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BIRDS OF AN INDIAN GARDEN

BY

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PUBLISHERS' NOTE

ALL the coloured plates, except three, and most of the text of these articles originally appeared in the *Agricultural Journal of India* during the years 1919–1924 under the title of "SOME COMMON INDIAN BIRDS".

It has been found necessary to alter this title to "BIRDS OF AN INDIAN GARDEN" to avoid confusion with works of similar titles by other authors.

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In this edition the second joint author is responsible for the revision, additional letterpress and coloured plates.

PREFACE

THIS series of papers dealing with some of the more common of our Indian Birds first appeared in the *Agricultural Journal of India* during the years 1919–1924 and had its inception in the desire to help the recognition of the more important birds, from the agricultural view-point, by the issue of a series of coloured plates. There was considerable difficulty in getting this done as work of this nature requires an artist who is also an ornithologist; otherwise, the work produced is likely to be untrue to nature. This combination of qualities was unattainable for some time and the scheme had perforce to be laid aside for some years until Mr. C. M. Inglis, a well-known worker on Indian Ornithology for many years past, visited Pusa and showed me some of his sketches of birds and insects. These indicated that Mr. Inglis was in a position to provide us with the coloured plates required and, on proposing this to him, he readily fell in with the idea. The main share of such popularity as these papers have achieved during their progress in the *Agricultural Journal of India* has been due, I am sure, to the excellent series of plates printed from Mr. Inglis' original paintings. My share has been to provide some appropriate letterpress and, in this reissue of the papers, to provide the uncoloured illustrations, most of which have been prepared by my artists directly from specimens or have been copied from original photographs or, in a few cases, from previous books on Indian Birds.

In the original issue we were forced to publish the articles without any regard to systematic order but just as the plates

happened to be completed and in explanation of this I wrote at the time:

"The haphazard manner in which we are dealing with our common birds may appear to demand some sort of apology, but the apparent lack of arrangement is simply due to nothing but the relative rate at which it is possible to give suitable illustrations of the various birds dealt with. Generally speaking, it is necessary to paint the plate of each feathered friend or foe, with its natural leafy or other background, including in many cases its nest and eggs, at a particular time of the year, and it may chance for various reasons that it is not possible to secure a life-like portrait of any particular bird in its natural haunts in time to enable a plate to be painted just when it is required". The observant will doubtless see more in this than meets the casual eye.

In issuing the second edition, however, the opportunity has been taken to rearrange the papers and to amend the nomenclature in accordance with Mr. Stuart-Baker's second edition of Birds in the *Fauna of British India* series.

Although numerous illustrations, coloured and otherwise, of Indian Birds have appeared from time to time in many books and articles, both scientific and popular, such illustrations have been almost wholly devoted to figuring new and rare species, in the case of the more purely ornithological works, or species of particular groups, such as Mr. Stuart-Baker's excellent series of coloured plates illustrating the Indian Ducks and Pigeons, or, in the case of professedly popular publications which have included figures of the commoner birds, such illustrations have often been rather crude and unsatisfactory—often, indeed, barely recognizable. The present publication will therefore, I hope, fill a gap by enabling the non-ornithological reader, who knows little or nothing about Indian

Birds, to recognize and hence to take an interest in those commoner species which are to be met with in practically all parts of the country. There must be many in India, both Indians and Europeans, residents and visitors, who derive deep, albeit simple, joy from watching the habits of the wild bird-life which can be seen at any season of the year in every compound in the country, but who have often felt themselves debarred from such pleasures by their want of knowledge of the birds concerned—their names and what is already known about them. For such readers, in particular, this little book is intended. In Western countries, where every kind of bird is well known and where cheap and well-illustrated books on birds are readily obtainable, observers of wild bird-life are numbered by the hundred and an immense mass of information has been accumulated on the occurrence and habits of all the native birds. In India, however, except for the very small number who may be dubbed ornithologists, such observers are themselves *rarœ aves;* yet India offers an immense field for observation of this sort. I do not refer to the mere collecting of skins and nests and eggs; nor must the epithet "mere" be taken to imply disparagement of scientific advance in these directions. But there is no locality in India in which very useful observations cannot be made on even our commonest kinds of birds. Take the following points for instance. Many of our birds are local migrants: on what dates in each locality do they appear and leave again? In what nests do the local Cuckoos deposit their eggs and how do they accomplish this? What is the normal food of our common birds and what natural causes keep them in check? Such questions, and many others, can only be answered by local observers, not in one place or in one year, but in many localities throughout the country. All accurate observations, then, on bird-life will be valuable in proportion to their number, provided of course that they are accessible. This implies publication for which there is no lack of facilities in India: it is only necessary to quote, as one example, the *Journal*

of the Bombay Natural History Society. Every number of this Journal contains articles and short notes on the occurrence and habits of Indian Birds and everyone in India who is interested in bird-life is strongly recommended to join the Society and to read the Journal and contribute their own notes to it.

There is an old English saw anent the difficulty of getting a quart into a pint pot and the same principle necessarily applies to a book of this nature. About two hundred species of Indian Birds might be described as of common occurrence in the Plains of India and of these a large proportion may be seen, at one time or another, in an average Indian Garden : it was out of the question to include all of these and therefore only " some " of the common birds could be selected for inclusion. It is hoped, however, that this selection will serve as an introduction to the study of Indian Birds. To those desiring a concise handbook to the commoner species I would recommend Mr. Dewar's " Indian Birds : a key to the common birds of the Plains of India " and for those whose keenness leads them still further there are the eight volumes on Birds in the *Fauna of British India* series, of which a revised edition is now complete.

PUSA:
March 1924.

T. BAINBRIGGE FLETCHER.

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THE JUNGLE-CROW

(*Corvus macrorhynchos*)

THE "country cousin" of the House-Crow is the Jungle-Crow which, although it seems to prefer a *mofussil* life, is often seen, like human country-folk, in large towns to which it comes on a shorter or longer visit or in which it is frequently a permanent dweller. The House-Crow and the Jungle-Crow are the only two crows found commonly distributed in the Plains of India and are easily distinguishable, the House-Crow being a smaller bird with a grey neck, the Jungle-Crow being larger, with a heavier bill and black neck. There are three forms of Raven which may be distinguished by their much larger size. The Punjab Raven is common in the Punjab and North-West Frontier Province and found in Sind, the United Provinces, Bombay and straggles rarely as far as Central India. The Brown-necked species is found in Sind and Baluchistan and the Tibetan one, the largest of the three, only occurs in high regions in Kashmir, Sikkim, etc. The Eastern Carrion-Crow has intensely black plumage, occurs in Kashmir and Tibet and descends as low as Bannu in the North-West Frontier in winter. The Eastern Rook, which is also somewhat like the Jungle-Crow but has a more slender bill, the base of which is bare of feathers in adult birds, and the lower plumage intensely glossed with blue and purple, is found along the North-West Frontier and often does considerable good by feeding on grasshoppers and other insects on cultivated land. The Eastern Hooded Crow, which has the back of the neck and lower plumage, except central part of the breast, drab-grey, is only found, commonly, as a winter

resident to the extreme North-West of India; whilst the Eastern Jackdaw, which looks more like the House-Crow but has the chin and throat grey like the breast, is found in the winter as far South as Ferozepur and as far East as Ambala.

The Jungle-Crow is found throughout the Plains of India, and has been divided into forms, distinguished by length of wing and bill, the medium-sized form being the subject of our Plate, whilst in Southern India and Ceylon it is replaced by the Southern Jungle-Crow (*Corvus macrorhynchos culminatus*) with much shorter wing and smaller, slenderer bill; in the Himalaya it is replaced by the Himalayan Jungle-Crow (*Corvus macrorhynchos intermedius*), a larger race with the bases of the feathers in adult birds pale or pure white, and in the Andamans there is found the Andaman Jungle-Crow (*Corvus macrorhynchos andamanensis*) which is also a larger race with a longer and stouter bill. It will be seen, therefore, that, like its grey-necked relation, the Jungle-Crow affords an example of species in the making, its representatives in various geographical areas (the Himalaya, the North Indian Plains, South India and Ceylon, Andamans, Java) having acquired in each area a characteristic facies without having as yet overpassed the rather vague limits which bound the sum-total of characters constituting a species. Although this bird is not a regular migrant and seems to keep to restricted areas in its wilder haunts, yet the races which have taken to scavenging cities and villages for food probably travel over very wide areas in the non-breeding season, and the result of this habit is that the limits of the geographical areas tend to overlap.

Except for its preference for a country life, in habits the Jungle-Crow is much like the House-Crow. Not being such a confirmed parasite of man, however, it is not so bold as its grey-necked relative. The Himalayan Jungle-Crow is, however, beginning to change its

habits in part of its habitat. Whereas it is usually found far away from human habitations, even in the wilds of Sikkim at 13,000 ft., yet in Darjeeling it is a common bird right in the station. But it is the Northern Indian Jungle-Crow, in particular, that is changing its habits from a wild to a semi-domesticated life, it is usually found within easy distance of human habitations, even, sometimes, breeding in our compounds, where an easier living is obtainable, either by open scavenging or by following agricultural operations such as ploughing or irrigating. When such are going on, this crow soon discovers the fact and congregates, with many other birds, following the plough and picking up insects exposed by the turning of the soil, and also feeding on insects driven out by irrigation water. This crow also attends cattle, picking ticks off the animals and also feeding on dung-beetles attracted to their excrement. Other animal food taken under non-scavenging conditions includes caterpillars, beetles, grasshoppers, etc., centipedes, worms, frogs and lizards. The Jungle-Crow is very fond of frogs and lizards and, like the House-Crow, apparently often worries them to death and then does not eat them. Young chickens, pigeons and even kids are sometimes treated in the same way. The young and eggs of other birds are always eaten, if opportunity occurs, and this propensity is so well known that, should it venture into or near the tree containing their nests, this crow is vehemently hustled away by such birds as Drongos and Black-headed Orioles. Carcasses of animals are fed on and a corpse floating down a river is usually attended by some of these black ghouls. Vegetable food, however, seems to be taken far in excess of animal and many crops are attacked to a destructive extent. Maize, especially in the case of early crops or under garden cultivation, suffers considerably and in Madras this crow also damages ripening paddy. It is also fond of ground-nuts and, in many districts where this crop is grown, coolies with slings have to be employed as bird-scarers. When in season, the

Jungle-Crow is also very partial to the flowers of the silk-cotton tree (*Bombax malabaricum*), to all kinds of fig fruit, and to mulberries. Mr. Mason states that the stomachs, which he examined, almost invariably contained vegetable matter much in excess of any other food material. From an agricultural view-point this crow may probably be classed as of neutral or faintly beneficial value, the damage done to crops by pulling up germinating seeds and eating of ripening grain and fruits being compensated, or perhaps slightly more than compensated, by the good done by its feeding on injurious insects. In sufficiently insanitary localities this crow does a little good by scavenging, but is more of a nuisance around houses by its thievish habits. Like most of its tribe, the Jungle-Crow is fond of carrying off any bright article sufficiently small for it to manage and silverware especially is greatly appreciated, the disappearance of small spoons, etc., being often attributable to crows. On one occasion, when I was at Coimbatore, a crow was seen to carry off a teaspoon from the verandah of a bungalow and fly with it on to the roof; a search on the roof revealed not only the missing spoon, but three others which had been misappropriated in the same way. It is hard to say wherein lies the attraction for glittering objects of this kind, which are of no use for purposes of interior economy, but it is certainly a very real one, and little seems to come amiss, even pieces of ice being carried off at times. Sometimes the object taken is simply carried off and dropped, sometimes it is promptly buried, in which case it may be dug up again and re-buried and is then apparently forgotten. A golf-ball, especially a new one, is often an irresistible attraction, being carried off and eventually dropped at a distance; presumably it is mistaken for an egg. Dewar, however, relates how he once scored off a crow by dropping an "approach shot" on to its back as it was swaggering about in the neighbourhood of the "green". He also tells a story of a rook which attempted to hatch out a golf-ball in mistake for an egg.

The Jungle-Crow seems to be much less clannish than his grey-necked relation, which is kept in its proper place when the two species enter into competition for food. It is also less gregarious and in the *mofussil* each pair has often its own particular area from which it excludes all other crows. The breeding season is very variable according to locality, usually from January to April, earlier in the South and later in the North. The nest, which is placed in a high tree, is a well-made cup of small, flexible twigs, compactly intermixed with leaves or softer material, and lined with grass or hair. The usual number of eggs is three to five, rarely more, the egg being about 40 by 29 mm., and spotted, as shown in our Plate, with dull red or brown on a ground-colour of bluish-green. An interesting point about the eggs of the different races of the Jungle-Crow is that they are very distinctive, more so possibly than the birds themselves. Like the House-Crow, this species is also parasitized by the Koel and by the Muscid fly, *Passeromyia heterochæta.*

In Indian folk-lore the crow often acts as a messenger and is supposed to announce approaching visitors. Crows are also often fed as a propitiation to spirits and, when a child is sick, crows and other birds may be bought by its mother and female relatives and released as a propitiation. The crow is generally regarded as a type of knavery and inferiority—in short, as a wicked rascal. The local vernacular name for this crow in North Bihar is *Kag,* that for the House-Crow being *Kowa.*

The Jungle-Crow must not be confused with its near relative, the House-Crow, " of whom next ", as the genealogists have it.

