and the



BROWN-FRONTED SPINE-TAIL AND RED OVEN-BIRD ($\frac{1}{2}$ nat. size).

wonderful mud-nest which it prefers to build near a human habitation, often upon a projecting beam or the roof of the house itself. Mr. W. H. Hudson says that in favourable seasons the oven-birds begin building in the autumn, and the work is resumed during the winter whenever there is a spell of mild, wet weather; the material used being mud, with the addition of horsehair or fibrous roots, which make the structure harder, and prevent it from cracking. When finished, the structure is shaped outwardly like a baker's oven, only with a deeper and narrower entrance. It is always placed very conspicuously, and with the entrance facing a

building if one be near, or, if at the roadside, looking towards the road. When the structure has assumed the globular form, with only a narrow opening, the wall on one side is curved inwards, reaching from the floor to the dome, and at the inner extremity an aperture is left to admit the bird to the interior, or second chamber, in which the eggs are laid. The interior is lined with dry and soft grass, upon which five white pear-shaped eggs are laid. The oven is a foot or more in diameter, and is sometimes very massive, weighing eight or nine lbs., and so strong that, unless loosened by the swaying of the branch, it often remains unharmed for two or three years. The birds incubate by turns, and when one returns from the feeding-grounds, it sings its loud notes, on which the sitting bird rushes forth to join in the chorus, and then flies away, the other taking its place on the eggs. The young are exceedingly garrulous, and when only half-fledged may be heard practising trills and duets in their secure oven in shrill tremulous voices, which change to the usual hunger-cries of young birds when the parent enters with food. After leaving the nest, the old and young birds live for two or three months together, only one brood being raised in each year. A new oven is built every year, and occasionally a second may be built on the top of the first, when this has been placed advantageously, as on a projection and against a wall. A somewhat curious circumstance occurred at the estancia house of a neighbour of Mr. Hudson at Buenos Aires one spring. "A pair of oven-birds built their oven on a beam-end projecting from the wall of a rancho. One morning one of the birds was found caught in a steel-trap placed the evening before for rats, and both of its legs were crushed above the knee. On being liberated, it flew up to and entered the oven, where it bled to death, no doubt, for it did not come out again. Its mate remained two or three days, calling incessantly, but there were no other birds of its kind in the place, and it eventually disappeared. Three days later it returned with a new mate, and immediately the two birds began carrying pellets of mud to the oven, with which they plastered up the entrance. Afterwards they built a second oven, using the sepulchre of the dead bird for its foundation, and here they reared their young. My neighbour, an old native, had watched the birds from the time the first oven was begun, feeling greatly interested in their diligent ways, and thinking their presence at his house a good omen; and it was not strange that, after witnessing the entombment of one that died, he was more convinced than ever that the little housebuilders are pious birds." The plumage of this oven-bird is earthy brown above, with a slight reddish tinge; the breast and flanks are pale sandy brown; the upper tail-coverts and tail are bright reddish brown. There is no difference in the colour of the sexes.

Spine-Tails.

The spine-tails possess a short straight bill, laterally compressed; the wings are very short and much rounded, with the primaries scarcely exceeding the inner secondaries; the tail is broad, with the shafts rather rigid, and the tips are pointed; while the feet are very large and furnished with slender claws. The white-throated spine-tail, like its congener the brown-fronted species (*Synallaxis frontalis*), is a native of the Argentine Republic, and Mr. Hudson says is a summer visitant to Buenos Aires; its arrival in spring being easily recognised by the utterance of its harsh persistent note, which is remarkably strong for so small a bird, reiterated for half an hour at a time with

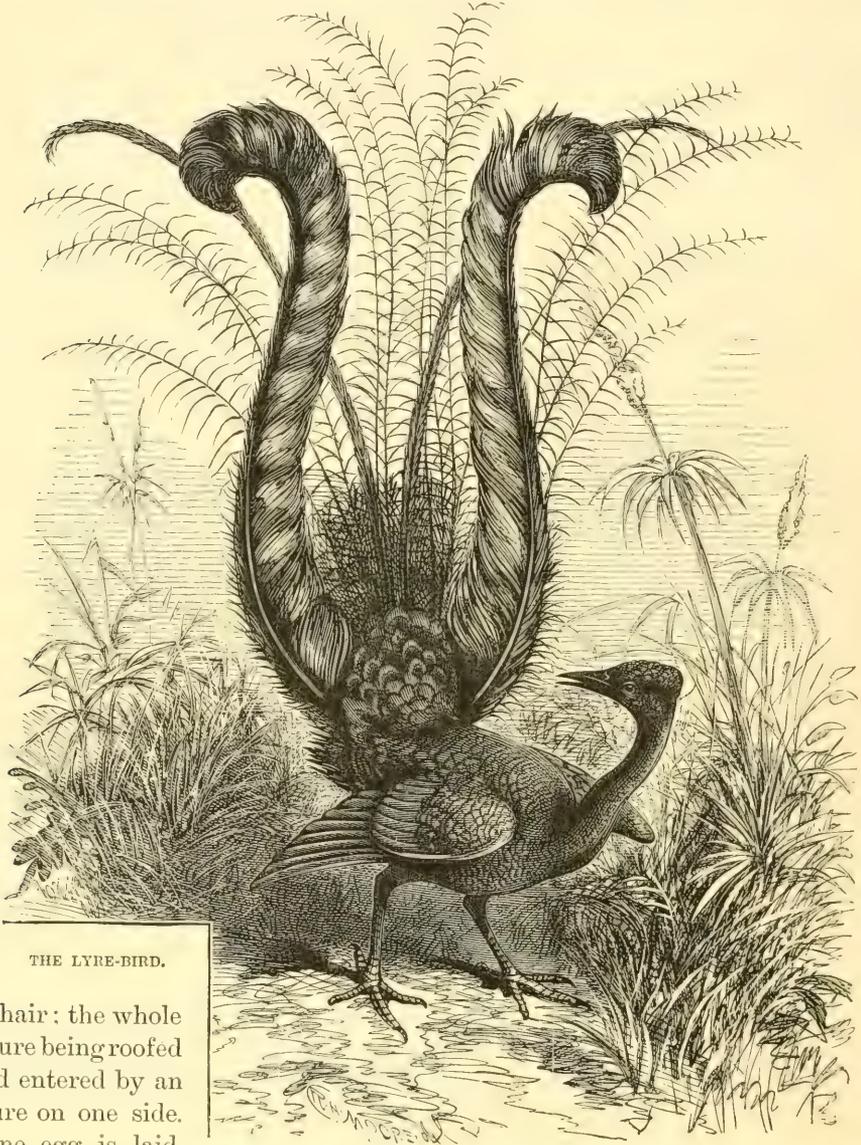
only intervals of a few seconds. The nest is placed in a low thorn bush, sometimes only two or three feet above the ground, and is an oblong structure of sticks twelve or fourteen inches in depth, with the entrance near the top, and reached by a tubular passage made of slender sticks six or seven inches long. From the top of the nest a crooked passage leads to the cavity near the bottom; this is lined with a little fine grass, and nine eggs are laid, pear-shaped in form and bluish white in colour. The nests are often entered through a long tube, built at a point about halfway up the side, and formed by the interlocking of thorny twigs; and although the diameter of the passage is only large enough to admit the old birds one at a time, yet they pass out with ease and rapidity. In Colombia this spine-tail varies the form of its nest, making it as large as that of an English magpie, and roofing the top with a mass of large leaves to protect it from the heavy rains. The adult bird has the forehead grey; the crown of the head pale chestnut; the sides of the head, neck, back, and tail, pale earthy brown; the upper wing-coverts pale chestnut; the primaries olive-brown; and the lower-parts white tinged with brown.

THE LYRE-BIRDS.

Family *MENURIDÆ*.

The last representatives of the order that can be mentioned here are the aberrant lyre-birds of Australia, where they are represented by three species, all included in the genus *Menura*, of which the typical and best known form is the common lyre-bird (*M. superba*) of New South Wales. Altogether abnormal in their structure, these remarkable and highly specialised birds can scarcely be assigned to either of the two great groups into which the Passerines are divided, and they must accordingly be regarded as standing to a great extent by themselves. Of very large size, the lyre-birds are especially characterised by the great development of the tail-feathers of the male, which assume a lyrate form, the majority being devoid of hooklets, and thus having the webs formed of separate plumules. The general colour of the plumage is brown; but while in the typical species the large pair of outer tail-feathers have reddish brown transverse bars on a light ground, in Prince Albert's lyre-bird (*M. alberti*) these feathers are uniformly coloured. The lyre-birds are remarkable for their power of imitating the cries and songs of other birds, this faculty being most developed in the species last mentioned; and they are also peculiar in making playing-grounds somewhat similar to those of some of the bower-birds. After remarking that he had never seen more than a single pair together, Gould observes, of Prince Albert's lyre-bird, that each bird appears to have its own walk or boundary, and never to infringe on the others' ground; for they may be heard day after day in the same place, and seldom nearer than a quarter of a mile to each other. Whilst singing, they spread their tails over their heads like a peacock, and droop their wings to the ground, and at the same time scratch and peck up the earth. They sing mornings and evenings, and more so in winter than at any other time. The young cocks do not sing until they get their full tails, which apparently is not until the fourth year; the two central curved feathers being the last to appear. Feeding upon small insects,

and more especially beetles, they commence nesting in May; the eggs being laid in June, and the young hatched in the following month. The nest is constructed of small sticks, interwoven with moss and fibres of roots; while internally it is lined with the skeleton leaf of the parasitical tree-fern, which in texture resembles



THE LYRE-BIRD.

horse-hair: the whole structure being roofed in, and entered by an aperture on one side. But one egg is laid,

and this is of a very dark colour, looking almost as though it had been smeared over with ink; the young bird, which is coated with down for the first month, remains in the nest for a period of about six weeks.

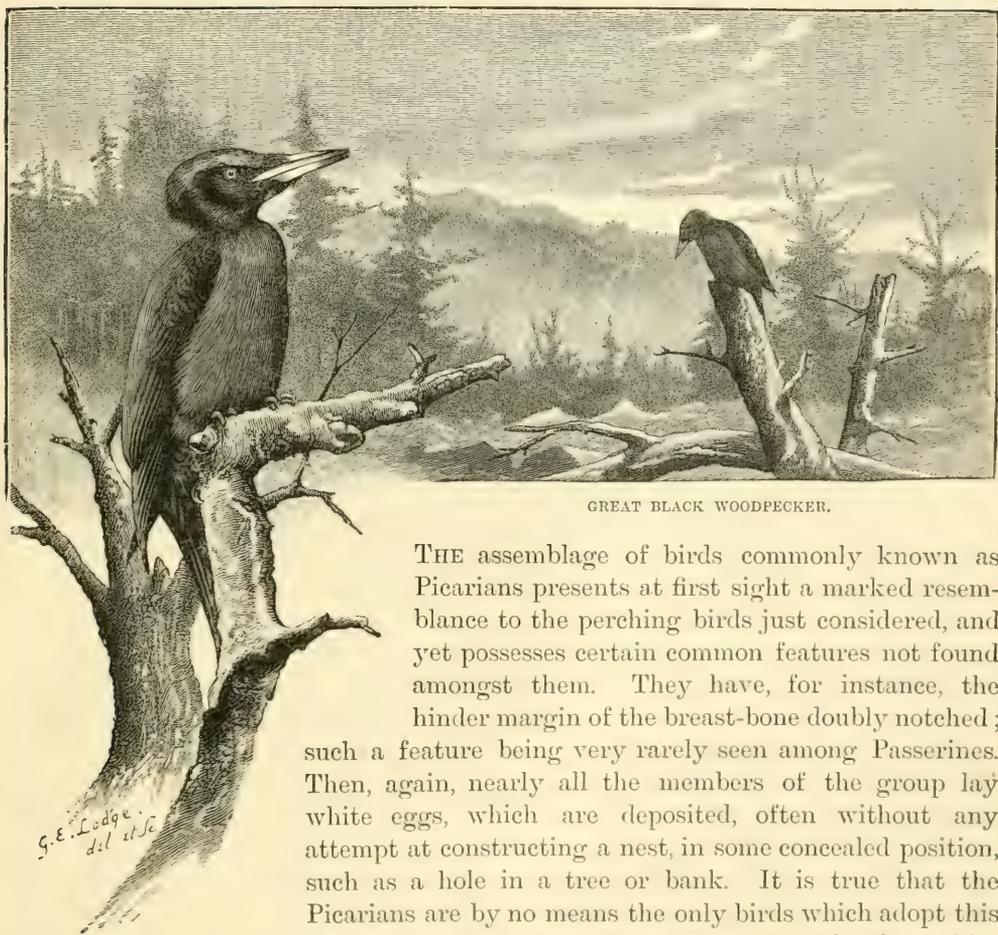
H. A. MACPHERSON.

CHAPTER VII.

THE PICARIAN BIRDS,—Order PICARLÆ.

JACAMARS TO TOUCANS.

Families *GALBULIDÆ* to *RHAMPHASTIDÆ*.



GREAT BLACK WOODPECKER.

THE assemblage of birds commonly known as Picarians presents at first sight a marked resemblance to the perching birds just considered, and yet possesses certain common features not found amongst them. They have, for instance, the hinder margin of the breast-bone doubly notched; such a feature being very rarely seen among Passerines. Then, again, nearly all the members of the group lay white eggs, which are deposited, often without any attempt at constructing a nest, in some concealed position, such as a hole in a tree or bank. It is true that the Picarians are by no means the only birds which adopt this mode of nesting, since many Passerines also lay white eggs and equally conceal them: the sand-martin, for instance, burrowing out a tunnel like the kingfisher, and depositing its eggs deep in the ground. There are, moreover, instances to the contrary, as in the case of pigeons, which lay two

white eggs in an open nest, while humming-birds, which are also Picarian, likewise build an open nest and lay white or light-coloured eggs. No definite rule can be laid down as to the nesting of the Picarians, and there are further exceptions, though of a modified kind, and capable of a different explanation, such as occur in the case of the cuckoos, some of which lay white eggs, and others variegated and coloured ones. Although, in addition to the above not very important features, there are certain osteological characters peculiar to the Picarians, such as the form of the upper arm-bone or humerus, which exhibits well-marked differences from the corresponding bone of the perching birds, the definition of the order by means of well-marked and exclusive features is by no means easy. The palate is sometimes of the so-called ægithognathous type, and at others of the bridged or desmognathous form; while the structure of the foot is variable in every degree, some Picarians having a foot in which the fourth toe is directed backwards, while in others the foot has the front toes joined together, so as to form a very flat perching surface. The Picarians may be divided into three chief sections, which may be called Scansores, or climbing Picarians; Coccyges, or cuckoo-like Picarians; and Coraciiformes, or roller-like Picarians; the chief differences between these groups occurring in the arrangement of the tendons of the feet, which need not be explained in a work of the present nature.

THE JACAMARS.

Family *GALBULIDÆ*.

Commencing with the climbing section of the order, our first representatives are the South American jacamars, of which about twenty species are known. All these birds have the so-called zygodactyle type of foot, in which the fourth toe is directed backwards parallel to the first. The bill is peculiarly long and straight; there is an aftershaft to the body-feathers, which does not occur in the allied group of the puff-birds; and there are some further differences in the arrangement of the feathers of the under surface, the tract on the breast having a branch on the throat. The number of tail-feathers varies in a somewhat peculiar manner, the normal number being twelve, but in two genera out of the six (*Brachygalba* and *Jacamaraleyon*) the outer feather on each side is wanting, thus reducing the number of feathers to ten. Although nothing absolutely decisive is known as to the breeding-habits of the jacamars, it is stated that in Tobago they build in holes in mud-banks, like the motmots, and lay pure white and nearly spherical eggs; while the three-toed Brazilian jacamar has been seen boring holes in banks as if for the purpose of nesting.

True Jacamars. Together with four other genera of the family, the true jacamars constitute a subfamily group; *Galbula* and the allied genus *Urogalba* having the middle pair of tail-feathers elongated, while in the others the tail is short and squared; the three-toed jacamars (*Brachygalba*) being notable for the feature from which they take their name. In these jacamars the prevailing colour of the plumage of the upper-parts is in most cases bronzy or metallic green. The green jacamar (*Galbula viridis*) is the best known species of the family, and is

found all over Guiana as far as the Lower Amazons to the south, and as Venezuela to the westward. It is of a coppery-green colour, with a bluish sheen on the crown, the under surface being chestnut, the throat white, followed by a band of bright green across the breast, and the outer tail-feathers blackish. An allied species is the red-tailed jacamar (*G. ruficauda*), which closely resembles the foregoing, but is distinguished by its rufous outer tail-feathers. It is an inhabitant of the same part of South America as the first, but does not extend into Amazonia, being found, however, further to the west, viz. in Colombia. In Trinidad, Mr. F. M. Chapman says that it is not uncommon at and near the borders of the forests. Its



GREEN JACAMAR ($\frac{2}{3}$ nat. size).

appearance, at first sight, would seem to support its reputation for stupidity, but closer observation will, I think, induce one to believe that these birds are by no means so stupid as they have been said to be. They are the most expert flycatchers I have ever seen, and this in spite of the fact that the shape of the bill would seem better to fit them for almost any other mode of existence. Sitting all drawn in on a dead limb, generally near the ground, they may be compared to a set spring. Their watchfulness permits no insect to pass in safety. They maintain a constant look-out, turning the head quickly from side to side, above, or even half-way round. The dart into the air is made with wonderful celerity. Sometimes it is straight up, again at various angles, and they go as far as thirty or thirty-five feet from their perch. As a rule they return to the same perch after each sally, and may occupy this for many minutes. As they rest they utter a singular call—a loud, clear, piping whistle, not unlike the call of a lost duckling.

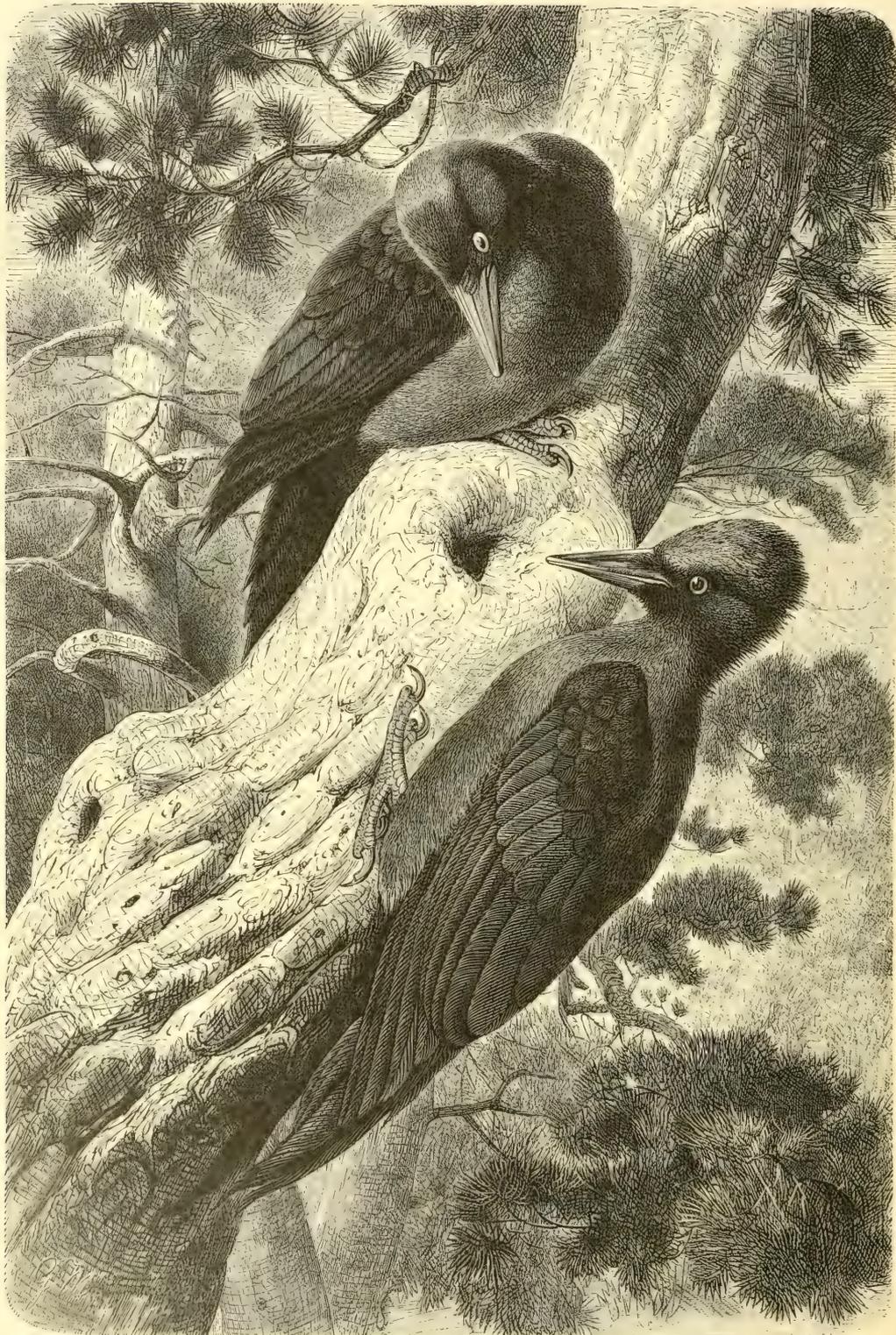
This is delivered in a variety of ways. Sometimes it is given as a single whole note, but it may be repeated at intervals of a second for minutes at a time. The dart into the air for an insect interrupts this musical reverie only momentarily, and, on returning to their perch, the plaintive calling is continued; at other times their notes are uttered more rapidly, and may rise into a high, prolonged trilling. This may be ground out as revolutions of sound, when the effect is most peculiar." Mr. Richmond says that on the river Escondido in Nicaragua he met with the black-cheeked jacamar (*G. melanogenia*) on three or four occasions. "It has a piercing cry resembling *kee-u*, with the first syllable very shrill, and strongly accentuated. The bird jerks its tail after the manner of a kingfisher."

Broad-Billed Jacamar. A single species (*Jacamerops grandis*) is the sole representative, not only of this genus, but likewise of the second subfamily of the jacamars. This bird is found from British Guiana to Amazonia, and thence to Ecuador, Colombia, and Panama. It is a bird of large size, fully 10½ inches in length, of the usual metallic-green colour above, chestnut below, with a large spot of white on the throat. It has a broader bill than any of the other members of the family, and is further easily recognisable by its large size.

THE PUFF-BIRDS.

Family *BUCCONIDÆ*.