THE INDIAN HOUSE-CROW

(*Corvus splendens*)

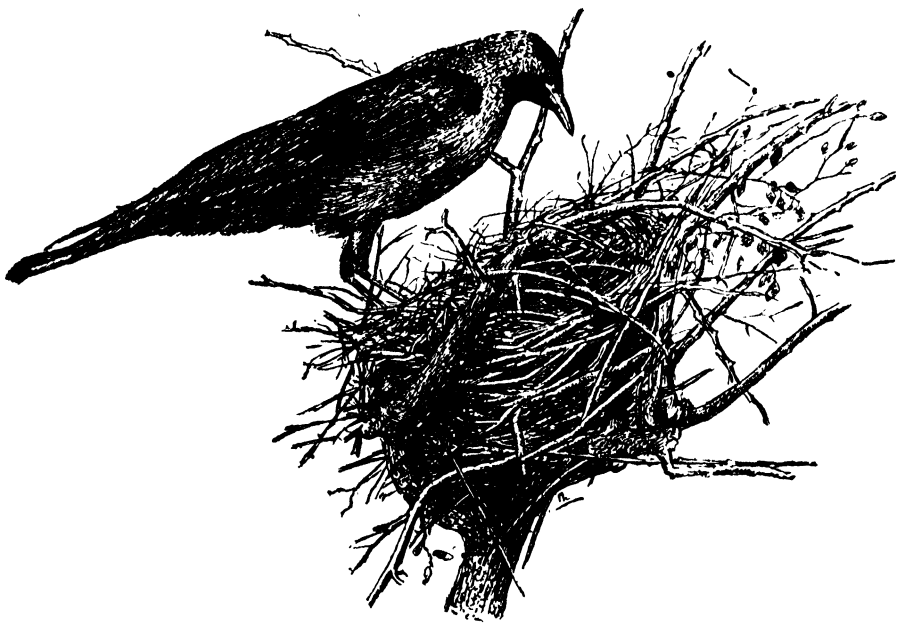
OF the Myna, the subject of a later paper, it has been said that it needs little introduction, but the subject of our present paper needs none at all, as it positively thrusts itself into notice and, especially in towns, is the most familiar (in the literal sense of this word) of all Indian wild birds. From early dawn to dewy eve the House-Crow is with us, resting somewhere handy to swoop down on any edible morsel and making day hideous with its raucous voice as it relates its misdeeds, which are as black as itself. One feels tempted to stop here and leave our Plate to speak for itself. Is not the House-Crow at hand to speak for himself? *Si exemplum requiris, circumspice.* And has he not been treated of at considerable length by many able writers on Indian birds—Lockwood Kipling, Finn, Cunningham, Aitken, Dewar, Stuart-Baker and others? Dewar has even devoted a whole volume to "The Indian Crow: his Book", which is a signal mark of esteem, as few wild Indian animals have been so honoured—indeed, I can only think at the moment of two others, the tiger, on whose life-story Eardley Wilmot wrote a book, and the Sperm-Whale, whose doings are chronicled in Melville's *Moby Dick* and Bullen's *Cruise of the Cachalot.* It seems therefore rather a work of supererogation to add to the literature on this bird, nor is it possible to compress into a short article the mass of material available.

The House-Crow needs little description, being deep glossy-black except for the nape, ear-coverts, the whole head, upper back and breast, which are light ashy-brown. The black portions of the

plumage are highly resplendent, when seen at a proper angle, with purple-blue and greenish reflections, whence apparently the specific name *splendens*. The contrast between the paler and darker portions of the plumage varies considerably according to locality and this crow has been divided into sub-species on this character, the Sind House-Crow (*Corvus splendens zugmayeri*), found in the extreme North-West of India, having the paler parts almost white in sharp contrast to the black, the Burmese House-Crow (*Corvus splendens insolens*) found in Southern Burma, having the dark parts shading into the lighter, which are ill-defined and of a blackish-grey, and the Ceylon House-Crow (*Corvus splendens protegatus*), confined to Ceylon, having the light parts shading into the darker but easy to define, whilst the typical race (*Corvus splendens splendens*), shown on our Plate and found throughout the remaining portions of the Indian Empire, has the difference between the grey and black portions of the plumage well defined. These races, however, tend to run into one another so that individuals from the South of Travancore, for example, are much darker than Northern Indian birds and show a distinct approach to the sub-species found in Ceylon.

The House-Crow has little use for a rural life and is scarcely ever seen in the jungle, but any collection of human habitations is sure to have its quota of corvine vagabonds, and, the larger the town, the greater the number of crows. Dewar states that "probably over a million crows dwell in Calcutta" and such a number certainly does not seem exaggerated. About twelve years ago a terrific hailstorm in Calcutta killed them off in tens of thousands so that the *maidan* was littered with crow corpses, but nowadays the Calcutta crow population seems to be larger than ever. Probably much the same might be said of all large Indian towns. As Aitken puts it, "The crow is a fungus of city life, a corollary to man and sin. It flourishes in the atmosphere of great municipalities, and is not

wanting in the odorous precincts of the obscure village innocent of all conservancy". Kodaikanal is the only town known to me where crows are not. In large towns, where natural enemies are few and food plentiful, the crow has an easy life, increases in numbers and waxes impudent, but in the *mofussil* he has a rather harder time and wears a more subdued look. At Pusa, for example, there are always a few of these crows hanging around the bungalow, but



House-Crow.

they hardly ever make a nuisance of themselves as they do in towns.

The House-Crow makes an easy living by its almost omnivorous habits. In the neighbourhood of houses, it is essentially a garbage-eater and a picker-up of unconsidered trifles in the way of scraps of human food, cooked or uncooked, and preferably acquired by theft. For the crow is not only an outcast scavenger but a thief, delighting

to steal from man or dog or other animal or even from its own fellows. Grain, whether in bags in a railway truck or exposed for sale in a shop or in the field, is always an attraction for crows. Fruits, especially figs and mulberries, are eaten greedily and the young and eggs of other birds form especial delicacies, varied by an occasional debauch on carrion. With regard to insect food, crows do not seem to have such a varied diet as one would expect and insects are usually only eaten in any numbers when they occur in swarms ; on such occasions, termites, locusts and caterpillars may be eaten to a considerable extent. So that when they eat injurious insects, it is only at a time when the damage caused by these insects has been done and when their destruction even on a large scale makes comparatively little difference to their numbers. Under such conditions an attack on insects by birds is to all intents and purposes useless and of very small value as compared with the good done by an habitually insectivorous bird which feeds on insects throughout the year and which is therefore constantly acting as a check on the increase to undue proportions of its insect prey. A crow only helps to lessen to a small extent the undue proportion of any one species of insect when he notices that they are in swarms and he feels inclined to eat or worry them. For this reason, it is impossible to regard the crow as beneficial from an agricultural view, especially in view of the damage done to grain and fruits. At the best, this bird can only be reckoned as of neutral value. In towns, where the conditions are sufficiently insanitary, it may be considered of some slight value as a scavenger, but even against this must be set the annoyance caused by its thievish propensities and noisy habits.

The crow, however, has his good points. His intelligence is distinctly above the bird average and, even when he is making himself a nuisance around houses, a great deal of harmless amusement can often be obtained by watching his wily ways.

To vary the poet slightly, very brief observation of his doings soon shows :—

> "That for ways that are dark,
> And for tricks that are vain,
> The House-Crow is highly peculiar,
> Which the same I am free to maintain."

A liking for mischief for its own sake seems part of a crow's nature and this may be expressed by pulling up garden plants or digging up newly sown seeds, or even by picking off flowers, or carrying off brightly-coloured objects, or very frequently by taking a delight in worrying other birds and animals for no apparent reason whatever. Robbery is usually at the bottom of this, as when crows worry such animals as kites or dogs, but pure mischief often seems concerned rather than a desire for food. An owl abroad in the daytime is always fair game for crows and a snake which ventures into the open is also often mobbed by crows and other birds such as Drongos and Mynas. Lizards, such as *Calotes*, are often worried by crows and in his *Tribes on my Frontier* Aitken gives an amusing account of an occurrence of this nature, but a lizard or frog may sometimes be worried to death and then left uneaten, showing that the attack on it is not prompted by hunger. The crow's intelligence is also shown by the occasional holding of *panchayats*, when all the crows of the neighbourhood gather together and vociferously discuss some point of common interest, sometimes apparently the uncorvine conduct of one individual crow who is thereafter set upon by the rest and pecked to death or outcasted. Usually a crow which is damaged in any way is worried to death by its fellows. Yet the crow will certainly rescue a friend in distress if he can and will not hesitate to show his indignation against the cause of suffering to his own comrades. The crow is also a good husband and a tender parent, devoted to his repulsive nestlings, in whose defence he will not hesitate to attack even man at times.

The House-Crow nests at the beginning of the hot weather. In Calcutta building commences about February, but in some parts

of Bengal it may even commence in December. The breeding season varies considerably according to locality. Generally speaking, March to May are the favourite months, later in the North and earlier in the South. The nest is a large and untidy mass of sticks, lined with smaller twigs or grass or almost any other softer material, and placed in the fork of a branch of any convenient tree near human habitations. If available, curious materials may sometimes be used for building. Several cases have been recorded in which crows' nests have been built of short lengths of wire from soda-water bottles or even wire as thick as a slate-pencil and in Bombay one pair of crows constructed a nest of gold and silver spectacle frames of an estimated value of four hundred rupees. Another nest in Madras was made of bits of tin snippings taken from the Tin Bazaar. Both the parent birds collect the material for the nest but its actual construction is apparently the sole duty of the female, the male transferring to his partner, for fixing in the nest, the material which he brings in in his beak. The twigs used may be collected off the ground, or, if not thus available, be broken off growing branches. When building is going on, the male bird accompanies the female everywhere and will not let her go out of his sight. The labour of collecting and building is varied by brief intervals of connubial affection which takes the form of head tickling, but this is not allowed to delay the completion of the nest, which is usually finished in about two days. Thereafter the hen lays in it four or five (sometimes two or three or six, or rarely seven) eggs, which measure about 37 by 27 mm. and vary greatly in colour, the ground being any shade of blue-green, blotched with dull reddish and brown, with small secondary markings of grey or neutral tint, irregular in shape and scattered profusely over the whole surface of the egg.

At this stage, the crow is often parasitized by the Koel (*Eudynamis scolopaceus scolopaceus*), the male of which is a black bird

with a very long tail, whilst the female Koel is glossy black-brown, spotted and barred with white. Both combine to achieve their end of depositing an egg in the crows' nest, and they do this in a very interesting way. Crows seem to hate the sight of the Koel, which takes advantage of this fact. The male Koel flies up to the crows' nest and attracts the crows to chase him away, a pursuit in which he is quite safe as he is faster on the wing, the Koel taking care to lead the crows after him as far as possible. Meanwhile, as soon as the coast is clear, the female Koel slips into the deserted nest and deposits an egg, after which she flies off again with a triumphant cry of "*Kuil, Kuil, Kuil*", as a signal that the deed has been done, whereupon the male Koel shakes off his pursuers and leaves them to return to their nest. Whether the female Koel destroys any of the crows' eggs before depositing her own is not certain but this is probably the case. In any case, the crows do not detect the difference, as they seem to be incapable of counting. Whether the female Koel actually lays the egg in the nest is also uncertain, but it is more probable that she lays it elsewhere and then transports it in her mouth until she obtains access to the nest.

Apparently the crows are so pleased with themselves at the successful hatching of the eggs that they are indifferent to the nature of their strange nestlings. At any rate, they appear to be fond of their foster-children. Aitken relates that on one occasion he saw "a pair of crows feeding a clamorous young Koel, together with its foster-brother, their own child. It was hungry and clamorous too, but the Koel appeared to be the favourite with the parents". The newly-hatched crow nestling is such an abominably ugly little brute that perhaps it is excusable to suppose that even its own parents may prefer a young Koel. Be this as it may, they certainly watch over their young with assiduous care and the nest is never left unguarded for a moment, each parent taking its turn to go out and forage.

As Dewar puts it :—" The reason for its devotion is not far to seek. It is the penalty of wickedness. It is a case of thieves knowing the ways of thieves. Crows are notorious robbers of nests ; neither eggs nor young birds come amiss to them. They know the evil that is in the corvine heart ; hence the careful guarding of the young ". But even the watchfulness of the parent birds is unavailing to keep away the fly (*Passeromyia heterochæta*) which commonly lays its eggs in crows' nests and whose grubs suck the blood of the young nestlings.