Much resembling the Passerines in external appearance, and like them having twelve tail-feathers, as well as a shrike-like beak, the puff-birds are nevertheless true Picarians, having a bridged palate and zygodactyle feet; while the tendons which serve the toes are of the same type as in woodpeckers and honey-guides. There is no aftershaft to any of the contour-feathers; the oil-gland is naked; and the wing-coverts rather resemble those of the Passerines in their arrangement than the rest of the Picarians. Like the other members of the present order, puff-birds are believed to nest in holes, and to lay white eggs, but really very little is known about them. Confined to South America, the puff-birds have no representatives in the Old World, or even in North America. Seven genera are admitted by Dr. Selater, the names of which it will be unnecessary to mention, and forty-three species; the range of the family being from Honduras in Central America southward over the whole of South America, as far as Bolivia and Southern Brazil. Puff-birds are said to be generally woodland birds, being found singly or in pairs, and are considered to be of a rather sluggish and stupid nature. Dr. Selater says that they are a "purely arboreal and forest-frequenting group of birds, seeming to pass the greater part of their lives sitting upon the topmost or outermost branches of trees, generally selecting twigs that are dry and withered for their perch, and looking out for insects, which are captured flying, and which constitute their only food. The swallow-winged puff-birds (*Chelidoptera*) nest in holes in banks like kingfishers, and lay white eggs." Mr. Richmond, when in Eastern Nicaragua, met with Dyson's puff-bird (*Bucco dysoni*) in the forest on the Escondido River, where it was catching insects, and behaving very much like a tyrant-flycatcher. He says that



GREAT BLACK WOODPECKERS EXPLORING.

on making a capture it would seek a new perch, flying in a leisurely way, and showing considerable hesitancy about selecting a place on which to settle. The same observer also found the Panama puff-bird (*Malacoptila panamensis*) on the above-named river, where it was rather rare; stating that it is apparently confined to the thick forests, where it keeps among the lower branches, at times even descending to the bushes. A female bird shot by Mr. Richmond on the 23rd of May was "about ready to deposit eggs; it was shot from a twig directly in front of a hole in a bamboo, in which its nest was probably located. The stomach was distended with insects, principally locusts."

THE WOODPECKERS.

Family PICIDÆ.

Forming a kind of connecting link between the Perching Birds and the other members of the present order, the woodpeckers constitute a group of considerable interest. Like the majority of the order, the woodpeckers nest in holes, and lay spotless white eggs; but instead of having either the Passerine or the bridged type of palate, they have a somewhat intermediate form, in which the front of the bone termed the vomer is slender, pointed, and slit, instead of being truncated. Moreover, these birds have a distinctly climbing foot, thereby showing their affinity to the other climbing members of the order, such as barbets, cuckoos, or toucans. The structure of the tongue in woodpeckers is, however, entirely peculiar to the family, a similar arrangement of the extensile tongue-bones being elsewhere found only in the humming-birds and the sun-birds among the Passerines. The mechanism of the woodpecker's tongue is somewhat as follows. In the majority of these birds the tongue is long, worm-like, pointed, and barbed at the tip. To permit of its being projected or withdrawn as required, the extremities of the supporting bones are prolonged backwards, sliding in a sheath curving round the top of the skull; and the glands beneath it are greatly developed, secreting a viscid fluid, covering the tongue and causing insects to adhere to it. The peculiar modification of these organs and their application in procuring food are, indeed, closely analogous to those found in the anteaters and several other mammals, and the chameleon among reptiles. In some species the extremities of the tongue-bones slide backwards and forwards in the sheath as the tongue is retracted or protruded; while, in others, as in the common English green woodpecker, their ends are fixed to the sheath, and the protrusion of the tongue is caused by the action of a certain muscle diminishing the curve in which the extremities of the tongue-bones lie when the tongue itself is withdrawn. In only two American genera of the family is this remarkable structure absent. The bill in all the woodpeckers is strong and chisel-shaped, and is thus admirably adapted for hewing holes, and prising off bark to capture insects; the viscid secretion on the tongue being of great use in the latter function; but in the ground-haunting species the bill is less powerful.

There is very little variation in the habits of the member of this family; nearly all climbing trees, in the stems of which they bore out holes for their nesting-place; the direction of the aperture being at first horizontal and then

descending to a depth varying from a few inches to several feet. No nest is formed, the eggs, which are always glossy white, or pinkish white, being deposited on the chips which are accumulated by the birds during the excavation of the hole. They vary from two to seven or eight in number, but the average clutch is four or five. The young are hatched naked and blind; and in this state they remain for some time, although they soon become vigorous; the clamour with which they greet their parents, when the latter bring food to the nest, being proverbial. They soon learn to climb to the mouth of the hole, and even sleep in a hanging position. The tenacity with which the claws grasp the bark of a tree is often illustrated even in death, for sometimes a woodpecker, when fatally wounded by shot, automatically grips the trunk with such vigour as to remain suspended. The geographical range of the woodpeckers includes the whole of America, Africa, Europe, and northern and tropical continental Asia, although no species are found to the eastwards of Celebes, the group being entirely unrepresented in Australasia and the Pacific Islands. The only fossil representative of the group hitherto described appears to be one from the Tertiary strata of the Uinta Mountains, in the United States, and hence named *Uintornis*; but how close this comes to existing forms does not admit of determination.

Constituting a single family, the woodpeckers may be subdivided into two minor groups, namely, those with stiffened tails and those with soft tails. As with other climbing-birds, such as the creepers and wood-hewers, among the Passerines, the stiffened tail is an accessory to ascending trees. In the present group it is the shaft or stem of the feathers which is stiffened and elastic; the ends of the same being generally narrowed to a point, and the webs often showing signs of wear and tear, as the tail is constantly dragged along the rough bark of a tree, or is used as a support for the body of the bird, when the latter hammers away at the bark to procure its insect food. In some instances the tail-feathers assume a more remarkable shape, the hardened webs being turned inwards from their outer edges, so as to make a kind of hollow half-tube; this being particularly observable in the imperial woodpecker. The tail of some of the larger kinds of woodpeckers must, in fact, work havoc amongst the insects on the bark of a tree when the bird is climbing up; and we have seen the tail of a rufous woodpecker, in which the feathers were covered with the heads of ants on the under-side, numbers of the insects being attached to the tail-feathers of the bird.

Ground-Wood-pecker. The Cape ground-woodpecker (*Geocolaptes olivaceus*), the sole member of its genus, may be taken as our first representative of the typical subfamily of the group, in all the genera of which the tail is spiny, and has stiffened shafts to the feathers. The species under consideration is a dull-plumaged bird, of moderate size, and about 10 inches in length. The general colour is olive-brown, with yellowish brown shafts to the quills, and orange-brown shafts to the tail-feathers. There is some crimson on the rump, and also on the under surface of the body. The head is slaty grey, with a slight crimson moustache; and the colour of the eye is orange, but it has also been described as whitish pink. This curious woodpecker is common in certain parts of South Africa, where it enjoys a very limited range, being found in the Cape Colony, extending to the Orange Free State and Natal, but apparently not to the Transvaal. Mr. Layard

observes: "This singular bird presents a remarkable instance of the adaptation of creatures to the localities wherein their lot is cast. Though belonging to the woodpecker family it never pecks wood, but bores its way into the banks of rivers, sides of hills, or the walls of mud-buildings, in search of its prey, and for a home for its young. It also seeks for food on the ground, in the same manner as the golden-winged woodpecker of North America; its flight also struck me as very similar. It excavates a hole, sometimes several feet in depth, in which to deposit its eggs, which are pure white, and from three to five in number. Families seem to keep in company, until the arrival of the breeding-season separates them. They feed together, and roost together in some deserted hole, while their loud, harsh cries, as they call to each other, may be heard for a considerable distance." In Natal Mr. Thomas Ayres noticed this woodpecker on the Mooi River, creeping with much agility among the crevices and holes in some loose stone walls erected by the Kaffirs as enclosures for their cattle. Some of the birds were climbing up the face of a perpendicular rock, searching for insects exactly in the same manner as other woodpeckers examine a tree. These birds are fond of perching in twos or threes, sometimes in family parties, on a big rock or ant-hill, with the head and neck only visible to the intruder. Colonel Butler says that a nesting-place found by him in August, contained four fresh eggs, and the nest-hole was bored in soft earth on the face of a precipitous rocky bank or cliff overlooking a running stream. The eggs were laid in a depression in the ground, with no attempt at a nest, about a foot and a half from the entrance, the passage inclining slightly upwards. The general impression amongst naturalists, who have seen this woodpecker in a state of nature, is that the bird never perches on trees; but in the Orange Free State Mr. Symonds says that he saw a number of them sitting on the mimosa trees, chattering and making a great noise.

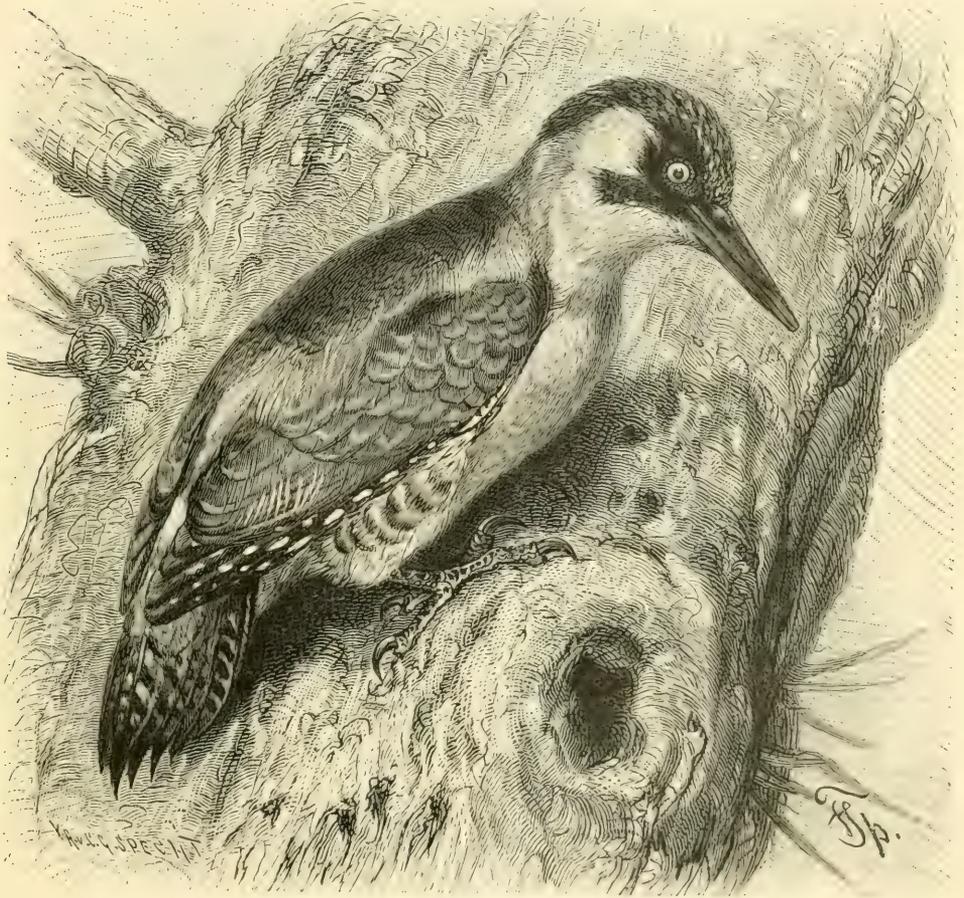
Bright-Shafted Woodpeckers. Peculiar to the New World, these woodpeckers are distributed over nearly the whole of North and South America, with the exception of some of the forest-districts, as in British Guiana, Venezuela, and parts of Amazonia and Ecuador, but representatives of the genus (*Colaptes*) occur again in Brazil, as well as in Peru, Chili, and Patagonia. The term golden-winged is due to the bright yellow shafts to the quills, the inside of the wing being also bright yellow; but there are some species to which the name does not strictly apply, such as *C. mexicanus*, in which the shafts of the quills and the quill-lining are red instead of yellow. In certain districts in North America where the golden-winged woodpecker (*C. auratus*) is defined as being chiefly a bird of the Eastern States, and the red-winged species (*C. mexicanus*), as a bird of the more Western States, there occurs a connecting species (*C. ayresi*) with an intermediate habitat between the two. It is not yet satisfactorily determined whether this curious form has been produced by the interbreeding of the golden and red-winged species, but the intermediate bird certainly partakes of the characters of both of them. The bill in these woodpeckers is rather more curved than in ordinary woodpeckers, and it is also weaker; while the birds themselves are less decidedly frequenters of trees, being more ground-feeders than the rest of the family. They excavate, however, their own nest-hole like the majority of woodpeckers; and they also perch horizontally on branches like ordinary Passerine birds instead of flying to a

tree trunk and climbing continually, after the manner of the other members of the family.

Golden-Winged Woodpecker. This species (*C. auratus*), familiarly known in the States as the flicker, is a bird about 11 inches in length, of a drab-brown colour above, barred with black, the rump being white; the head smoky grey, followed by a scarlet nape-band; while the sides of the face and throat are drab with a black moustache-band, and a crescentic patch of black on the chest; the remainder of the under surface being white, spotted with black; and all the shafts of the quills and tail-feathers golden yellow. A summer visitor to the sub-arctic parts of North America, and breeding even in the high north, in the middle and southern States this woodpecker is a permanent resident. It feeds largely on ants, and wanders over the open country in search of these insects, being far less of a forest-haunting species than most of its relations. An interesting account of the feeding of the young birds by the parents is given by Mr. Brewster, who says that when first he saw the nestlings there were five of them, about as large as plucked house-sparrows, and perfectly naked. Their eyes were tightly closed, and they appeared to be less than a week old. They were writhing and shivering pitifully, the air being cool and damp at the time. He watched the nest for about an hour, but saw nothing of the parent birds, and as a cold rain-storm began soon after, and lasted through the following night, he concluded that the young flickers would soon be dead. On the 1st of July, however, he found them all alive and vigorous; and then by dint of patience and careful observation he discovered the method by which the young were fed. After a little time the male bird became more accustomed to his presence, and visited the nest when he was not more than fifteen feet away from it.

Pampas Woodpecker. This woodpecker (*C. agricola*), is a remarkable bird, with a weaker bill than usually found in the family, while it has also longer legs and a less stiffened tail than is customary with woodpeckers; these modified characters being probably brought about by the peculiar habits of the bird, which, as its name implies, is an inhabitant of the pampas of Argentina. In size it is a somewhat large species, measuring 12½ inches, and has golden shafts to the wing-quills, but black ones to the tail-feathers, which are entirely black. The quill-lining is golden-buff, the crown of the head is black, while the sides of the face and neck as well as the fore-neck are golden yellow, inclining to orange, the chin and throat being white; the male has a red moustache, and the female a black one. Mr. W. H. Hudson writes that these birds "perch horizontally and crosswise, like ordinary birds, and only occasionally cling vertically to trunks of trees, using the tail as a support. They also seek their food more on the ground than on trees, in some cases not at all on the latter; and they breed oftener in holes in banks or cliffs than in the trunks of trees." In Patagonia he found the species breeding in the cliffs of the Rio Negro, but on the pampas of Buenos Aires, where the conditions are different, there being no cliffs or old mud-walls suitable for breeding-places, the bird resorts to the big solitary ombú-tree, which has a very soft wood, where it excavates a hole seven to nine inches deep, inclining upwards near the end, and terminating in a round chamber. In the treeless region, about the Sierra de la Ventana, in Uruguay, Mr. Barrows says that he noticed the birds about holes in the banks of streams, where they doubtless had nests.

Green Woodpeckers. Strictly birds of the Old World, these woodpeckers are plentifully distributed in the temperate portions of Europe and Asia, several species occurring in the Himalaya, and hence extending through the Burnese countries to the Malayan Peninsula, Java, Sumatra, and Borneo. In Europe there are three species, *Gecinus viridis*, *G. sharpei*, and *G. canus*, while in Algeria there is a fourth species of the same group, *G. vaillanti*, a species allied to the European ones; *G. awokera* occurs in Japan. All the other green wood-



COMMON GREEN WOODPECKER ($\frac{2}{3}$ nat. size).

peckers are tropical. The principal characteristic of this genus of woodpeckers is the green plumage, and they are likewise remarkable for the small outer or dwarf tail-feather, which is very short for the size of the bird. One of the most interesting of European birds, not only on account of its habits and bright coloration, but from its association with the poetry of Chaucer, who mentions it by the name of yaffle, by which it is known to the present day in many parts of the south of England, the green woodpecker (*G. viridis*) still "laughs loud" in many a woodland district. Its green colour, crimson crown, and yellow rump, render it conspicuous, and its dipping flight is peculiar, being a series of

long drops and ascents, unmistakable to the observer. Like many other birds of bright plumage, the green woodpecker is extremely shy, and is oftener heard than seen. If undisturbed, it may be seen to settle near the bottom of a tree and work its way up to the top, which it does very rapidly, hammering at the bark or prising it off, and gathering in its insect-food with its long suctorial tongue. It feeds largely on ants, and plays great havoc with the ant-hills, into which it digs great holes with its powerful bill. It is also said to attack wasps' nests for the sake of the grubs, and it will, according to Naumann, catch bees, as well as feed on acorns and hazel-nuts. The green woodpecker undoubtedly makes mistakes on occasions, so that it is not uncommon to find holes driven into trees by the birds and abandoned when the inside of the trunk or branch proved to be sound throughout. The beautiful symmetry with which the bird cuts the hole has often been remarked upon, the circular opening appearing as if it had been drilled in the tree. No nest is made, and the eggs, glossy white, and sometimes seven or eight in number, are deposited on the chips of wood accumulated during the process of excavation. Found in suitable localities throughout Europe, this species does not occur beyond the Ural Mountains, though it extends to Asia Minor and Western Persia. In Spain and Portugal its place is taken by Sharpe's green woodpecker (*G. sharpei*), and in Algeria by Le Vaillant's green woodpecker (*G. vaillanti*). Of one of the Himalayan species, the black-naped green woodpecker (*G. occipitalis*), a curious nest was found near Darjiling, and is recorded by Mr. Hume, who writes that "on the 17th of June Mr. Gammie took five hard-set eggs of this species out of a large regularly-formed nest placed at the bottom of a hollow in a tree; the nest being for all the world like that of some babbling-thrush, composed chiefly of coarse moss, roots intermingled with a little moss, and portions of a few broad dry flag-leaves. This was below Rungbi, near Darjiling, at a height of about five thousand feet. It was simply impossible, in my opinion, that the woodpecker should have had anything to do with the making of the nest; but it is very remarkable, I think, that it should even have accepted some other bird's nest as the receptacle for its eggs. The parent bird was captured on the eggs, so that there can be no mistake about the fact."

Grey-Headed Woodpecker. The grey-headed woodpecker (*G. canus*) ranges over the greater part of Europe, but does not visit the British Islands; and it also occurs in Siberia, Northern China, and the island of Yezo. Its habits are similar to those of the green woodpecker, which it also greatly resembles in size and colour, being about 12 inches in length. The under surface of the body, however, is perfectly uniform, without any crescentic marking as in most of the green woodpeckers; and the moustache-streak is black both in the male and female, the male usually having a red moustache. The nape is always grey, but the male has a red head and the female a grey one.

African Green Woodpecker. Passing over the American green woodpeckers (*Chloronerypes*), of which seventeen representatives are known, we come to the African green woodpeckers, all of which are confined to Africa south of the Sahara. Representing in that continent the American green woodpeckers, they have a similar coloration, but a more rounded wing. Fifteen species are known, but nothing remarkable has been recorded about their habits, and the published

notes only serve to show that these habits are like those of other woodpeckers of temperate climates. Thus Mr. Ayres writes of the golden-tailed woodpecker (*Campothera chrysurus*): "These woodpeckers are to be observed throughout Natal, wherever there is bush-land, singly or in pairs; their note is loud and harsh; they are very restless in their habits, constantly hunting for food as if they had never obtained a sufficiency. Ants and other insects appear to be their usual food, which



GREY-HEADED AND WHITE-BACKED WOODPECKERS ($\frac{2}{3}$ nat. size).

they search for and catch on the rough bark of trees. They also hammer away at dead boughs, from which they extract soft grubs, etc.; and their flight is heavy and dipping. This woodpecker makes a hole, for the purposes of incubation, in the trunk of a decayed tree, just large enough at the opening for the bird to enter, but becoming wider inside and reaching downwards to the depth of a foot or eighteen inches: it lays its eggs on the bare wood, without making any nest."

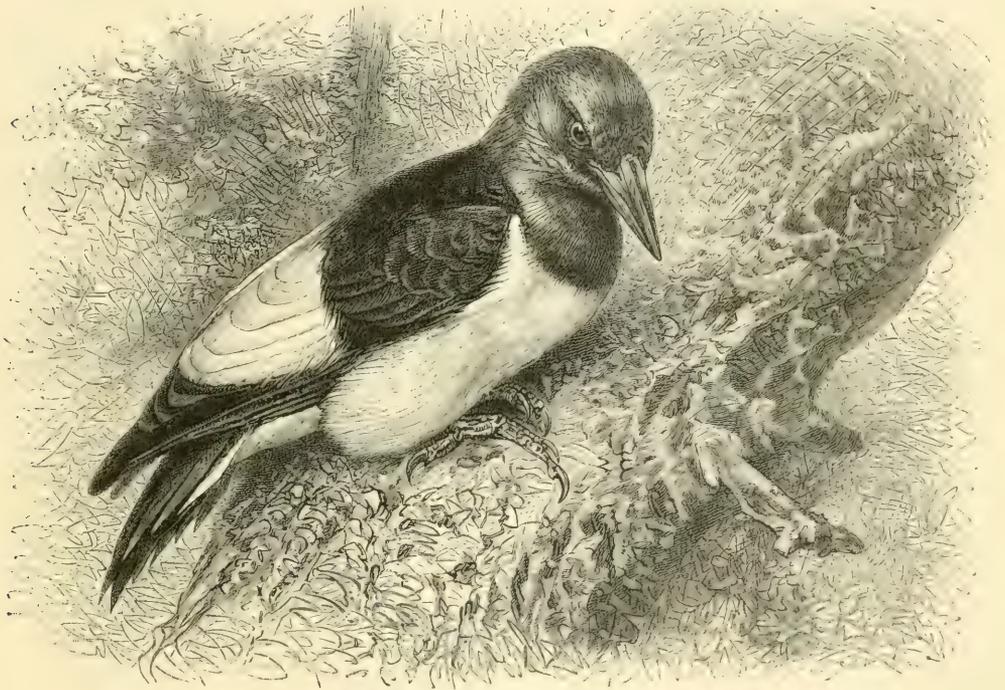
Several allied genera present no particular features. Such are *Chrysoptilus* of South America, with eight species; *Chrysoplegma* of India, Burma, and the

Malayan countries, also with eight species. The last-named genus is remarkable for its large yellow or red crest. Lewis's woodpecker (*Asyndesmus torquatus*) is an inhabitant of Western North America, extending into Arizona and Western Texas; and is remarkable for the structure of the body-plumes of the under surface, these being hairy in appearance, owing to the want of barbicules or hooklets to the web of the feathers. Its habits are also somewhat peculiar; and it is one of the few species in which the colour of the male and female is exactly alike. Dr. Coues writes: "This is chiefly a bird of the vast forests that clothe most of our mountain ranges with permanent verdure. My own experience with the bird in life is confined to the vicinity of Fort Whipple in Arizona, where it is a very common species—a bird of singular aspect, many of its habits are no less peculiar. One seeing it for the first time would hardly take it for a woodpecker, unless he happened to observe it clambering over the trunk of a tree, or tapping for insects, in the manner peculiar to its tribe. When flying, the large, dark bird might rather be mistaken for a crow-blackbird; for although it sometimes swings itself from one tree to another, in a long festoon, like other woodpeckers, its ordinary flight is more firm and direct, and accomplished with regular wing-beats. It alights on boughs, in the attitude of ordinary birds, more frequently than any other American woodpecker, except the flicker, and, with the same exception, taps trees less frequently than any."