The House-Crow needs no protection but is quite capable of looking after itself. Hence it receives no benefit in any Province under the Wild Birds' Protection Act, and in most large towns in India it will doubtless be considered that his numbers might be reduced with advantage. Yet other countries have endeavoured at times to acquire him by compulsory immigration. Thus, Finn states that " he has of late years been introduced as a scavenger into Zanzibar ", and in December 1902 a consignment of House-Crows was sent from Ceylon* to the Malay Peninsula to help in reducing an outbreak of caterpillars on Coffee in the Straits.

The habits of this bird would fill a book and we have only space to refer to its gregarious habit of roosting by night in favourite trees during the non-breeding season. Sometimes, the trees selected as a dormitory serve the same purpose during the daytime for flying foxes. Thus, on the west coast of Ceylon, about thirty-five miles South of Colombo, lies the small island of Barberyn, covered with coco palms, whose tops provide a resting place for these large bats in the daytime and for crows at night, and in the early morning and evening may be seen the passage across the strait dividing the island from the mainland of immense flocks of crows and flying foxes, the one starting out to forage and the other intent on rest.

* See *Spolia Zeylanica*, Vol. I, pp. 23–33, Fig. 13 (1904).

THE TREE-PIE

(*Dendrocitta rufa*)

THE true Crows, as anyone may observe, have tails which are much shorter than their wings, but many members of the great Crow family have tails much longer than their wings, and this latter group includes the Magpies and Tree-Pies, of which a dozen species of the latter occur within our limits, mostly in the Hill Districts of Northern India. We confine ourselves to those birds with brown crowns and rufous abdomens. The Tree-Pie, however, is rather a bird of the Plains, where it is sufficiently common to be a familiar object in most large gardens, although its curiously metallic cry, rather like the loud squeak from a rusty gate-hinge, if one may imagine a mellifluous squeak, is usually more evident than the appearance of the bird itself. Its most usual call is a sound which may be written *kok-li, kok-li*, but it has a great variety of notes, many of them charmingly melodious in character, others merely hoarse chattering volleys of sound. So far as appearance goes, the Tree-Pie can hardly be mistaken for any other bird found commonly in the Plains, being about eighteen inches long, of which two-thirds is tail, the bill black, the head, neck and breast sooty-brown, the body chestnut-reddish, with some silver-grey on the wings, and the long tail greyish, darkest at the base and broadly tipped with black. During flight the tail is spread out and, as the tail-feathers are unequal in length, the middle feathers being the longest and the others decreasing in length to the outer pair, which are only about half the length of the middle ones, the expanded tail gives this bird a curious appearance when on the wing. Like many other birds, the Tree-Pie has split up into several local races,

of which five have been given subspecific names. Of these, however, three, distinguished by the blending of the colours of the head and back, are confined to Burma and need not be more than alluded to here. The Indian forms, in which the colours of the head and back contrast strongly, are the Indian Tree-Pie (*Dendrocitta rufa rufa*) which is lighter both above and below and not nearly so richly coloured as the Bengal Tree-Pie (*Dendrocitta rufa vagabunda*) which is darker and more richly coloured both above and below. The former race is found throughout West Southern India, Central India and North of the Godaveri and South of Bihar. South of the Godaveri, in the Nilgiris and South Mysore another form *Dendrocitta rufa vernayi* occurs and is recognized by its *very* pale colour and smaller size, and in Sind, Rajputana, the Punjab, the North-West Frontier and North-West Himalayas the North-Western Tree-Pie (*Dendrocitta rufa pallida*) is found; this is paler and larger than the Indian Tree-Pie. The habits vary little, the last two seem to reach higher elevations, *vernayi* being said to be common up to 5,000 feet and *pallida* is common round Mussoorie and other hill stations of those regions up to 7,000 feet. The Bengal race occurs from Nepal to Eastern Assam, throughout the United Provinces, Bihar, Bengal and Manipur and is the form figured in our Plate.

The Tree-Pie is a bold and intelligent bird, which goes about in pairs or in small parties, flying from one tree to another and continually prying about for insect or vegetable food. In the early morning especially it is often seen in trees on the hunt for insect food; it is a good climber and supports itself with its claws and tail, rather like a Wood-pecker, on vertical or even overhanging stems and branches whilst it searches the crevices of the bark for small insects. Some of its food is obtained on the ground, but most in trees and bushes, and a very small proportion on the wing. The late C. W. Mason stated that " this bird is to a very large extent

a vegetable feeder, though it does not apparently damage crops or planted seeds. It takes a variety of weed seeds and fruits of all kinds including all the common species of *Ficus*, *ber* fruit (*Zizyphus jujuba*), mulberries, *Sissu* seeds, etc. Of cultivated fruits, when they are in season, it takes peaches, loquats, plantains, etc., and besides eating the fruit on the trees it will often knock off a considerable amount more. Not only does it thus damage the fruit, but it also breaks off small branches (which often contain fruit buds) of brittle-wooded varieties of trees when it alights on them, and is therefore not to be desired in a carefully kept orchard. Leaves and buds of various sorts are also eaten, but apparently only of wild plants. The Tree-Pie's insect food is very varied, but undoubtedly some preference is shown to caterpillars, principally Geometrids and some other smooth varieties—I have never known it touch a hairy one—to beetles, which are mostly Tenebrionids, and to a less extent to the common wasp, *Polistes hebræus* . . . . . It does not as a general rule take crickets ". It is fond of silk-worm caterpillars and, when it can obtain access to these, may be a nuisance to silk-worm rearers. The food, however, is very varied and one's impression is that it is more largely of an animal nature than Mr. Mason's records indicate. Lizards and spiders are greatly relished and a Tree-Pie will often make a regular practice of hunting around the verandah of a bungalow in the early morning to snap up any lizards or spiders which may be recovering from a surfeit on the insects attracted to the lights the night before. Mr. D'Abreu examined at Nagpur a bird whose stomach contained a mouse, a Buprestid beetle, a caterpillar and two Pentatomid bugs, and at Pusa I have seen one carrying a very fair-sized snake which I managed to make the bird drop and found it to be a *Rhabdophis stolatus*, upwards of two feet long; the snake when rescued was alive and active but bore marks of the bird's mandibles and would undoubtedly have been eaten. The Tree-Pie is also a confirmed robber of the nests of other birds, especially of doves, stealing and

devouring the eggs and young of all the smaller birds. Like many other birds, the Tree-Pie has his good and bad points, but on the whole it is apparently beneficial.

The breeding season is from February to July, from February to March in the South and from May to July in the North, but is not well defined, and eggs may be found both later and earlier than the period normal to any particular locality. When nest-building commences, the parent birds are unusually noisy and the presence of a very voluble pair of birds at this time of year is generally a sure sign that they are beginning to build, and the site of the nest can be located by watching the birds which also resent the presence of other birds on or near the tree which they have selected for themselves. The nest is usually placed well up in a large tree but may at times be built in a thorn hedge, thorny bush or in a Cactus clump. A tree with thick foliage is a favourite site, the nest being well concealed as a rule and never obtrusive to the eye. The nest is a not very large but rather untidy mass of twigs, roots and miscellaneous material, carelessly interwoven and lined with roots or at times with softer material; it is usually about seven inches across, the egg cavity being about five inches in diameter and usually shallow but at times three or four inches in depth. Three to five eggs are laid as a rule, most often four, rarely six, but in the South only two or three, and the eggs, which average about 29×22 millimetres, belong to two types, one pale greenish blotched and spotted with fuscous, the other pale reddish-white or salmon colour with blotches of reddish and dark-brown and other underlying blotches of lilac and neutral tint; the former type is the commoner in North Bihar. The same peculiarity of producing more than one type of egg is found in other birds but its cause is not very evident: it has been suggested that such variation may be due to the age of the bird, but this hardly appears to be a likely explanation, as in North Bihar, as noted above, the greenish type is the commoner,

whilst in the United Provinces the salmon-coloured type preponderates. Both parents assist in nest-building and in feeding the young and both are also said to take part in incubating the eggs. The young birds are fed almost entirely on caterpillars and perhaps also on fruit to some extent.

The Tree-Pie has not been given legal protection in any part of India. Apparently it is considered well able to look after itself. Being conspicuous, it rejoices in various names in different parts of the country; Stuart-Baker states that the Bengal race is called Bobalink by Europeans, but this name belongs rightly to an American bird and I have never heard it used in India, although it is to some extent descriptive of the Tree-Pie's note; in North Bihar the local vernacular name is *kokaya*, in Bengal it is also called *kotri*, *takka-chor* and *handi-chacha*, in North Cachar *kash-kurshi*, in Assam *khola-khoa*, in Hindi-speaking areas *maha-lat*, at Lucknow *mutri*, in Sind *mahtab* and *chand*, and in Telugu-speaking districts *gokurayi* and *kond-kati-gada*. It will be noted that many of these vernacular names are also expressive of the various calls uttered by this bird.

THE JUNGLE-BABBLER OR "SEVEN SISTERS"

(*Turdoides terricolor*)

THE subject of our present article rejoices in several names. In the new edition of the *Fauna* volume on Birds it is called the Bengal Jungle-Babbler (*Turdoides terricolor terricolor*) whereas it was referred to in the former edition as the Jungle-Babbler (*Crateropus canorus*), and it is also known as the Bengal Babbler, the Seven Sisters, *Chatarhia* (in Bengal), *Pengya-maina* (in the United Provinces), *Kutch-batchia* (in Bihar), *Pedda-Sida* (in Telugu) and as *Sat Bhai, Jangli-Khyr* and *Ghonghai* in Hindustani-speaking areas. Of these names, the popular names, "Seven Sisters" or *Sat Bhai*, and the scientific name, *Crateropus canorus*, are the best known applied to this bird, which is sufficiently common everywhere to be a familiar object in all shrubberies of compounds in Northern India north of a line drawn roughly from Orissa to Bombay. As its specific name implies, it is an earthy-coloured bird, a very little larger than a Myna with a long tail and a generally untidy look about it, which goes about in small flocks in shrubby places, hopping along over the ground and turning over dead leaves in search of food. In Southern India it is represented by the Southern Jungle-Babbler (*Turdoides terricolor malabaricus*) which differs from the northern bird in being much darker both above and below, most noticeably so on the chin, throat, breast and flanks. The feathers are also darker edged, which shows up more vividly the central pale streaks on the shaft of the feather, these streaks being indistinct in the northern race. In North-Western India there is a third race, the Sind Jungle-Babbler (*T. terricolor*

sindianus), which is paler than the Bengal race, with the upper parts greyer and with the shaft-streaks on the feathers ill-defined or obsolete. There are five other Babblers of the same genus; three of them have the throat and breast dark-brown or black whereas those already mentioned have ashy throats mottled with pale brown and ashy-fulvous breasts. The Ceylon Babbler (*Turdoides striatus striatus*) differs from the next species in having the head the same colour as the back and the streaks on the back not as well defined. It is confined to Ceylon. The White-headed Babbler (*Turdoides striatus polioplocamus*) has head dingy greyish-white and a dark-brown patch, below and behind the eye, contrasting with the rest of the head and there are white and black streaks on the ashy-brown back. It is the common form of the Madras Presidency from North of Ellore, at any rate as far south as Salem. The Bombay Babbler (*Turdoides somervillei*) has a rufous tail and no pale edges to the flight feathers, whereas the last two species have the tail ashy and brown and the flight feathers are pale edged. It is found from Bombay down the coast to the southern part of the Kumta taluka of North Kanara. The next two species are more birds of heavy jungle than more open country. The Ceylonese Babbler (*Turdoides rufescens*) has the whole upper plumage rufous-brown and lower plumage ferruginous. It is only found in the damp districts of Ceylon. The last one, the Ashy-headed Babbler (*Turdoides cinereifrons*), is, as its name shows, ashy on the head; the rest of the upper plumage is reddish-brown, the chin whitish and the remainder of the lower plumage rufous-brown. This bird is also confined to the dense forests of Ceylon. The general appearance and habits of all the three races, however, are pretty much the same and the following remarks may be taken to apply to all of them although our Plate represents the Bengal race.

The "Seven Sisters" is especially fond of gardens, being found wherever cover in the shape of a shrubbery is provided. In

such places an observer will soon come across a small party of rather bedraggled-looking dusty-brown birds, rustling about in long hops amongst the dead leaves and keeping up a ceaseless gabble of conversation as they follow one another about, turning over the fallen leaves and twigs and peering and prying beneath them for insects, snails and worms. Whilst busy among the leaves they always seem to have an air of dread of finding something terrifying concealed under them and are constantly leaping into the air and starting backward, and yet all the time seem to be in the height of spirits. Although the flock often consists of about half-a-dozen individuals, the number is not necessarily seven and may at times exceed twenty, and why they should be known particularly as the *Seven* Sisters is not especially obvious. Seven is of course a sacred number since Babylonian times, signifying especially the seven planets (the five planets then known together with the sun and moon), whence the number of days in our modern week, and the number as applied to these little parties of birds possibly signifies completeness. Be this as it may, the number is not always seven, as Sir Edwin Arnold observed when referring to this bird in his *Light of Asia* :—

" The nine brown sisters chattered in the thorn."

As regards the second part of the name, as Stuart-Baker well puts it, " their sisterhood or brotherhood they show by the manner in which each individual resents any interference from outside to any of the party yet retains full liberty to argue, disagree and fight with any one or all of the other six ". In cases where one member of the party has been seized by a trained hawk, the others have been known to rush to its assistance and even to rescue it from the hawk. The bond of union resulting from their social habits seems so strong that on the escape from the cage of one individual of a party kept in captivity it has been known to do its best to get in again without further thought of escape. With regard to this

trait Finn remarks that "it may be ungenerously suggested that such birds are afraid to go about alone, lest the ribald remarks, made in the security of numbers, meet with a just retaliation at the beaks and claws of outraged bird society; and so it may be, but nevertheless there is a well-spring of sincere sociability under the Babbler's frowsy feathering. On the comparatively rare occasions when my captives were still, they employed themselves in affectionately tickling each other's heads as they cuddled together, and I have even seen one diligently employed in endeavouring to clean the wing of a friend, soiled by the bird lime with which its capture had been effected. At the same time it must be admitted that the addition to their ordinary diet of table scraps of such a delicacy as a cockroach was apt to produce a sad disruption of fraternal harmony. On such occasions one might see one brother prone in the sand while another, holding his head 'in chancery' with one foot, was punching the same with his beak in a manner calculated to awake grave fears for the integrity of the sufferer's skull when the punishment should be over; and once I saw two birds adherent with bill and claw to one and the same cockroach, which a third was devouring, as neither of the joint owners dared let go his hold".

The development of such a degree of clannishness in this bird is doubtless connected with its extremely weak flight. It seems to take to wing comparatively rarely, and when it does, a certain degree of momentum is attained by a violent beating of the wings for a short distance, after which the flight becomes a gliding skim, their pace flagging and their line of flight sinking rapidly. Should a fairly wide open expanse need to be crossed, this can only be done by climbing a tree on one side high enough to allow for the rapid descent that attends their flight, much in the manner of a flying squirrel, which runs up a tree and casts itself off into the air, volplaning downwards on to another tree at a lower level and then running up that and repeating the performance. I have, however, seen this bird rise

from the ground and fly upwards into a tree. When in trees, these birds run along the branches in single file, often hopping over one another as they go, and run up and down the tree-trunks, clinging to the bark with great agility even when the surface is nearly vertical. The prehensile power of their feet is not only of use when climbing but also of assistance in holding food.

The " Seven Sisters ", as would be expected from its terrestrial habits, is rather a mixed feeder, subsisting largely on insects, small lizards, frogs, worms, etc., which it finds amongst and under dead leaves and also on wild fruits which always seem to be picked up off the ground.

The late Mr. C. W. Mason examined the stomachs of thirty-six birds at Pusa and found the contents to consist largely of fig and *ber* fruits mixed with a great variety of insects and weed seeds, with an occasional frog, spider or centipede. The food is obtained in jungly or shrubby places, and cultivated areas or crops seem to be rarely visited and this only when there are large trees or jungle close by. The nestlings are fed principally on caterpillars, with a few beetles and an occasional cricket or grasshopper. From an economic point of view, therefore, this bird may be regarded as beneficial to the farmer.

The generally untidy appearance of this bird seems to extend to its nesting habits, the nest being a loose untidy cup, often composed of aerial roots of fig trees, and placed about twenty feet above the ground in the boughs of small trees or shrubs. At times, the nest may be placed much lower down. The structure of the nest is often so loosely woven that, when the bird is not sitting, the sky can be seen through it from below. The nesting season is any time between March and September but mostly either just before

or just after the break of the South-West Monsoon. The usual number of eggs is four, but as many as seven may be laid, and the egg is of a beautiful blue, intensely glossy, and measures about 25 to 20 millimetres. The Babbler is extensively parasitized by that extremely obnoxious bird the Hawk Cuckoo or Brain-fever Bird (*Hierococcyx varius*) whose eggs are very similar in general appearance, but usually less glossy and more elliptical in shape. It is also parasitized by the Pied-crested Cuckoo (*Clamator jacobinus*), just as often as by the Brain-fever Bird, this Cuckoo also laying an egg very similar in colour to that of the "Seven Sisters". In one nest Mr. Inglis found no less than six eggs of the Pied-crested Cuckoo, along with three eggs of the Babbler, evidently the produce of several individuals of the former species.

The Jungle-Babbler is protected by law throughout the year in Delhi, the United Provinces, Bengal and Assam, and in Madras in the Shevaroy Hills from February to June only.

SOME BULBULS

(*Molpastes sp.*)

WITH regard to their popular names which are so well known and firmly established that it is difficult to dislodge them from general use, many animals have acquired titles which are perhaps more descriptive than correct. Such, for example, are the " white ant ", which is not an ant and not always white, and the " black beetle ", which is not a beetle and not necessarily as black as the popular idea paints it. Many similar instances might be quoted and in this connection it is difficult to resist the temptation to refer to the dictionary which defined a lobster as " a little red fish which swims sideways " ; whereas of course a lobster is not a fish, it is not red until it has been boiled, and it does not swim sideways. Owing to a similar confusion of ideas or terms the Indian Bulbuls have achieved a somewhat spurious reputation as exquisite birds of song. Both in Eastern and in European poetry the bulbul is frequently referred to as a delightful singing bird, and the dweller in India may well wonder why the Indian Bulbul does not live up to its reputation. The fact seems to be that the Indian Bulbul is not the same bird as the bulbul referred to in Persian poetry as the lover of the rose and which is really a nightingale. Our Indian Bulbuls have cheerful notes but they are not exactly nightingales.

Nearly seventy Bulbuls are found within Indian limits, of which eleven belong to the genus *Molpastes*. The first eight of these, however, are now usually placed together as representing a single species, *Molpastes cafer*, divided into several geographical

races, of which *Molpastes cafer cafer* is found in Ceylon, northwards to about Bombay to Nagpur in the centre and the Godaveri on the east. *Molpastes cafer saturatus* from the north of the Godaveri to Manbhum; *Molpastes cafer pallidus* from Ahmednagar and Khandesh through Eastern Sind and Rajputana and Central and Southern Punjab; *Molpastes cafer burmanicus* is found from Manipur to Burma, southwards to Rangoon and eastwards to the Sittoung River; *Molpastes cafer nigripileus* occurs east of the Sittoung River in South Burma to the Malay Peninsula; *Molpastes cafer chrysorrhoides* is found in the Kachin Hills, Shan States, and North-East Tenasserim, extending into China; *Molpastes cafer bengalensis* occurs in the Himalayas, from Nepal eastwards to Eastern Assam, the Eastern United Provinces, Bihar and Eastern Bengal; and *Molpastes cafer intermedius* is the race found in the North-West Frontier, Trans-salt range plateau, Sub-Himalayan ranges to Naini Tal to the Western United Provinces. In some localities these races run into one another and it seems unnecessary to dilate further on the distinctions between them. The bird shown in our Plate, about half as large again as a sparrow, but with a longer tail, a pointed black crest on its head, and a patch of red feathers beneath its tail is sufficiently familiar not to require a long description, and may reasonably be set down as a Red-vented Bulbul in one of its numerous forms. It is merely necessary to point out that in other parts of India the local form of this bird may differ slightly from our Plate in the definition or extension of the black on the crown of the head, in the colour of the ear-coverts, chin, or throat, although it always retains the blood-red patch " in the seat of its trousers ", as the inimitable EHA so well put it. The remaining three birds of this genus have yellow patches in the seats of their trousers and have white patches on the sides of the head. The Himalayan White-cheeked Bulbul (*Molpastes leucogenys leucogenys*) occurs in the Himalayas from Afghanistan right across to the Dihang River in Assam; the Plains White-eared

Bulbul (*Molpastes leucogenys leucotis*) occurs in Sind, Cutch, Guzerat, Rajputana, Punjab, North-West Provinces, south to Central India and east to Jhansi, Saugor and Hoshangabad; Hume's White-eared Bulbul (*Molpastes leucogenys humii*) occurs in a small area round Jhelum, Attock, Bannu and Kohat, on the extreme North-West Frontier. Their habits are the same as those of other Bulbuls.

These birds are more often found in gardens than in the open country and usually occur in pairs, although sometimes parties of half a dozen or more may be seen together. They frequent trees and bushes and are rarely seen on the ground, for progress on which their short legs are not adapted. In the evening they often take up a perch on a twig at the top of a low tree and thence make short upward flights into the air, returning again to the same perch; Cunningham states that such flights " at first suggest the pursuit of some flying insect, but . . . in reality (are) merely the expression of exuberant nervous energy that is worked off by active exercise and the utterance of pleasant little songs ". This may be so at times, but I incline to think that the capture of supper in the shape of some small insect on the wing is usually the object of these short flights, as many small insects are flying at that time and other birds, such as Drongos, may be seen catching them at the same time and in the same way, although it is difficult to see what it actually is that they catch. In one of his poems, Sir Edwin Arnold writes of

" The Bulbul, which did chase the jewelled Butterflies ",

and certainly at times the Red-vented Bulbul may be seen to catch and eat butterflies, principally species of *Catopsilia*, and, although its diet is a varied one, insects form a large proportion of it. The late C. W. Mason investigated the stomach contents of thirty-seven birds at Pusa and found them to contain 129 insects, of which 96 were classed as injurious and 30 as of neutral value. Mr. D'Abreu also at Nagpur found the diet to be a mixture of

vegetable matter and insects and observed these birds feeding on long-horned grasshoppers. The vegetable food eaten is largely composed of wild fig fruits at Pusa but is varied according to what is available locally. It is noteworthy that these birds have been credited by several observers with a distinct preference for fruits of a red colour. Cunningham, for instance, says : " Among the fruits that they have a great liking for are those of various gourds, particularly one with beautiful, bright-red, pulpy fruits " and at Faridpur, in Bengal, this bird has been noted as committing " great havoc in gardens amongst tomatoes and chillies, the red colour of which seems to attract them ". *Lantana* berries form another class of food of which they are exceedingly fond and the bird shown in our Plate is depicted sitting on a *Lantana* bush, and in districts in which *Lantana* occurs as a pestilential weed its spread is helped very considerably by the dispersal of the seeds eaten by Bulbuls. Bulbuls sometimes do some damage by attacking fruits in gardens and orchards, but the good done by destroying insects throughout the whole year must be offset against this.

The nesting season varies considerably according to locality, as might be expected in the case of a bird so widely distributed, but in the Plains it breeds chiefly in May, June and July, although a few eggs may be found earlier or later. In Southern India the period is about three months earlier than in the North. The nest, which is placed in almost any sort of tree or bush, is neatly cup-shaped and usually composed of dry grass stems, very small twigs or stems of small plants, lined internally with fine roots or grass or hairs. Spiders-web is sometimes woven into the outside of the nest. Three eggs are usually laid, but sometimes four are found. The egg varies considerably in size, from about 20 to 27 mm. in length, and from about 15 to 19 mm. in breadth, and is pinkish or reddish-white, blotched, streaked or speckled with various shades of red, brownish or purplish-red.

The Bulbul is comparatively an easy bird to keep in confinement, as its diet is a mixed one. It is often kept as a pet by Indians and it is not unusual to meet a proud owner going for a stroll, carrying a Bulbul on a little crutched stick which, in the case of wealthy people, is sometimes made of jade or one of the precious metals. We regret to add that one of the attractions of the Bulbul as a pet is its ready pugnacity, which is accentuated, when it is desired to make two birds fight, by starving them beforehand and then showing both a morsel of food, whereupon, as a hungry Bulbul will naturally resent competition regarding food-supply, a fight is apt to ensue.

THE RED-WHISKERED BULBUL

(*Otocompsa jocosa*)

THE Red-whiskered Bulbuls are of wide distribution reaching from India to China. Five races are found in India. The Bengal Red-whiskered Bulbul (*Otocompsa jocosa emeria*) has the upper parts rich ruddy brown, an interrupted blackish-brown band across the breast and white tips to the tail feathers; it extends over a large area, over the Himalayas across to Bhutan and Eastern Assam, Bengal, the northern portion of Orissa and the North Chin and Kachin Hills in Burma; the Kumaon race (*Otocompsa jocosa provincialis*), which differs from the Bengal one in the paler coloration of the upper parts, is found in the Valley of Nepal, United Provinces and Bihar; we may here say that we found it very rarely in parts of North Bihar; the Madras race (*Otocompsa jocosa fuscicaudata*) has the upper plumage duller brown and the band across the breast complete or nearly so and also has no white tips to the tail; it occurs over most of Southern India, south of the ranges of the last two races, with the exception of Mount Abu and the neighbouring areas of Rajputana (Ajmere, Nasirabad); the Mount Abu race (*Otocompsa jocosa abuensis*) differs from the previous one in the extreme paleness of its coloration both above and below and the gorget across the breast is, however, pale in colour and interrupted in the centre; it is confined to Mount Abu and the neighbouring areas of Rajputana (Ajmere, Nasirabad); the Burmese race (*Otocompsa jocosa peguensis*) is like the Madras race but has white tips to the tail; it is found over most of Burma and in the Andamans and Nicobars.