Red-Headed Woodpeckers. The well-known North American red-headed woodpecker (*Melanerpes erythrocephalus*) is a representative of a genus exclusively American, and embracing thirty-three species, ranging from the United States to Argentina. In habits these woodpeckers seem to resemble the other members of the family, so that there is nothing particular to record respecting them. In the British Museum there may, however, be seen an illustration of the way in which one of these woodpeckers stores up acorns supposed to be for its winter supply of food. A piece of pine-bark has been pierced with a number of holes, drilled for the purpose of receiving the acorns. The species to which this habit has been proved to belong is the white-fronted red-headed woodpecker (*M. formicivorus*), inhabiting Central America, from Mexico to Panama.

Sap-Suckers. Three species of this genus are known, all of them North American and Central American in habitat; one of them (*Sphyrapicus varius*) also occurring in the West Indies. The genus does not possess the long extensile tongue of the other woodpeckers, sharing the want of this essential character with another North American genus (*Xenopicus*). Writing of the habits of the yellow-bellied sap-sucker (*S. varius*), Mr. F. Bolles observes: "I found a sap-sucker's 'orchard' of about a dozen canoe-birches and red maples, most of which were dead, some decayed and fallen. The tree most recently tapped was a red maple about forty feet high, and two feet through at the butt. The drills made by the woodpeckers began at eighteen feet from the ground, and formed a girdle entirely round the trunk. This girdle contained over eight hundred punctures, and was almost three feet in height. In places the punctures or drills had run together, causing the bark to gape and show dry wood within. The upper holes alone yielded sap, and from this I inferred

that what the birds obtained was the elaborated sap descending from the leaves through the fibres of the inner bark. I tasted the sap, and found it unmistakably sweet. The leaves on branches above the drills drooped, but those below were in good condition. I watched the drills on this tree from 12.30 P.M. until 2, and from 4 until 6 P.M., being concealed in the bushes to the north-west of the tree. During nearly the whole of this period of three and a half hours, one or more woodpeckers were in the tree engaged at the drills; they were a male, female, and two young birds. Four visits were paid by humming-birds in the time named, but the visitors were driven away by the woodpeckers. At 5.30 I shot one of the young birds in order to determine the number of individuals using the 'orchard.' His absence



RED-HEADED AMERICAN WOODPECKER.

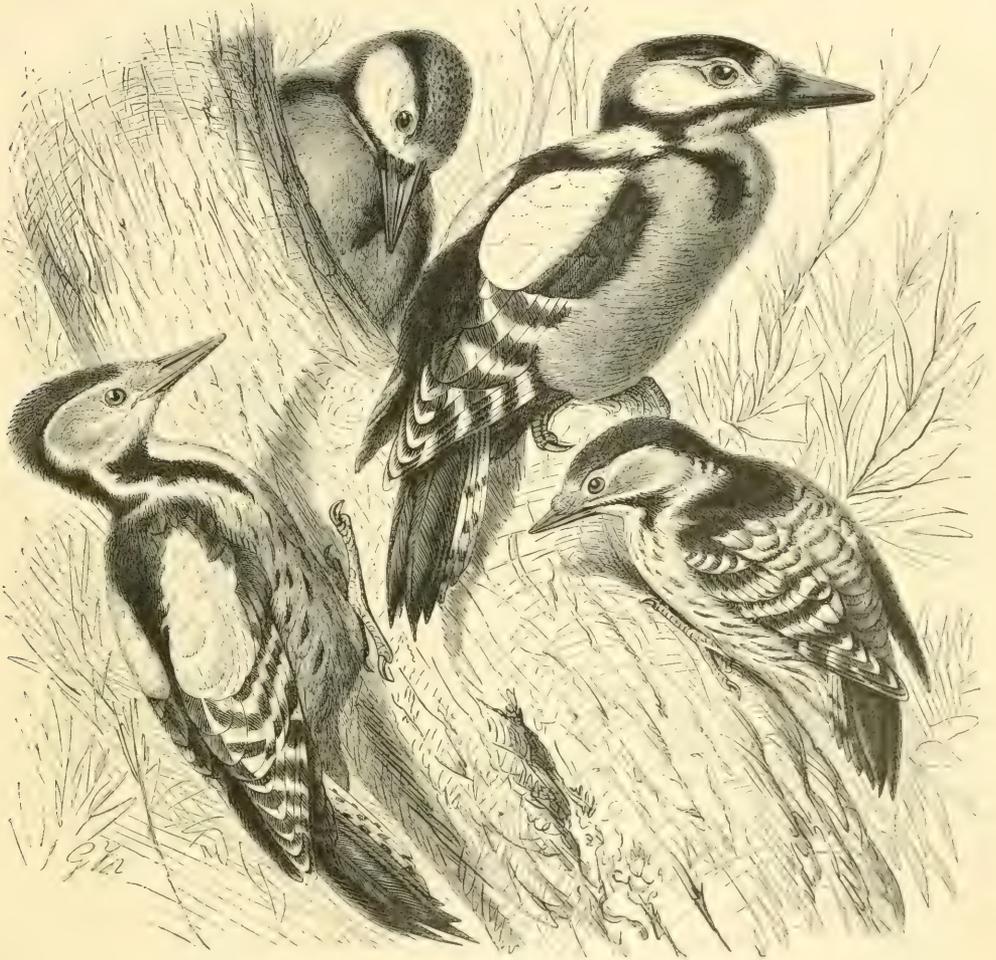
was unnoticed by the survivors. The next day the male, female, and one young bird were present, the tree being seldom left by all at once. Ten visits were paid by humming-birds; in five cases they reached the drills, and, hovering, drank sap from one or more of them. In the other cases, the woodpeckers being present, the birds were driven away. The work of the woodpeckers seemed to me, armed as I was with an excellent opera-glass and sitting not more than thirty feet from the drills, to be perfectly plain in character. During the morning the female drilled four or five new holes; they were above others in perpendicular series, and yielded sap freely. She was closely attended by the young one, who occasionally swallowed pieces of the soft bark, or cambium-layer, taken from the bottom of the drills: the female also ate some of it. When not drilling or resting, the female dipped sap from the holes near by. The male drilled no holes, but

dipped in those yielding sap. The dipping was done regularly and rather quietly, often two or three times in each hole. The sap glistened on the bill as it was withdrawn, and I could sometimes see the tongue move. The bill was directed towards the lower, inner part of the drill, which, as I found by examination, was cut so as to hold the sap. I looked carefully, again and again, to try and find insects in the sap, but none were there, although numbers crawled upon the bark. Occasionally, with a nervous motion of the head, the birds caught an insect. There was no doubt as to when they did this, either on the bark or in the air, for in swallowing an insect they always occupied an appreciable time in the process."

Mr. Bolles states that the birds consume the sap in large quantities for its own sake, and not for insect matter which such sap may chance occasionally to contain; that the sap attracts many insects of various species, a few of which form a considerable part of the food of this bird, but whose capture does not occupy its time to anything like the extent which sap-drinking occupies it; that different families of these woodpeckers occupy different "orchards," such families consisting of a male, female, and from one to four or five young birds; that the "orchards" consist of several trees usually only a few rods apart; that the forest-trees attacked by them generally die, possibly in the second or third year of use; and that the total damage done by them is too insignificant to justify their persecution in well-wooded regions.

Pied Woodpeckers. The genus *Dendrocopus* is not only widely distributed over the globe, but to it belong the best known English species, such as the greater and lesser spotted woodpeckers. There are altogether forty-six species spread over the greater part of Europe and Asia, as well as North America; but the genus is absent from Africa below the Sahara, although represented in Algeria and Morocco, as in Palestine and Syria. A resident species in most parts of the British Islands, a considerable number of immigrants arriving in the autumn, during which season a large number regularly pass over Heligoland, the greater spotted woodpecker (*Dendrocopus major*), with its conspicuous pied plumage, is a handsome and striking bird. A notable difference exists, however, between the coloration of the two sexes, the males having a red patch at the back of the head, totally wanting in the females, in which the entire head and nape of the neck is black. The young birds, on the other hand, have the crown red, thus possessing a more striking coloration than either of the parents, a feature not often to be seen in birds. So shy is the great spotted woodpecker, that but few people are acquainted with it in a state of nature, and even where the bird is known to occur, it is by no means easy to get a sight of it. Its single note, resembling the knocking of two stones together—a sort of *chit*—can be often heard, but the bird is not visible, having probably placed the trunk of a big tree between itself and the observer, after the manner of woodpeckers in general. In the spring it makes a peculiar drumming noise on the smaller branches of the trees or on the trunks of dead trees, and this noise, which appears to be a sort of signal-code between one bird and its mate, can be heard for a considerable distance. The species is found in wooded districts, but generally in park-lands, where hollow trees occur here and there; and in these the great spotted woodpecker bores for its nesting-place. The bird seems to pursue a kind of regular round of trees in search

of insects, beginning generally at the bottom and pursuing the uneven tenor of its way towards the top of one tree, sometimes visiting the larger branches on its way up, and betokening its presence by the loud taps which it bestows upon the bark, or by the fall of its pieces, as the bird prises them off with its awl-like bill. Although its chief food consists of insects, secured with great rapidity by means of its long and glutinous tongue, this woodpecker visits orchards and feeds on



GREATER, MIDDLE, AND LESSER SPOTTED WOODPECKERS ($\frac{1}{2}$ nat. size).

plums and cherries, while in the autumn and winter it will devour nuts, acorns, and berries. The least of the European species of the genus, and easily recognised by its small size and the five white bars on the wing, the lesser spotted woodpecker (*D. minor*) has in the male the crown red, while in the female the forehead and crown are white, with no red on the head at all. In general habits the present species closely resembles the last, but at certain seasons of the year it is found hunting for insects in orchards or on trees in the vicinity of houses, which is not the case with its larger relative. Being, like most of its kin, a shy bird,

it is not often seen, and, indeed, its presence is generally to be detected by its tapping on the trees, or when flying from one tree to another, at which times the black-and-white bars on the extended wings render it rather conspicuous. It often sits on a branch horizontally, or runs along the under side like a nuthatch. It has the habit, in the breeding-season, of making a drumming noise on the bark of trees, which can be heard for a great distance, and is evidently a call from one bird to the other, as its note is so weak that the sound of it would not travel far. This drumming is performed on the smaller branches of a poplar tree at a great height from the ground, and the nest-hole is also often drilled in the small branches of a poplar, near the top of the tree, making it a matter of some difficulty and danger to procure the nest. The range of this woodpecker is almost the same as that of the preceding species, and, like it, it is represented in North Africa and in Asia by allied species. Another species found in most parts of Europe, and supposed to have occurred once in England, is the white-backed woodpecker (*D. leuconotus*). As its name implies it has a white back, with a black mantle, a red crown, and broad black streaks on the flanks. The female, as in most other species of this genus, has a black head. Its range extends across Northern Asia to Manchuria and Corea. Generally placed in the same genus as the last, the middle spotted woodpecker (*D. medius*) is by some regarded as the representative of a distinct genus (*Dendrocoptes*), on account of its differently shaped beak, and its distinct style of plumage. Unknown in England, this species is distributed over the greater part of Europe, as far east as the Caucasus; but is replaced in Asia Minor and Persia by St. John's woodpecker (*D. sancti-johannis*).

Three-Toed Woodpeckers. Agreeing with three other Indian genera in the absence of the first toe; the seven species of three-toed woodpeckers are rather densely feathered birds, with an Arctic or Alpine habitat. Thus we find them distributed over the high north of America, Europe, and Asia, occurring only elsewhere on mountainous areas, where the same temperature is experienced, as, for instance, on the Rocky Mountains as far south as Mexico, the mountains of Germany and Switzerland, and similar localities in Asia, including the mountains of China, but not occurring in the Himalaya. One of the best known species is the European three-toed woodpecker (*Picoides tridactylus*), a bird of moderate size, measuring rather more than 8 inches in length, and easily recognised by the yellow head and white breast of the male.