The habits of these Bulbuls are very much the same as those of the Red-vented ones and do not vary much between the races, except that, perhaps, the northern races are more plains birds than those found in the South. They are, as Stuart-Baker says, " as much birds of houses and humanity as are their cousins with the red flannel seats to their trousers and are, if anything, even more confiding and even more restricted to the environment of towns, villages and cultivated areas ". They may be commonly seen in scrub jungle in the vicinity of villages and also occur in deep forest. They always appear to be full of the " *joie de vivre* " and are even more sprightly than their cousins the Red-vented Bulbuls, their perky crests and the tufts of crimson below the eyes making them seem more so. In most parts of their habitat they are very common and so confiding that they will enter verandahs. Their flight is quite strong, but slow, and their diet both insectivorous and vegetarian. They often do considerable damage to larger fruit like oranges, etc., when just formed, and also to peas, strawberries, etc., when ripe ; they also eat the berries of *Lantana* and help to propagate that noxious plant.

The breeding season varies between February and August. They breed largely in gardens and near villages and their nests are cup-shaped, sometimes very compact but also at times very loose in structure and formed of grass bents, thin twigs, with leaves, ferns, etc., often incorporated on the outside, the lining being of finer roots and grass. They are usually placed at no height from the ground, sometimes *on* it and are seldom seen higher than 15 feet. Many nests are well concealed but often the Madras race makes no effort of concealment, therefore the eggs and young suffer much from the rapacity of other birds, mammals, snakes, lizards, etc. The usual number of eggs are three or four in the Bengal race and two or three in the others ; they are very similar to those of the Red-vented Bulbuls.

THE MAGPIE-ROBIN OR DAYAL

(*Copsychus saularis*)

PERSISTENT PESSIMISTS are wont to say that in India the most gorgeous flowers have no scent and that the birds have no song, but the Magpie-Robin, with many other birds, gives the lie to the latter part of this assertion, as the cock bird has a fine range of melody which is heard especially in the Spring. This is one of our most familiar birds occurring commonly, but never in large numbers, in every garden and cultivated area throughout the whole of Continental India and Burma and Ceylon, being especially a bird of the Plains, although it ascends the Himalayas to a height of about 6,000 feet. The cock is a perky-looking bird, rather smaller than a Bulbul, glossy black with its lower parts sharply marked off in white, a white bar on the wing and the outer tail-feathers white ; it runs along the ground after insects and has a habit of elevating its tail perpendicularly at the end of its run. The hen bird is marked much like her mate but shows greyish-brown in her plumage where his is black. The sexes pair for life and are commonly found in gardens, their habits being very robin-like. They are rather pugnacious birds, a pair generally keeping the whole of a garden to themselves, and the hens are, as Finn observes, of much more retiring habits than their mates. According to Hodgson, these birds are caged for fighting purposes : " Fighting these tame birds is a favourite amusement with the rich (in Nepal), nor can any race of game cocks combat with more energy and resolution than do these birds ".

The Magpie-Robin feeds on the ground, mostly on insects, its diet being varied by vegetable matter and an occasional earthworm. The late C. W. Mason investigated the stomach contents of twelve birds at Pusa and found them to contain 142 insects, of which 7 were classed as beneficial, 50 as injurious and the remaining 85 as neutral, the insects eaten including grasshoppers, crickets, ants, weevils, and other beetles, a few bees (perhaps not taken alive), wasps and cutworms. The injurious insects taken are of far more economic importance than the beneficial and this bird may certainly



Feathers of Magpie-Robin.

be reckoned as one of the gardener's friends. I have seen one tackle and kill a hawk-moth caterpillar which was almost as bulky as itself.

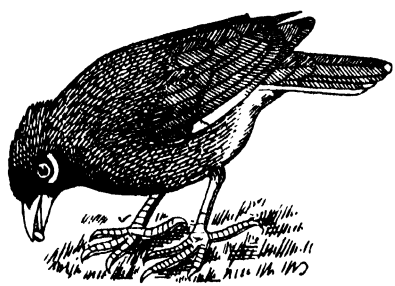
Breeding takes place from March to July, when a rough nest is constructed in any convenient hole in a tree or wall, but egg-laying takes place in the majority of cases during the second half of April and in May. Very occasionally the nest is placed in a bush, but almost invariably it is found in holes in trees, banks or walls or under the eaves of huts and sometimes in verandah roofs. Both

parents assist in building the nest and in incubating the eggs. In the Plains the nest is usually composed of roots, grass, fibres and feathers, but in the Hills moss and lichens are largely used, the nest being saucer-shaped, broad and shallow, four or five inches in diameter with a central depression about an inch in depth ; in any case, it is always put together very loosely and roughly. Five is the usual number of eggs laid, but we have seen as few as only two incubated ones, and the eggs are typically oval, neither very broad nor very narrow, averaging about 22 mm. long by 17 mm. broad, the ground colour varying from greenish, greenish-white, to pale sea-green or delicate pale, only slightly greenish-blue, but they are generally all streakily blotched and mottled with different shades of brownish-red, sometimes thinly and sometimes so extensively as to leave but little of the ground colour visible, and in all cases the markings are most numerous at the larger end of the egg, on which they commonly form a conspicuous irregular mottled cap. We have taken one clutch of a pale greenish-blue without a single mark on any of the eggs. The eggs in the same clutch vary very largely in the markings.

Our Plate gives a good idea of the typical race, the cock bird on the right and the hen on the left, the butterfly represented being *Colias croceus fieldi*, which occurs commonly all along the Himalayas, penetrating into the Plains in the cold weather. The typical race, according to Stuart-Baker, is found over " the whole of India except extreme South-West Travancore, Burma to South Tenasserim, Shan States, Yunnan and China ".

In the south of Burma this bird is represented by a local race (sub-species), the Malay Magpie-Robin (*Copsychus saularis musicus*), found in the extreme south of Peninsular Burma, south of Siam, Malay Peninsula to Java, Sumatra and Borneo, according to Stuart-Baker, in Ceylon and possibly extreme South Travancore by

the Ceylon Magpie-Robin (*C. saularis ceylonensis*), and in the Andaman Islands by the Andaman Magpie-Robin (*C. saularis andamanensis*). They only differ in the amount of black and white on the tail and their habits differ in no way from those of the typical race.



Common Myna.

PARADISE FLY-CATCHERS

THE Paradise Fly-catcher is probably one of the most striking of the birds that occur in India and is easily recognizable, at least in the case of the adult male, by the two extremely long tail-feathers which in some localities have earned their owner the name of Ribbon-bird.

The Fly-catchers form a group of birds feeding mainly on insects which are caught on the wing, the species of this group having very feeble feet, which incapacitates them from walking on the ground, their usual habit being to wait on some convenient branch and swoop down on their insect prey, which is taken in the air. Many other birds, such as the King-crow, also have this habit, so that we must not be taken to mean that every bird seen swooping down on an insect in the air is necessarily a Fly-catcher. This group of birds is characterized by the presence of numerous long hairs stretching from the forehead over the nostrils, these hairs lying horizontally and reaching in all cases beyond the nostrils and sometimes nearly to the end of the bill. Over eighty species and sub-species of Fly-catchers occur within Indian limits and amongst these the genus *Tchitrea* is distinguishable by its crested head in conjunction with a tail as long as, or longer than, the wing. There are two groups of *Tchitrea*, one the *paradisi* one in which the chestnut males have a metallic gloss on the throat contrasting with the breast, and the *affinis* group in which this is uniform grey not sharply contrasting with the breast as in the other group. There are four sub-species in the *paradisi* group, the Indian Paradise Fly-catcher (*Tchitrea paradisi paradisi*) which occurs all over India south of

the Himalayas but not to the east of the Bay of Bengal. This is the species represented in our Plate ; the Himalayan race (*Tchitrea paradisi leucogaster*) is found in the higher hills of the Himalayas, Afghanistan, Baluchistan, Kashmir and as far east as Assam ; it is a paler race than the typical one ; the Nicobar race (*Tchitrea paradisi nicobarica*) only occurs in the Andamans and Nicobars, it differs from the typical race in having a short rounded crest and is a duller bird in the chestnut stage ; the Ceylon race (*Tchitrea paradisi ceylonensis*) is restricted to Ceylon and the extreme south of Travancore ; it differs from the typical race in the much richer colour of the chestnut plumage.

The *affinis* group has been lately revised by Dr. Finn Salomonsen (Ibis, October 1933). He allows three races in India and Burma ; the typical race, which has been considered for so long to be the race found in Assam and Burma, he restricts to the Malay States. *Tchitrea affinis saturatior* in the chestnut form has an olive wash on the upper plumage giving it a brownish appearance and the abdomen is yellowish : it occurs in Sikkim, Bhutan, the Duars and Assam ; *Tchitrea affinis indochinensis* has the upper plumage, in the chestnut form, dark chestnut and the abdomen is pure white, it occurs in Pegu (?) and Tenasserim. Dr. Salomonsen is inclined to think that this race has no white stage ; *Tchitrea affinis burmæ* is intermediate between the two groups, *paradisi* and *affinis ;* the white males are very similar to *leucogaster* and *paradisi* but are smaller and have a much smaller crest ; this race is found in "Central Burma, Northern Lower Burma, Arakan North to Akyab".

The Indian Paradise Fly-catcher occurs throughout the whole of the Indian region from Afghanistan and Kashmir to Ceylon. It is found in most localities in the Plains throughout the year but migrates locally to a large extent, although there seem to be few

exact records on this point ; thus, Oates states that it seems to be everywhere a permanent resident ; Whistler says it is a summer visitor to the North-West Himalayas and Salt Range ; while in most of the Punjab it is a passage migrant from March to September and in Sind it is a scarce winter visitor. More information is required as to the movements of this beautiful bird. In North Bihar, it arrives about the end of March and leaves at the end of October, not being noticed during the cold weather. It is then fairly common, locally, in Bihar but its distribution seems to be rather erratic : for example, I have never seen one at Pusa. In the United Provinces also it is a migrant, as Gill states that during the winter months this attractive bird occurs in most districts and is frequently met with in gardens and groves adjoining human dwellings, but the majority seem to migrate in summer to the Sub-Himalayan tracts, although a great many remain behind and breed sparingly throughout the Plains. So far as our experience goes this Paradise Fly-catcher seems to occur most commonly in Northern India. I have seen it in considerable numbers around the lake at Bhim Tal in Kumaon. In Calcutta it can hardly be called common, but stray specimens may be seen in gardens at all times of the year, and the same remark applies to Southern India.

The Paradise Fly-catcher when young is chestnut in colour, except for a black head and crest and whitish under-parts, and the female retains this coloration throughout her life. The cock bird, however, undergoes a very striking change of appearance, the two median tail-feathers growing to a length of sixteen inches (i.e., four times the length of the other tail-feathers) after the autumn moult of the second year, these long feathers being retained until the following summer, when they are cast. After the third autumn moult, these long feathers grow again and the plumage gradually begins to turn white (with the exception of the feathers of the head and crest, which remain black), the wings and tail being the first

portions to be affected by the change ; the adult male bird is thus partly chestnut and partly white for a time, and it is not until after the moult of the fourth autumn that the plumage of the body and tail becomes wholly white. Thereafter he remains white, with a black head and crest, and the two long white tail-feathers, looking like white ribbons, for the rest of his life, and is a most striking object when seen on the wing. As Cunningham says, " the first sight of one of them, floating softly along and seeming to swim through the air in a series of gentle impulses, gives rise to a very lasting mental impression. As one of the mature male birds flies along through the leafy coverts, in which they are most at home, the snowy whiteness of his long waving train gleams out in the light of the scattered sunbeams that struggle downward through the branches, and produces effects quite unlike those that attend the flight of any other kind of bird . . . . . Even in their first dress, and before they have acquired their wonderful trains, they are strikingly beautiful. They have such full, bright, black eyes, such rich chestnut tints in the wings and tail, contrasting with the shining black of the head and the snowy white of their under-clothing, and their movements are so exceptionally graceful that it is hard to cease from watching them, and when they are in all the glory of full dress, they must be to every one a source of wondering admiration as they leap lightly about from twig to twig and float hither and thither among the branches ".

Oates writes that the notes of the birds of this genus are very harsh, but such a statement seems rather libellous and once again we cannot do better than quote Cunningham, who says that " whilst travelling about over the boughs, they continually utter twittering notes, with occasional louder calls, so like those of the Blue Fly-catcher that, until the birds come into view, it is impossible to make out which species one is listening to. Now and then, too, the male birds break out into sweet little songs. They are very

lively and cheerful birds, always on the move; and the males constantly flirt their great trains about, separating and closing and undulating the long, trailing plumes in a wonderful way". The Indian name of *Shah Bulbul* also presumably indicates that this bird is by no means devoid of song. This bird does, however, at times (generally when on the wing), utter a decidedly harsh note.

All Fly-catchers are insectivorous as a general rule, although some species take fruits, berries and seeds occasionally. The Paradise Fly-catcher feeds on small beetles, flies, bugs, ants and spiders, as recorded by Messrs. Mason and D'Abreu from examination of actual stomach contents. It is, therefore, together with the other species of this group, a useful bird to the agriculturist and its utility and beauty fully deserve the protection accorded to it by the Law in Bengal, Bombay and Burma (but not in other Provinces, apparently). In Mysore also it is presumably protected as being a bird of bright-coloured plumage.

The Paradise Fly-catcher lays its eggs in Ceylon and Travancore in February and March, in Southern India in March and April, and in Northern India in May, June and July. The nest is usually a delicate little cup, never very deep and often quite shallow, composed, according to materials locally available, of moss, moss roots, vegetable fibres and fine grass, this last generally constituting the greater portion of the thin frame-work, which is bound around externally with cobwebs. The egg cavity is from 2 to $2\frac{3}{4}$ inches in diameter and from one to 1·6 inches deep, and is often lined with horse-hair or fine grass. The nest is affixed to the thin branch of a tree, as a rule in a mango tree between seven and thirty (mostly between ten and twenty) feet from the ground. A favourite site for a nest is at the extreme end of a leafy, overhanging branch of a thick-foliaged tree, as in such a position the nest cannot be reached either from above or from below. Sometimes, however, the nest is

placed low down, occasionally on the upper surface of a horizontal bough, in such cases usually at a place where there is given off a slender upward-growing twig which is built into the structure of the nest and thus serves to anchor it in position. Three or (less often) four eggs is the normal number, the egg being a rather long oval, somewhat pointed towards one end, about 20 mm. long by 15 mm. broad, in colour pale pinkish-white to warm salmon-pink, more or less thickly speckled, chiefly at the larger end (where there is a tendency to form an irregular cap) with rather bright, but somewhat brownish-red, spots, amongst which a few tiny, pale, inky-purple blotches sometimes occur. Both the parents share in the duties of incubation of the eggs and feeding of the young, the male in such cases either having or not having attained his wholly white plumage ; if he has done so, he is of course a very conspicuous object when sitting on the nest.

Our Plate gives a good idea of the male in wholly white plumage, as well as of the female and nest.

In the new edition of the *Fauna* volume on Birds, Stuart-Baker writes of the habits of this species as follows :—" There is no more beautiful avian sight in India than a graceful, long-tailed, white, male Paradise Fly-catcher, as it flits backwards and forwards in the deep green shade of the mango orchards it so often haunts. They are tame confiding birds, frequenting gardens, open country and the vicinity of villages but they are also found in forest land, especially deciduous light forests such as sal, etc. They feed entirely on the wing, never descending to the ground and never searching the foliage for insects as some Fly-catchers do. Their ordinary flight is rather slow, the long tail undulating behind as the bird flies, but they are capable of very quick movement when hawking for insects ".

SOME OTHER FLY-CATCHERS

THE Verditer Fly-catchers comprise four races which are divided into two groups, one with no white on the base of the tail and the other in which the base of the tail is white; there is only one species in the latter group, the Nilgiri Verditer Fly-catcher. The bill of this genus, viewed from above, forms an equilateral triangle.

The Common Verditer Fly-catcher (*Eumyias thalassina thalassina*), up to recently known to us scientifically as *Stoparola melanops*, is a bird which ranges over a very large area of country, comprising the whole of India north of Mysore, Travancore and Madras, but absent in Sind and most of the Punjab, and found in Burma as far south as Tenasserim. In South India it is very rare and only a winter visitor, as it is to all the areas in the Plains in which it occurs. This is the bird represented on the right hand side of our Plate; the Malay race (*Eumyias thalassina thalassoides*) extends from the south of Tenasserim to the Malay States; it differs from the typical race in having a well-defined black line on the forehead and a black spot on the chin; the Ceylon race (*Eumyias ceylonensis*) is confined to Ceylon and differs from the last two in having the patch of feathers under the tail almost white instead of blue or green edged with white; the Nilgiri race (*Eumyias albicaudata*) occurs in the hills of Southern India and may be easily recognized by the base of the tail being white.

The Common and the Nilgiri Verditer Fly-catchers are birds which, at once, strike all visitors to our Hill stations both on

account of their beautiful colour and because of their tameness in entering our gardens and even often selecting our houses in which to breed ; they appear to have no fear of mankind. They are also birds of the jungle but prefer the more open spaces near roads and paths, etc., though often returning to heavy forest to breed. They like exposed positions on which to perch ; we have often noticed the common race perching on telegraph wires. As with other Fly-catchers, they capture a good deal of their insect prey on the wing sallying forth from their perch to do so, but as Mr. Whistler so truly writes " while other species often return to the same perch with the captured insect, the Verditer Fly-catcher continues its flight and perches in a new place, thus continually changing its ground and bringing itself more to notice " ; but they also search trees and shrubs for their food. They are usually seen in pairs but, at times, in small parties and Mr. Stuart-Baker has often seen several pairs, hunting amicably for insects, in the flowering shrubs in his garden in Shillong. They have a sweet note and their flight is strong. The Common Verditer Fly-catcher descends to the foothills and plains in the winter. We have seen them in North Bihar about the middle of November and Dr. Law says they reach Calcutta a month later, but they are back again in the hills in early March.

They breed from early April right through to August, many having two or even three broods. They make their nests very frequently under overhanging banks alongside forest roads and paths, in holes in trees or rocks, in crevices between the stones in revetment walls and under the eaves or in the rafters of houses ; an unusual site is mentioned by Hume where he found one resting on the fork of the branch of a tree. The nests are always very alike, only differing according to the situations in which they are placed ; they are cups composed of green moss mixed with roots and lined with fine roots. A nest taken by Dr. Law in Darjeeling

from beneath the beam in a Sanatorium was a heap of moss 2 inches high mixed with roots and a few creeper stems ; it was upon this that the real nest was built—" a cup-shaped superstructure one inch high built entirely of fine black roots ". The usual number of eggs is four but sometimes three and five are laid ; the ground colour is creamy-pink, sometimes almost white, with a ring of reddish blotches round the larger end or faintly speckled all over with the same colour, sometimes these freckles are almost absent. They average 19·3×14·6 mm.

They are said to make charming pets and do well in confinement not being quarrelsome with other birds.

There seems to be little known about the Malayan race of this Fly-catcher. The late Mr. Robinson wrote that it was not very common in Malaya though distributed over the whole country. It keeps mostly to the edges of clearings and roads in forests. It is not, however, as tame and confiding as the Common and Nilgiri races. The Ceylon race is, according to Mr. Wait, " rather a quiet shy bird, seen chiefly on the borders of hill streams in jungle, by woodland paths or on the outskirts of forest. It has a low, clear song. It generally perches on logs, rocks, or on branches fairly close to the ground ". Mr. Stuart-Baker says " It is said to be very bold in the presence of man and to prefer the vicinity of villages and open country to deep forest " but Mr. Wait does not mention this. The Nilgiri race is a very common resident on the Nilgiris, Nelliampathy, Palni and Travancore Hills, usually above 4,000 feet ; according to the late Mr. Kinloch it is the commonest Flycatcher on the Nelliampathy Hills. It does not visit the Plains in the winter.

It is, perhaps, even more familiar than the Common race being extremely tame. Its habits do not appear to differ from those

of the typical race. Captain Bates in his *Bird Life in India* gives a charming account of this bird.

The Niltavas comprise five races, the males of which are very brilliantly coloured. The sexes differ but both may be easily recognized by the brilliant blue patches on each side of the neck. They form two groups— one in which the wing is always 4 inches or longer and the other in which it barely exceeds 3 inches or is less. In the first group there are two races, the Sikkim Large Niltava (*Niltava grandis grandis*) which is found from Nepal to Eastern Assam and Manipur and in the Chin Hills in Burma. The general appearance of the male of this bird is dark purplish-blue with the crown, a patch on each side of the neck, the shoulders of the wing and the rump brilliant cobalt-blue ; the closed tail is purplish-blue but lighter than the back ; the hen is fulvous-brown above, the crown and nape tinged with bluish-ashy, a bright blue patch on each side of the neck and the lower plumage olive-brown ; two females from Muleyit in Burma are, doubtfully, placed by Mr. Stuart-Baker as the Malayan Large Niltava (*Niltava grandis decipiens*) and those are the only records for India and Burma. The male of this race is almost indistinguishable from the typical race but is smaller and the blue of the head rather brighter ; the females differ in having the crown and nape deeply washed with blue. In the second group two species have wings measuring about $3\frac{1}{4}$ inches in length ; they are the Nepal Beautiful Niltava (*Niltava sundara sundara*) occurring in the Outer Himalayas from Nepal and Sikkim to Assam and Manipur ; Lushai, Chin and Kachin Hills to Tenasserim and in winter descending to the foot-hills and plains in their vicinity ; this is the bird depicted at the top of our Plate and no description of the male is necessary ; the hen is olive-brown above with a brilliant patch of blue on each side of the neck, the wings brown edged with rufous, the tail chestnut and lower plumage rich olive-brown with a large patch of white

on the fore-neck ; the Murree Beautiful Niltava (*Niltava sundara fastuosa*) occurs from Murree to Mussoorie and is common between 5,000 and 7,000 feet ; the male differs from the typical race in being less rufous-chestnut below and the female is more olive-grey and paler above and the lower parts greyish-olive instead of olive-brown. The last of the genus has a wing only $2\frac{1}{2}$ inches long ; it is the Small Niltava (*Niltava macgrigoriæ*) and is found from Mussoorie to Eastern Assam, the Chin, Kachin and Bhamo Hills south to Tenasserim. It is very common in the plains adjoining the hills in the winter. The male has the upper plumage bright but deep purplish-blue ; the forehead, sides of crown, a patch on each side of the neck and rump brilliant cobalt-blue ; the lower plumage is deep purple-blue as far as the breast and ashy below ; the female is olive-brown above tinged with rufous, a brilliant blue patch on each side of the neck and ochraceous-ashy below.

The Niltavas are all forest birds, though not always the Nepal Beautiful Niltava which may be seen even on some of the roads of Darjeeling after dusk. They haunt thick damp forest, keeping a good deal to the undergrowth. They all wander down to the foothills and the plains in the winter, especially the Small Niltava. They are all beautiful songsters.

The Sikkim Large Niltava occurs in the hills up to an altitude of 8,000 feet and as low as 2,500 feet. We have only once come across it in the plains of the Duars, this was in February ; it may however be not as rare as that as it is a very sluggish bird sitting quite still for quite long periods and is not readily noticed. Like most of the Niltavas it feeds a good deal on the ground but does not appear to catch its insect prey on the wing at all ; insects form their principal food but Mr. Stevens mentions a purple berry of which they are fond. They like the proximity to water as, indeed, all the Niltavas seem to do and Mr. Stuart-Baker mentions

their building in situations where their nests are more or less constantly wet. He writes, "In Shillong a pair built annually on a ledge of the rock-face of the Elephant falls, the spray from which fell over the nest in a shower whenever the falls were swollen by recent rain. Another pair had their nest in a deep crevice in a rock down which, just behind the nest, ran a constant trickle of water which also, when increased by rain, ran over the edge of the nest". In Assam, the same naturalist says, nearly all their nests are built in holes in large boulders or in the long moss growing on the faces of rocks near streams and waterfalls, the long moss usually concealing the nest. In Darjeeling though these are also built in holes in rocks they are often away from water; another favourite position is in the angle formed by two buttresses of a large tree about 4 or 5 feet from the ground. The nest is composed of green moss lined with fine roots and the breeding season is from the middle of April to the end of June or first half of July; the usual number of eggs is four but sometimes five are laid and occasionally only three; they have a creamy ground colour which is nearly obliterated by pinkish-brown freckles which makes them appear wholly that colour; they average 24·3 × 17·3 mm. About the Malay race the late Mr. Robinson wrote: "It is found in pairs or singly, usually among brushwood, and on the branches of small trees and does not come into the open ground. Quite frequently it descends to the ground, and hops about shady places, sometimes elevating and expanding its tail like a Fantail Fly-catcher. Its food is mixed and fruit certainly enters largely into its diet as has been noted by Jacobson also in Sumatra. On Cameron's Highlands it has been observed eating the raspberries that are abundant in abandoned Sakai clearings, and on the hills above Taiping it has also taken to the fruit of *Lantana* and possibly helps to disperse this noxious introduced weed". Butler states that "it is a good songster but I am not personally acquainted with any note". The nidification of this race is unknown.