Pigmy Woodpeckers. Merely mentioning that the African cardinal-woodpeckers (*Dendropicus*) are small-sized birds, differing from European forms by their shorter tail and rather longer legs, while most of them have yellow shafts to the quills of the wings, and the wing markedly rounded, we pass on to the pigmy woodpeckers (*Iyngipicus*). As their name implies, these are birds of small size, and generally of brown plumage, with white bars, while most of the species, instead of a red head, have a little ornamental tuft of red feathers on the side of the crown. The pigmy woodpeckers have also a more pointed wing than their allies, and their distribution is peculiar, since they are found in Senegambia and North-Eastern Africa where they are very rare, and then the genus reappears in India, where it is by no means uncommon, and thence extends through the Burmese

countries to China, and north to Eastern Siberia and Japan, while to the southward it is found throughout the whole of the Malay countries and islands, extending eastwards to the islands of Lombok and Flores. The habits of these woodpeckers are similar to those of the rest of the family, but they are stated to nest in horizontal boughs like a barbet, instead of hollowing out a hole for themselves in the trunk of a tree.

Crimson-Headed This (*Lepocestes pyrrops*) and the other species of the same **Bay Woodpecker** genus are characterised by their very long and stout bills; the nostrils being exposed, and not, as in the case of most woodpeckers, hidden by

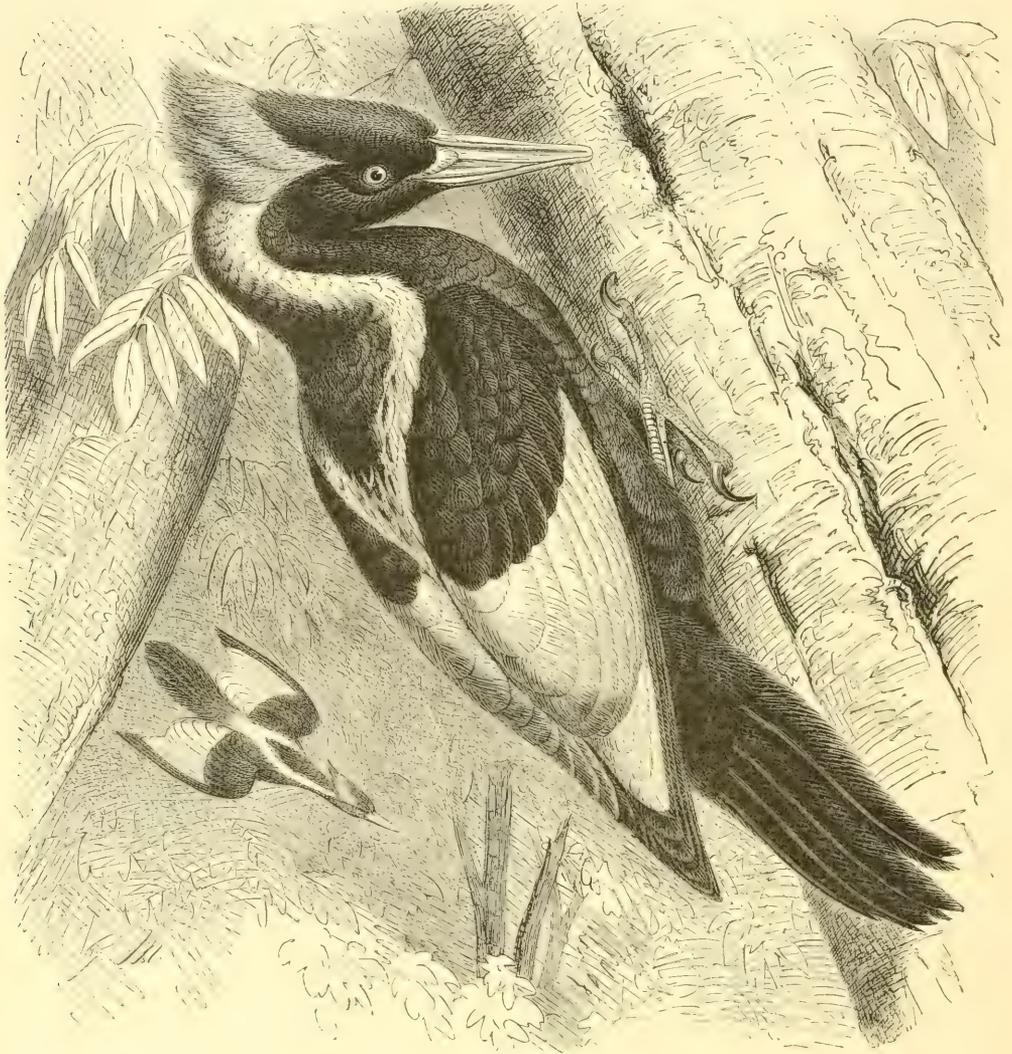


THE THREE-TOED WOODPECKER.

plumelets. This feature, and the very short tail in proportion to their size, may have been brought about by the peculiar habits of the birds, for Davison says that he was greatly puzzled when he first came across the species, and could hardly believe that it was a woodpecker at all.

Rufous Remarkable for their entirely rufous plumage, and for their **Woodpeckers**. nearly obsolete first toe, the claw on which is scarcely to be traced, the rufous woodpeckers (*Micropternus*) also lack the nasal "shelf" on the bill. Five species of the genus are known, ranging from India and China to the Malayan countries and islands. Mr. Oates describes the Burmese species (*M. phaeiceps*) as a very silent bird, seldom uttering a note, and creeping about in a quiet

stealthy way. Both he and Mr. Davison call attention to the bodies of the birds having a peculiar smell, and being smeared with some gummy substance. The latter writer adds: "They nearly always have their tails more or less studded with ants' heads. These are the large red ants of the jungle, who, when once they seize anything, never loose their hold. You may pick them to pieces, but their



IVORY-BILLED WOODPECKER ($\frac{1}{2}$ nat. size).

heads hold on still. They are the sumput-api or fire-ant of the Malays, and they bite unpleasantly. They seize hold of the tail-feathers of these woodpeckers: their bodies get rubbed off, but the heads remain, sometimes in scores, adhering to the lateral webs of the tail-feathers." In the Eastern Himalaya the present species also occurs, and builds in ants' nests; Mr. Hume stating that a nest of this bird was one of the most remarkable he has ever seen. From the end of a large

mango-branch ants of some species had constructed a huge almost globular nest about thirteen inches long and eleven in diameter, involving, as these nests commonly do, all the leaves and twigs springing from that part of the branch. The nest is a grey brown mass of a half felt-like half papier-mâché-like substance, into which the woodpecker had bored a circular entrance about two inches in diameter, and inside it he had scooped out a circular cavity some five inches in diameter.

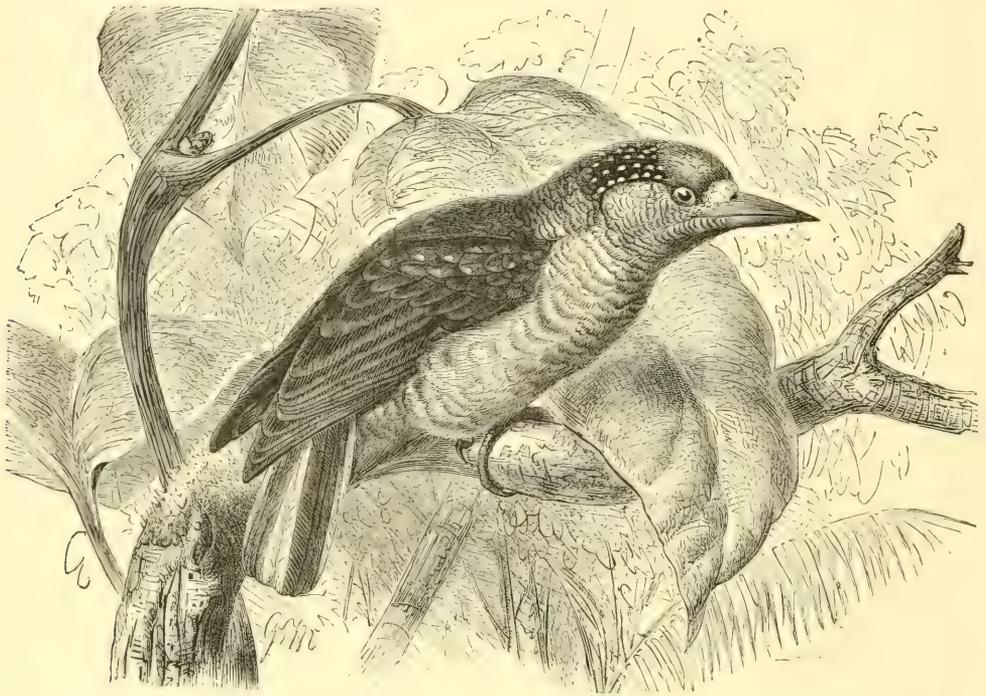
Ivory-billed Woodpeckers. With this genus we come to the second division of the more typical representatives of the family, which may be known as narrow-necked woodpeckers; the narrowing of the neck by which they are distinguished causing the head to appear disproportionately large. Common to both hemispheres, one genus of the group occurs in Celebes, and is thus the most eastern representative of the entire family. The group likewise includes the largest members of the assemblage, the great grey Malayan woodpecker (*Hemilophus pulverulentus*) being upwards of 18 inches in length. The ivory-billed woodpecker (*Campophilus principalis*), which is the typical representative of the genus under consideration, is now only met with in the coast country of Florida and the Gulf States of North America, although some half century ago it had a much more extended range, reaching to parts of the Southern and Central States. It appears always to have been a very shy bird, so shy, indeed, that Audubon relates that he once found a nearly completed nest, which was deserted by the birds when they perceived that their breeding-home was discovered.

Great Black Woodpecker. Although the generic term *Picus* was taken by Linnæus to include the whole of the members of the family, it is now restricted to the great black woodpecker (*P. martius*) represented in the Plate at the commencement of our notice of the family. The largest of the European woodpeckers, this species is a member of the narrow-necked group, but the plumage on the neck is denser than in any of its allies, probably on account of its inhabiting a more northern area and higher altitudes than any other member of the section. It has the third toe longer than the fourth, and further has the tarso-metatarsus clothed with feathers, indicating a woodpecker of a cold climate. It is a large species, measuring 17 inches in length, entirely black, with the top of the head and crest crimson in the male, the red in the female being confined to a triangular patch on the occiput. The species inhabits the pine-forests of Europe and Siberia, and occurs in Northern China and the north island of Japan. It has often been chronicled as a British bird, but no reliable evidence of its capture exists, and, as Mr. Seebohm well observes, "there is no bird less addicted to migration than the present species, and it is a bird of too powerful flight to be driven from its native pine-forests even by the heaviest gales."

The Piculets. While the whole of the preceding members of the family may be included in one subfamily, those remaining for consideration form a second. Diminutive in size, the piculets have the beak and the ways of a woodpecker, but they have a soft tail like the wrynecks, and not a spiny one like the majority of the family. Little is known about them beyond the fact that there are four genera, with a geographical distribution which is one of the most curious of any birds in the world. Two of these genera, *Picumnus* and *Nesocites*, have the

face feathered, and are chiefly represented in the New World, the last-named genus being peculiar to the island of San Domingo. *Verreauxia* and *Sasia*, the other two genera of piculets, are Old World forms, the former being an inhabitant of the forest-district of West Africa, and the latter of the Indian region. The largest of the piculets does not exceed 5 inches in length, and many of them are not more than 3 inches.