The Nepal Beautiful Niltava is a familiar bird round Darjeeling and neighbouring country and in the winter descends to the Plains about December and remains there, at any rate, till about the middle of March. It is not an obtrusive nor a very shy bird and we have often seen it, of an evening about dusk, on the Mall in Darjeeling either on a railing or on the ground, but it soon disappears into the trees or undergrowth. They keep largely to the undergrowth of humid forests but come out on the open roads and paths in the early mornings and evenings when all is quiet. It feeds a lot on the ground but also hunts for insects in bushes. Hodgson says it eats berries and seeds in the winter, but the only berries Mr. Stuart-Baker has known them eat are those which have been infested by insects; in captivity, however, it has been found to have a large appetite for soft fruit; it stands captivity well, even in the English climate, living out of doors all the summer. The breeding season is in May and June, but some breed a little earlier and others a little later; they place their nests very often in holes in trees, below overhanging banks, among the roots of trees or on moss-covered banks and sometimes, like its large cousin, on mossy rocks near water; the nests are very similar to those of that bird only smaller in size and the eggs, usually four, but sometimes three in number, are small replicas of those of the Large Niltava. There seems to be nothing special to remark about the Murree race of this beautiful Fly-catcher but Mr. Stuart-Baker says probably more birds build in banks than in the Nepal race; the nest and eggs are similar to those of that race. The Small Niltava is the pigmy of the genus and has the widest range; it is found in the Himalayas up to 6,000 feet, even up to 8,000 feet in the Naga Hills, and descends to the Plains in December remaining there, at any rate, till the third week in March; it is very common there during these months. Of course all the birds of these species do not descend as low as the Plains; many not descending lower than about 3,000 feet. The Small Niltava frequents the same sort of country as the others

of the genus and often comes into forest glades and other open places; it is the most active of the Niltavas catching most of its prey on the wing but does also sometimes capture it on the ground; insects form their main food but Mr. Cripps found some hard-shelled red berries in the stomachs of some he dissected. Mr. Stuart-Baker writes: "Its sweet little jerky song is often uttered, especially in the mornings and evenings". With regard to their breeding the same author says they like forest without too much undergrowth and prefer the edges of open glades, etc., for breeding purposes; the sites chosen are much the same as that of the other Niltavas and their nests are just like diminutive ones of their larger cousins; the breeding season is May and June and Mr. Stuart-Baker says both parents assist in building the nest, the male confining himself to bringing material; both also take part in incubating the eggs, the period of incubation being either eleven or twelve days. Four eggs are usually laid but sometimes five or only three and they differ considerably from those of the other Niltavas; the ground colour is greyish-yellow or faint creamy-white, most eggs being blotched or freckled all over with dull reddish, the markings often forming a ring or cap at the larger end; other eggs are less well marked and show a lot of the ground colour; they average 18·1 × 13·6 mm.

The Yellow-bellied Fly-catcher (*Chelidorhynx hypoxanthum*) is the sole representative of its genus and is remarkable for its bill which, when viewed from above, forms a perfect equilateral triangle, as in *Eumyias*, only in this genus it is smaller in proportion to the size of the bird. This is, perhaps, the most attractive of our Fly-catchers and is shown on the bottom left-hand corner of our Plate.

It is found from Simla across through Nepal and Sikkim to Assam and the Northern and Central Hills of Burma to Tenasserim.

As the Plate shows the coloration there is no necessity to describe it and we need only remark that the female differs from the male in having the parts round and in front of the eye brown mixed with olive-green instead of black. In the hills they occur, according to Mr. Stuart-Baker, as high as 15,000 feet, but we have never come across them higher than near 12,000 feet; it seldom descends lower than 5,000 feet in summer; but in winter wanders into the plains adjacent to the foothills. We have found it there in December and by the middle of March they are already well up in the hills. They are found in pairs or small parties, often associated with other small birds though, apparently, not always welcome, as Mr. Whistler mentions having seen a party which happened to meet a hunting party of other small birds and the Willow-Warblers "in the latter took exception to their presence and several graceful aerial combats took place". In the migrating season they congregate into larger numbers as is generally the case with most birds. They are birds of deep forest and like the vicinity of running streams but are just as often found on the trees on the sides of roads and paths leading through forests and in the Plains we have also many times seen them in the sparse, river bed forests; they also come into the better-wooded gardens of our Hill stations; we have seen them in such in Darjeeling and Cripps found them in orchards by the roadside and also "about the thorny hedges around the Residency grounds" in Nepal. We cannot do better than quote Mr. Stuart-Baker's account of the habits of this beautiful little Fly-catcher; he writes: "It is an extraordinarily vivacious, cheerful little bird, constantly on the move, sallying into the air in the manner of all fly-catchers, bustling about the branches high up in tall trees, quivering its wings and flirting its widely spread tail. It haunts bushes and lofty trees alike and, though as a rule it is found in deep forest and generally near running streams, I have seen it in reed-beds hunting the reed-stalks for insects and twice I have noticed it in bamboo-jungle. It has a very sweet

but very feeble little song"; this song has been syllabized as *tsip, tsip*. They are not shy birds and may be observed with ease.

The Yellow-bellied Fly-catcher breeds at various elevations from as low as 1,000 feet in the Kumaon Bhaber up to 12,000 feet in Garhwal. We have taken it at Darjeeling between 7,000 and 7,500 feet. May at the lower elevations and June at the higher ones are the breeding months. The nests are beautiful structures, very compactly made with straight sides about $2\frac{1}{2}$ inches high and about the same width with the egg cavity nearly $1\frac{1}{2}$ inches deep and not quite as broad; it is wholly made of moss well matted together and the outside covered with white and brown lichen; all nests appear to be very similar but vary a little in size; they are fixed to the horizontal branches of trees sometimes as low as 5 or 6 feet and sometimes quite high up. Mr. Stuart-Baker mentions one that "was built on the ridge of a great slab of rock jutting out from the bank of a stream" in dense evergreen forest. The normal number of eggs is three but sometimes only two are laid. Mr. Stuart-Baker describes them as "very beautiful, like tiny pink pearls, with a deeper pink flush at the larger end. In reality they have a ground colour varying from almost white to a delicate creamy-pink, marked with a faint ring at the larger end of deeper pink, composed of the most minute stipplings"; they average 14·4 × 11·3 mm.

THE BLACK DRONGO OR KING CROW

(*Dicrurus macrocercus*)

THE Black Drongo or King Crow is one of our most common and familiar birds, occurring especially in all cultivated areas and being fond of perching on any suitable upright twig or other support from which it can swoop down to secure its prey, either on the wing or on the ground. The prey consists almost wholly of insects and practically wholly of injurious insects, so that this bird is most distinctly a valuable ally of the farmer and deserves every encouragement and protection.

The Drongos form a family of birds well defined by their black plumage and long forked tail composed of ten feathers. Nearly thirty forms occur within Indian limits and these are divided into seven genera, which come into two groups according to the relative lengths of the outer tail-feathers. In one group, in which these feathers exceed the middle ones by at least twice the length of the wing, we may briefly notice the Larger Racket-tailed Drongo (*Dissemurus paradiseus*), with seven different races, which occur in practically all the more hilly parts of India, Burma, Ceylon, the Andamans and Nicobars and the adjoining foothills and plains, are black, glossed with blue, with a tuft of feathers on the forehead, and which have a really fine song and are, perhaps, the best singing birds of the East. In the other group, characterized by the outer tail-feathers not exceeding the middle ones by so much as the length of the wing, we have the genus *Dicrurus*, with an untufted forehead and a deep bill, comprising fifteen Indian species and sub-species amongst which *D. macrocercus* with five

races are distinguished by their entire plumage being a deep glossy black and the outermost tail-feather exceeding the middle pair by a distance greater than twice the length of the tarsus. The various sub-species only differ in the matter of size and length of wings and tails. The Indian Black Drongo (*Dicrurus macrocercus peninsularis*) occurring over the whole of India from South Travancore up to the Himalayas excluding the foothills on the west and east and North Bengal; the Himalayan race (*Dicrurus macrocercus albirictus*) is found throughout the Himalayas and foothills, and Assam, Manipur, Chittagong, North Bengal and Northern Burma; the Ceylon race (*Dicrurus macrocercus minor*) is restricted to that country; the Chinese race (*Dicrurus macrocercus cathecus*) occurs in Burma south of the range of *albirictus* as far as Amherst and Mergui; the Malayan race (*Dicrurus macrocercus thai*) is found in the extreme south of Tenasserim. The Black Drongo is the commonest bird seen near dwellings in the Plains and any jet-black bird, about the size of a Bulbul, with a long forked tail, seen in cultivated areas in the Plains, is likely to be this bird. The whole plumage is deep black, everywhere glossed with steel-blue, the latter character being perhaps rather accentuated in our Plate, which shows a small white spot which is sometimes present at the angle of the gape. Young birds have the wings and lower plumage brownish mixed with white, and very old birds may be entirely black.

The specific name *ater*, under which the Black Drongo has hitherto been referred to as a rule in Indian literature, of course means black, in reference to the colour of this bird, but it is a feeble name to have been bestowed on it, and a name such as *audax* would seem better suited to a bird of this character. Its alternative name of King Crow is probably derived from the fierce manner in which it attacks and drives away any crows which approach near its nest during the breeding season. Except for its colour it is not itself

crow-like either in build or disposition. In its nature, indeed, it partakes of a good deal of the piratical, watching from its perch above until some industrious Hoopoe or Myna has found a tasty morsel of insect food and then swooping down and robbing the rightful owner with a dexterity evidently only acquired by a regular course of original sin in the line of highway robbery. The victim, if it be a Myna or similar bird, sometimes shows fight or endeavours to escape with its prize, but the Hoopoe is more of a philosopher and allows itself to be robbed almost with impunity, merely ruffling up its feathers and then starting in again to peck away in the ground in the search for another grub. In any case the result is usually the same, and the Drongo secures the spoil and flies off with it to its perch. This little comedy may be seen enacted daily in almost any Indian garden, especially when the Hoopoe has young and is collecting food to take back to the nest, and it is noticeable that the Drongo only levies just enough toll not to discourage its victims unduly and drive them away altogether.

The Drongo, however, is by no means wholly a parasite, living at other birds' expense, but catches for itself the larger proportion of its food. The late C. W. Mason examined the contents of twenty-seven adult and four young birds at Pusa and Mr. D'Abreu has recorded the contents of seven birds at Nagpur, and these records show that the food consists entirely of animal matter, practically wholly of insects and in an overwhelming proportion of injurious insects, such as crickets, grasshoppers, moths, bugs, and insect larvæ. The prey is captured either on the wing or on the ground, in which case the bird swoops down upon it and either eats it forthwith or flies off with it to its perch. Mr. Mason gives a long and interesting account of the feeding habits (*Ind. Agric. Entl. Mem.*, Vol. III, pp. 69—79 ; Jan. 1912), which we need not reproduce here. The Drongo is one of the birds which accompany cattle, often perching on their backs, but apparently rather for the

sake of the grasshoppers and other insects disturbed by the movements of the animals than for the sake of the flies which annoy them. It is also a regular visitor to ploughing operations, perching on upstanding clods or other convenient vantage spots, and picking up cutworms and other insects exposed by the plough. As Mason notes, however, " he is by no means active on the ground under the best circumstances ", his long tail, which serves so well as an organ of flight, seeming to get in the way when on the ground. It is noticeable that the Drongo never hunts on the ground for insects, but always watches from some convenient perch, swooping down to capture insects seen on the ground. The Drongo is naturally a pugnacious and fearless bird, attacking without hesitation birds much larger than itself. At the breeding season its natural pugnacity is much augmented and it drives away any birds, especially crows, which dare to approach the tree in which its nest is placed. As noted in another place, the Indian Oriole frequently builds in the same tree as the Drongo, the latter thus serving to protect the Oriole's nest as well as its own, and at the moment of writing these lines there is within a few yards of my bungalow a *sissu* tree in which a pair of Drongos and of Indian Orioles have each a nest quite close to one another. A pair of Jungle Crows commenced the nesting season by building in the topmost branches of the same tree, but now they dare not approach it and probably the young Crows have flown by now in any case. Drongos sometimes fight amongst themselves and I have seen a couple so intent on squabbling on the ground that a jackal was able to run up, knock them both down with its forepaws and carry them off.

The nesting season of the Black Drongo is from April to August but May is the usual time in Bihar. The nest, which is a broad shallow cup, is usually placed fairly high up in a tall tree in some fork of a branch not quite on the outside of the tree ; it is composed

of small twigs and stems and roots of grass, neatly and tightly fastened together, and bound around on the outside with more or less cobweb, in which a few feathers are sometimes entangled. The cavity is broad and shallow, about four inches broad by one and a half deep, and lined with horse-hair or fine grass stems or roots; the bottom of the nest is very thin, but the sides are rather thick and firm. Four eggs are the normal number, but there may be three or five at times. The egg is either dull pure white without markings or pure white sparsely spotted with deep blackish-brown, or pure creamy pink blotched with reddish-brown to deep salmon-pink blotched with claret colour; it is noticeable that all the eggs of one clutch nearly always seem to belong to one or other of these types but Mr. C. M. Inglis has found a clutch with two white eggs and one spotted one; the average size of the egg is about 25 mm. long by 19 mm. broad.