Until recently these tiny woodpeckers (*Picumnus*) were supposed **Green Piculets.** to be peculiar to South America, which contains no less than thirty-two species, but in certain parts of the Indian region a similar green piculet is found, together with a second species in Southern China; and Mr. Hargitt has



BRAZILIAN PICULET.

come to the conclusion that these Oriental birds are absolutely of the same form as the South American ones; the resemblance being carried even to the pattern of the tail, which is peculiar among birds; not only are the centre feathers half white, but the outer feathers are also for the most part white, and these characteristic markings run through the whole of the species, be they American or Oriental. Of the American species, although so numerous, scarcely any details of habits have been published, except that they seem to act the parts of tiny woodpeckers; but of the Indian species (*P. innominatus*) a little more is known. Inhabitants of the Himalaya and the adjacent ranges, reoccurring in the the Wynaad and extending down the high mountains of the Burmese Provinces, the Malayan Peninsula, Sumatra, and Northern Borneo, these piculets nest in holes which they excavate themselves, laying as many as seven eggs, as Mr. Thomson says that he

has seen as many young ones constituting a family and flying about with their parents. Mr. Gammie has found the species nesting in Sikhim, in decaying stumps of small trees, about three feet from the ground, in holes bored by the birds themselves, the entrance being only about an inch in diameter. The hole was three and a half inches deep, and little more than an inch wide all the way; and as with other woodpeckers there were no nesting materials.

Rufous Piculets. The rufous piculets (*Sasia*) differ from the preceding genus in having the sides of the face around the eye bare. They have only three toes, the first being absent. In the Himalayan species (*S. ochracea*) the general colour is rufous-olive above, rufous below; the forehead is golden-yellow in the male, rufous in the female, with a white stripe above the eye. In Tenasserim Mr. Davison found it frequenting moderately open country, especially where bamboos flourished. "It keeps to the undergrowth and secondary scrub and bamboo-jungle, working about the fallen logs. It is wonderful what a loud sound one of these little fellows can produce when tapping a bamboo. I have more than once thought that it must have been some large woodpecker, and was astonished when I could not see it, and when at last I did discover the tiny object I felt quite as much surprised at the sound it was able to produce as it was by my sudden advent. It is very fond of knocking about in low brushwood. I do not know its call, nor do I think that I ever heard one. It is usually alone, but sometimes pairs are met with." Mr. Hume has received a piece of bamboo, selected by the bird for its nesting-place, which was only two and a half inches in diameter. It was a dry bamboo, and into this, at a height of about three feet from the ground and six inches above the joint, the bird had drilled a small circular hole. Interiorly it had grooved with its little bill the whole inner aspect of the lower surface of the compartment, and the little, long fibrous strips thus obtained were collected at the bottom to form a bed for the eggs.

THE WRYNECKS.

Family *IYNGIDÆ*.

Of this family only four species are known, one enjoying a wide range in Europe and Asia, while the other three are confined to Africa south of the Sahara: these being *Iynx pectoralis*, inhabiting the eastern districts of the Cape Colony, Natal, and the Eastern Transvaal, and extending to the Lower Congo district in West Africa; *I. pulchricollis* is known from Eastern Equatorial Africa, where it was discovered by Emin Pasha; and *I. æquatorialis*, inhabiting the southern provinces of Abyssinia and Shoa. The wrynecks may be termed soft-tailed woodpeckers; and have the tail rather long, and not spiny; while the nostrils are not concealed by bristles, but partially hidden by a membrane. Their plumage is very remarkable, the whole of the upper-surface being mottled or vermiculated, as it is called, with a crowd of little wavy black lines. The English species is also known as the snake-bird, because of the curious way in which it twists and turns its head about, and elongates its neck, hissing all the way most vigorously, and spreading out the feathers of its head. It has an extensile tongue, like that of the wood-

peckers, but even longer than is usual in that family, and the way in which it darts its tongue out rapidly, completes the resemblance of the head to that of a snake, and has doubtless had something to do with its sobriquet of snake-bird. The common wryneck (*I. torquilla*) is a summer visitor to Europe and Northern Asia; in many parts of Great Britain being known, besides its name of snake-bird, as the cuckoo's-mate, since it generally arrives a little before that bird, and is supposed to be a harbinger of the cuckoo's arrival in the spring. It is also called in some parts of England the pee-pee, doubtless from its curious note, which resembles the words *pee-pee-pee* uttered in a somewhat shrill voice. In



WRYNECK.

summer the wryneck is found over the greater part of Europe and Asia, extending even to Japan; its northern range being about 62° north latitude. Both the Indian and the Japanese birds have been considered to be distinct, but Mr. Hargitt recognises but one form. The Asiatic birds which breed in the countries north of the Himalaya, and even in Kashmir, winter in the Indian Peninsula, and the Japanese birds in China and the Burmese countries. The European wrynecks appear to winter in Northern Africa and extend to Abyssinia, and on the west coast to Senegambia. The wryneck does not climb trees like a woodpecker, though it clings to the trunk of a tree in pursuit of its insect-food. It feeds largely on ants, and is often seen on the ground in pursuit of its prey; and, unlike the

woodpecker, it does not bore a nest-hole, but selects one in a tree, generally a decayed fruit-tree, as it is fond of frequenting orchards. The eggs are sometimes as many as ten in number, but the average number is seven or eight. They are white like those of a woodpecker, but not quite so glossy.

THE HONEY-GUIDES.

Family *INDICATORIDÆ*.

Long classified with the cuckoos, which they resemble in the structure of their feet, while they are also believed to lay their eggs in the nests of other birds, the honey-guides are now recognised as a distinct group. In place of selecting totally different birds, the honey-guides appear to choose for victims their own nearest kindred, such as the barbets and woodpeckers; the little honey-guide depositing its white eggs into the nests of the red-vented woodpecker, the little tinker-barbet, or the pied barbet, while the large white-backed honey-guide selects the banded barbet as its victim. In structure the honey-guides are now admitted to be akin to woodpeckers and barbets, having many characters in common with both those groups,

especially as regards the zygodactyle foot. The oil-gland is tufted, and there are no blind appendages (cæca) to the intestine. The honey-guides are principally African, no less than ten species out of twelve being found in the Ethiopian region. In the Himalaya, however, the yellow-backed honey-guide is a resident, and in the mountains of the Malay Peninsula and in Borneo occurs the most eastern representative of the genus, the Malayan honey-guide.

Two genera only are known, the true honey-guides (*Indicator*) and the dwarf honey-guides (*Proloriscus*). The latter genus contains two species, one from South-Eastern, the other from Western and Equatorial Africa, both of them



WHITE-EARED HONEY-GUIDE ($\frac{1}{2}$ nat. size).

having only ten tail-feathers instead of twelve, like the rest of the honey-guides. Sir John Kirk states that "the honey-guide is found in forests, and often far from water, even during the dry season. On observing a man, it comes fluttering from branch to branch in the neighbouring trees, calling attention. On being followed, it goes further; and so it will guide the way to a nest of bees. When this is reached, it flies about, but no longer guides: and then some knowledge is needed to discover the nest, even when pointed out by the bird to within a few trees. I have known a honey-guide, if a man, after taking the direction for a little, then turns away, to come back and offer to point out another nest in a different part. But if it does not know of two nests it will remain behind. The difficulty is that it will point to tame bees in a bark hive as readily as to those in the

forests. This is natural, as the bee is the same; the bark-hive, Musinga, as it is named, being simply fastened up to a tree, and left for the bees to come to. The object the bird has in view is clearly the young bees. It will guide to nests having no honey, and seems equally delighted if the comb containing the grubs be torn out, when it is seen pecking at it." The little honey-guide (*I. minor*) is only 6 inches in length. It is said to be of no repute as an honey-guide, but it catches bees like a flycatcher. The white-eared honey-guide (*I. sparrmanni*), is one of the larger members of the genus, about 8 inches in length, of an ashy brown colour above, whitish below, with a brownish shade on the throat. The three outer tail-feathers have their bases white, and there is also some white on the lower back and upper tail-coverts; on the shoulder is a yellow band, formed by some of the lesser wing-coverts. This species is found over the greater part of Africa, from the Eastern Cape Colony to the Transvaal, and thence throughout Eastern Africa to Abyssinia, and again occurring in Senegambia, so that it is an inhabitant of the open portions of the continent, but does not occur in the forest-regions of the West Coast. It is a favourite with the natives, who do not like to see one killed. Mr. Buckley, during his journey to Matabililand, says "that the birds were extremely pertinacious in following us, in order to conduct us to a bee's nest, chattering incessantly until they gained their point."

THE BARBETS.

Family CAPITONIDÆ.

This family occupies an intermediate position between the woodpeckers and the toucans; in many of their ways these birds being like the former, while some of their number bear a remarkable resemblance to the toucans. In structure they also have many points in common with these two families, the peculiar zygodactyle foot being exactly like that of the woodpeckers and the other allied families. The barbets have a tufted oil-gland, no blind appendages to the intestine, and possess ten tail-feathers. They have little in common with the puff-birds, which are also called barbets in many works on natural history. The barbets are found in the tropical portions of both the Old and New Worlds, the latter being peculiar to Central and South America. From Brazil and Bolivia up to Costa Rica the American barbets range, but no species has yet been found in Guatemala or in Mexico. In most of the Old World barbets the bill is toothed or ridged, but in the American genus (*Capito*) the bill is smooth, not toothed, and has the ridge rounded. In South America also occurs the singular genus *Tetragonops*, wherein the bill is four-sided and the lower mandible widened at its tip, so as to form a sort of cradle in which the end of the upper mandible rests. Two species of the genus are known, one from Costa Rica (*T. frantzi*) and the other from Ecuador, the latter being a brightly-coloured bird, named *T. rhamphastinus*, from the similarity of its colours to that of a toucan. Barbets are found in the tropical portions of Africa and Asia, but do not extend beyond the Malaysian Islands. Of the seventeen genera recorded from the Old World, Africa claims ten and the Indian region the other seven.

Tooth-billed Barbets. These birds (*Pogonorhynchus*) are distinguished by the presence of one or more distinct notches or teeth in the edge of the bill, and in some of the species there are deep grooves or ridges, similar to those which occur in some of the hornbills; while there is a sort of beard of coarse bristles on the chin in the red barbet of West Africa (*P. dubius*).

The genus *Melanobucco*, also one of the group of tooth-billed barbets, has thirteen species distributed over various districts of Africa. They are described as frequenting the neighbourhood of woods and bush-country, feeding on fruits



CRIMSON-BREADED BARBET ($\frac{2}{3}$ nat. size).—After Keulemans.

and berries, seeds and insects, and nesting in holes of trees, but not making the holes themselves. The black-collared barbet (*M. torquatus*) is said by Mr. Ayres to have a particularly loud note, of which the syllables *kook karoo*, repeated eight or ten times, would give a good idea. Frequently both male and female call at the same time, and, when perched close together, keep up a quick succession of bows to each other, bowing at the repetition of each note. Of the pied barbet (*M. leucomelas*), Mr. Andersson says that in Danaraland it is found singly or in pairs, and is remarkable for its clear-ringing and far-sounding notes, which, heard at all hours of the day, are most frequent in the early morning. Its food consists chiefly of fruit

and seeds, but it will to some extent accommodate itself as regards food to the produce of the locality in which it happens to be located. It is rather a lively bird, and sometimes suspends itself below the fruit on which it is feeding, and makes its repast while hanging in that position. Mr. Layard designates the note of this bird as of three syllables, *poo-poo-poop*, resembling those of the copper-smith of India.

Tinker-Barbets. There are thirteen of these tiny birds (*Barbatula*), the largest of which is only 6 inches in length, while the majority of the species scarcely exceed 3 inches. They are all inhabitants of tropical Africa, occurring everywhere from Senegambia and Abyssinia south to the Cape Colony. Of the little tinker-barbet of Natal (*B. pusilla*) Mr. Ayres writes that "the note of this curious little bird so much resembles the tapping of a hammer on an anvil (having that peculiar metallic ring) that it is called in Natal the tinker-bird. It is silent during the winter months, commencing its monotonous cry in the spring, and continuing it throughout the summer. The colour of the tinker-birds is black, streaked or spotted with yellow; the forehead being red or yellow. In some of them there is a white or yellow eyebrow, and a band of red or yellow across the rump.

Brown Barbet. Like the preceding, this barbet (*Calorhamphus hayi*) is a member of the smooth-billed section of the family. It ranges from Southern Tenasserim through the Malay Peninsula to Sumatra, and is remarkable for its sombre plumage, being dark brown, washed with olive-yellow on the upper-parts and yellowish white below, with the throat tinted with red. The bill is black in the male, and reddish or ochre-brown in the female. The length of the bird is about $6\frac{1}{2}$ inches. In Borneo a second species occurs, with a brighter and more brick-red throat (*C. fuliginosus*).

Great Barbets. This genus (*Megalama*) contains only two species, which are the largest of the whole family, measuring over a foot in length; one (*M. marshallorum*) inhabiting the Himalaya, while the other (*M. virens*) extends from Burma to Southern China. The colour is green, with a brownish mantle, and the hind-neck streaked with yellow; the head is blue, as is also the under surface, except on the sides of the body, which are green, and the fore-neck, which is dark brown marked with greenish blue; the bill is pale yellow. The Himalayan species is a well-known feature of the hill-country, where its curious wailing cry is often heard, especially in all the warmer and well-wooded valleys. According to Mr. Thompson, the hillmen have a story that a person who suffered unjustly from lawsuits, and who died in consequence, was changed into this bird, whose cry is, *un-nee ow, un-nee ow*, meaning, "Injustice, injustice." This species and its Burmese ally both appear to make their own nest-holes, which they drill into a tree like a woodpecker; many of the barbets laying their eggs in holes on the under side of a branch. All the larger green barbets of the genera *Cyanops* and *Chotorhea* also hollow out their own nest-holes, and Colonel Legge says that, in the case of the Ceylonese barbet the same nest-hole is not used twice; "but, having found a tree with wood suited to its work, it perforates it each year for the new nest, as many as eight or ten holes being sometimes visible in a tree by a jungle roadside. It is only when sounding wood before making its nest that these birds

tap with their bills, the blows being very slowly repeated, with perhaps an interval of ten seconds between each." Colonel Legge also states that there are generally a few bents and grass-stalks collected for the eggs to lie on, but they are scarcely worthy of the name of nest. Mr. Hume once discovered in the nest-hole made by a blue-faced barbet a large pad consisting almost exclusively of coarse vegetable fibre, apparently strips of the bark of some herbaceous plant, but a few pieces of grass, a piece of red wool, and one or two other similar miscellaneous scraps intermingled in the pad.

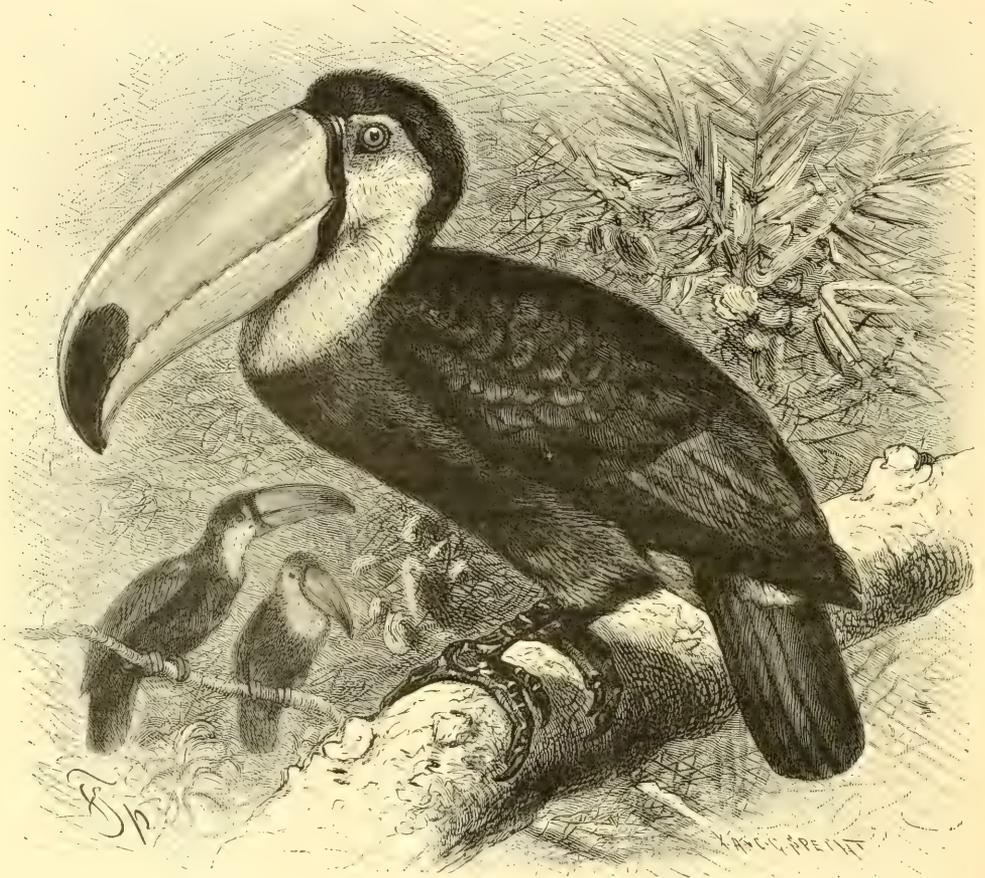
Crimson-Headed Barbet. Like the African barbets, which are called tinker-birds, the crimson-headed barbet (*Xantholama hamatocephala*) gets its name of coppersmith from its metallic note, which much resembles the clinking of metal when struck by a hammer; this note being heard at all times of the day, and given out with monotonous regularity. The writer heard one of these birds at Ajmir, and on creeping up beneath the tree in which it was sitting, found it perched cross-wise on a branch, like a Passerine, and uttering its note at regular intervals, accompanying each utterance with a jerk of the head, first to the right and then to the left. The coppersmith is one of the smaller barbets, measuring about half a foot in length. It is green in colour above, pale yellow below, with green streaks on the flanks. The head is variegated in colour, the forehead being scarlet, with a black band across the crown extending to the sides of the face, which are ornamented with a yellow streak above and below the eye. The throat is bright yellow, with a scarlet band across the fore-neck. The nesting-hole is generally fixed upon by this species in the under side of a hollow bough, and sometimes the eggs are placed at a distance of four or five feet from the original entrance. Jerdon narrates an instance where a pair of these little birds had thus perforated a beam in his vinery, and when they had lengthened the cavity year by year to about five feet they made a second entrance, also from below, about two and a half feet from the nest. This practice of making additional holes for entrance and exit near the nest seems to be adopted by the birds in a wild state also.

THE TOUCANS.

Family RHAMPHASTIDÆ.

Gaudy in plumage, and ungainly in appearance, these large-billed birds are denizens of the tropical forests of Central and South America, also extending to those of Northern Mexico, almost within sight of the Rio Grande. Resembling the woodpeckers and barbets in the internal structure of their zygodactyle feet, they differ in having the front end of the vomer truncated in the Passerine manner. For the size of its owner the bill among the toucans is of enormous dimensions, giving to these birds an almost ludicrous look. If solid, the appendage would be far too heavy to carry; but in reality it is extremely light, being very thin, and the interior occupied by a fine network of bony fibres, arranged so as to give great strength to the external parietes, without weight. The tongue of these birds is likewise peculiar, the anterior portion consisting of a bony, narrow, thin plate, flattened horizontally, and supported by a process of the tongue-

bone, which forms a ridge beneath it. Measuring nearly 6 inches in length in the larger species, at about 4 inches from its extremity it is obliquely notched on both sides: these notches becoming deeper and deeper towards the apex, thus giving it a bristly appearance. Resembling the barbets in having a tufted oil-gland, the toucans also agree with these birds in the presence of ten feathers to the tail. The beak is generally highly coloured; while frequently the bare face partakes of the same brilliant hues. When asleep, toucans have a curious way of



THE TOCO TOUCAN ($\frac{1}{2}$ nat. size).

carrying the tail, which is turned up over the back, while the enormous beak is buried beneath the scapular feathers. According to Dr. Selater's arrangement, toucans may be divided into five genera; namely, *Rhamphastus* with fourteen, *Andigena* with six, *Pteroglossus* with eighteen, *Selenidera* with seven, and *Aulacorhamphus* with fourteen species; the number of toucans now known thus being fifty-nine. According to the account of Prince Maximilian, "these birds are very common in all parts of the extensive forests of the Brazils, and are killed in great numbers at the cooler portion of the year, for the purposes of the table. To the stranger they are of even greater interest than

to the natives, from their remarkable form, and from the rich and strongly-contrasted style of their colouring, their black and green bodies being adorned with markings of the most brilliant hues—red, orange, blue, and white; the naked parts of the body being dyed with brilliant colours; the legs blue or green; the irides blue, yellow, etc.; and the large bill of a different colour in every species, and in many instances very gaily marked. In their habits the toucans offer



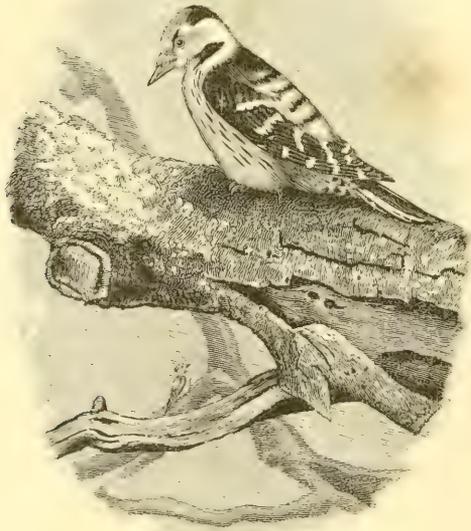
BLACK-THROATED ARACARI TOUCAN ($\frac{2}{3}$ nat. size).

some resemblance to the crows, and especially to the magpies: like them they are very troublesome to the birds of prey, particularly to the owls, whom 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 strongly-developed bills, contrary to expectation, being no encumbrance to them. The voice of the toucans is short and unmelodious, and somewhat different in every species."

Toco Toucan. The general colour of this bird (*Rhamphastus toco*) is black, with a broad white band across the rump; the under surface of the body is also black, with the vent crimson; the throat is white, fading into yellow on the neck, and followed by a crimson band on the fore-neck. The length is nearly 2 feet, and the bill is nearly $6\frac{1}{2}$ inches long. It has a very wide distribution in South America, being found from Guiana to the Lower Amazon, and extending through Brazil and Bolivia to Argentina. Mr. White met with it near Oran, frequenting the high forest trees in large flocks.

Aracari Toucans. Of the smaller-billed toucans, some of the best known are the so-called aracaris (*Pteroglossus*); and an incident recorded by Mr. Stolzmann, during his travels in Peru, shows how difficult these birds are to see in their forest surroundings, his experience being very similar to that of Bates with the curl-crested toucan (*P. beauharnasi*) on the Amazon. Stolzmann says that when procuring a pair of the yellow-billed aracari (*P. flavirostris*), or yurimaguas, he fired in a high tree at a bird, which uttered some piercing cries as it fell, and in a moment he was surrounded by ten of the birds, keeping up a fearful din. On a second shot being fired, they all disappeared. This circumstance proves, as he says, that although only one individual can be seen, it does not follow that there are no more in the neighbourhood, as they are, in fact, always in little troops, according to the general habit of toucans in Peru.

R. BOWDLER SHARPE.



LESSER SPOTTED WOODPECKER.

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