The Drongo is protected by law throughout the whole year in Delhi, the United Provinces, Bengal, Assam, and Burma. It is, as already remarked, a most useful bird which deserves every protection and encouragement. The latter aim can be attained, in the case of cultivated areas, by the provision of suitable perches for the birds to rest on.

It is on the wing until well into the dusk and is one of the earliest birds to call in the morning and may at times be heard throughout the night. It has a variety of notes and is an excellent mimic. Donald records that he has heard one imitate a *shikra* (*A. badius*) so as to frighten away a pair of Mynas and thus secure a worm which they had caught.

Mr. C. M. Inglis has seen one chase a Laggar Falcon (*Falco jugger*), but in this case the tables were turned, for the falcon

stopped in its flight and the Drongo shot ahead and was captured by the falcon. The smaller bird in our Plate is shown attacking one of these falcons which had approached its nest, shown on a tree in the background.

Although the Black Drongo is so pugnacious and intelligent, it is sometimes imposed upon by the Drongo Cuckoo (*Surniculus lugubris*), a bird which is itself most remarkably like a Drongo in general appearance and which lays its eggs in Drongo's nests.

THE TAILOR-BIRD

(*Orthotomus sutorius*)

THE Warblers include a very large number of kinds of small birds which, with few exceptions, are plainly coloured and alike in both sexes. Over one hundred and fifty species occur within Indian limits, many being migrants, passing the summer in Central or Northern Asia, whilst others are permanent residents in the Plains and lower ranges of the Hills. Amongst these latter are included the Tailor-birds, so called from the remarkable skill which they display in the construction of their nests which are placed in a receptacle made by sewing together the edges of one or more leaves, and of these little birds the most common and widely-distributed is the Indian Tailor-bird (*Orthotomus sutorius sutorius*). This the typical race is found in Ceylon over most of Southern India up to the North-West Frontier Province and Sind and East as far as Bihar and Western Bengal; the Burmese race (*Orthotomus sutorius patia*), a darker bird, occurs in Nepal, Sikkim, Eastern Bengal and Burma to Tenasserim; the Chinese race (*Orthotomus sutorius longicaudus*), a still darker form, only occurs in India in the Shan States, Burma; the Siam race (*Orthotomus sutorius maculicollis*), which differs from all the others in having the cheeks and a patch on the side of the head marbled brown and white instead of rufescent-white, is only found with us in Tenasserim. The Tailor-bird is a tiny greenish-brown bird, whitish below, in general appearance like a Wren, but with a decidedly longer tail; if further description is needed, it may be noted that the forehead is reddish, shading off into ashy-grey on the back of the head, and that on each side of

the neck there is a short black bar or spot, usually concealed but plainly visible when the bird stretches its neck to utter its note, which it is doing continually. Indeed, as Cunningham has so aptly put it, "whenever memory reverts to the experiences of summer in the Plains of India, it can hardly fail to recall the loud shouts of the Tailor-birds, as they travel about ceaselessly among the shrubs. Even at those times of day when the breathless heat and cruel glare have reduced almost all other birds to relative silence; when even the crows sit about in pairs in the shade, gasping with widely gaping bills and incapable of anything beyond whispered conversation, and when the still and fiery air is only rarely disturbed by the querulous whistle of a kite, even then the Tailor-birds are all alive with noisy excitement. Whilst listening to them, or to the cries or other loud-voiced small birds, one realizes the beauty of the dispensation that has decreed that in the animal kingdom there should be no necessarily direct ratio between size and vocal power; an elephant with a voice on the scale of that of a tailor-bird would have been a nuisance to a whole district! Even the longest use and wont leave it a ceaseless marvel how such pygmies can manage to make such a hubbub, whilst they run and creep about among the bushes, more like little brown mice than any feathered creatures. They have two common calls, the first consisting of an urgent repetition of the syllable 'pēēt', and the second, even more insistent and sounding, 'pe peep, pe peep, pe peep, pe peep'. Long after most other birds are silent; after even the Crows and Mynas have finally settled down for the night, and only an occasional belated Kite is audible, their call may still be heard issuing from the flower-beds and shrubberies, where the birds continue to run mouse-like about in the gathering gloom, jumping after the insects lurking among the leaves. When highly excited over anything they shout their loudest, and, with their tails so excessively elevated that they come to point obliquely forwards over their backs, look more like demented Wrens than

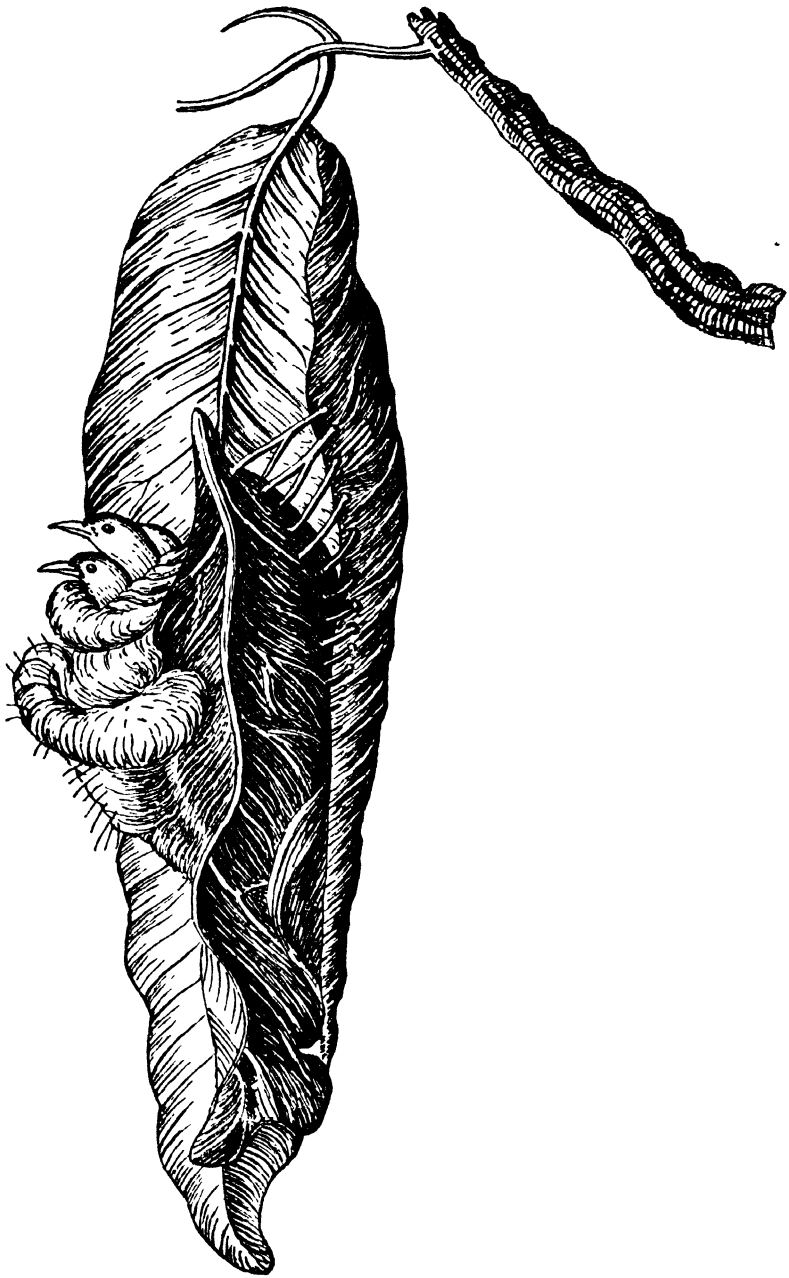
anything else. Whilst engaged in hunting over a shrub they run quickly along the twigs, shouting noisily all the while, and every now and then snatching at insects, and, even when flying, they continue to call aloud with a reckless expenditure of breath". The above has been quoted at length, as it seems to be a charming character sketch of the little bird in question, which, although inconspicuous and apt to be overlooked, will now perhaps be recognizable to our readers. The typical race is shown on our Plate.

The Tailor-birds are, normally, birds of gardens and undergrowth near villages but one race, at any rate, the Burmese Tailor-bird, has taken to a forest life just as much as a semi-domestic one and its loud notes may be heard all over the forests in the Terai and Duars. They are the tamest of birds coming into our verandahs and even making their nests in the leaves of the pot plants. Mr. Stuart-Baker describes its flight very well; he writes: "His flight alone is enough to attract attention, for, when he really launches out for a flight of more than a few feet, he flicks his long tail so energetically and so far over his back that he always looks as if he would knock his own brains out and hurl himself to the ground".

As noted above, Tailor-birds are mainly insectivorous in their diet. The late Mr. C. W. Mason examined the stomach contents of four birds at Pusa and found them to consist entirely of insect remains, mainly of small beetles, bugs, ants and flies; Mr. D'Abreu found much the same in the case of three birds examined at Nagpur. They seem, therefore, to be useful little birds to have in a garden.

The breeding season of the Indian Tailor-bird is mainly in June and July, but nests may be found from March to October and Wait says that in Ceylon "they may be found breeding almost throughout the year, except during long periods of dry weather".

The structure and design of birds' nests in general may vary from just nothing at all, the eggs being laid on the bare ground, to elaborate mounds such as are constructed by the Bower birds, but for ingenuity, as applied to its construction and concealment, the Tailor-bird's nest is hard to beat. Pennant seems to have been the first to give any description of it and we reproduce the rather quaint figure given in his *Indian Zoology* (second edition ; 1790) where he says that in India " the brute creation are more at enmity with one another than in other climates ; and the birds are obliged to exert unusual artifice in placing their little broods out of the reach of an invader. Each aims at the same end, though by different means. Some form their pensile nest in shape of a purse, deep, and open at top ; others with a hole in the side ; and others, still more cautious, with an entrance at the very bottom, forming their lodge near the summit. But the little species we describe, seems to have greater diffidence than any of the others : it will not trust its nest even to the extremity of a slender twig, but makes one more advance to safety by fixing it to the leaf itself. It picks up a dead leaf, and, surprising to relate, sews it to the side of a living one, its slender bill being its needle, and its thread some fine fibres ; the lining, feathers, gossamer, and down. Its eggs are white. The colour of the bird is light-yellow : its length three inches, its weight only three-sixteenths of an ounce, so that the materials of its nest, and its own size, are not likely to draw a habitation that depends on so slight a tenure ". So far as it goes, Pennant's account is fairly accurate except in the statement that the bird picks up a dead leaf and sews it on to the side of a living one. The dry leaves which are often found attached to the outerside of the nest are accounted for by the fact that these leaves, which have originally been pierced by the bird whilst they are still living and attached to the tree or plant, often die and decay *in situ*, either as a direct result of the injury caused to them or by interference with the free access of air to the tissues.



Nest of the Tailor-bird amongst mango leaves [Pennant's *Indian Zoology* (1790), Pl. 10].

The nest may be placed at any elevation, such as high up in a mango-tree or low down in a brinjal-plant but more usually they are built comparatively low down, often within a couple of feet of the ground. The kind of leaf selected seems to be rather immaterial, provided that it is fairly large and sufficiently strong to hold the strain of the stitches, and in gardens the leaves of mango, guava and brinjal are often used. As a rule only one or two leaves are used but occasionally, when the nest is placed on a plant with small leaves, such as oleander, a dozen leaves may be fastened together. Generally, the nests hang down more or less vertically, as shown in Pennant's figure, but sometimes they lie almost horizontally with the opening between the lower edges of the leaves, so that the nest is well protected in rainy weather.

The actual construction of the nest has been observed by Mr. A. G. Pinto, as reported by Dewar in his *Birds of the Plains*. In this case the nest was placed in the leaf of a *Dracœna* plant growing on a verandah and we cannot do better than quote our authority for what took place :—" One of the leaves of the plant was so curved that its terminal half was parallel with the ground. Upon this she commenced operations. The first thing she did was to make with her sharp little beak a number of punctures along each edge of the leaf. In this particular case the punctures took the form of longitudinal slits, owing to the fact that the veins of the *Dracœna* leaf run longitudinally . . . . . Having thus prepared the leaf, she disappeared for a little and returned with a strand of cobweb. One end of this she wound round the narrow part of the leaf that separated one of the punctures from the edge ; having done this, she carried the loose end of the strand across the under surface of the leaf to a puncture on the opposite side, where she attached it to the leaf and thus drew the edges a little way together. She then proceeded to connect most of the other punctures with those opposite to them, so that the leaf took the form of a tunnel

converging to a point. The under surface of the leaf formed the roof and sides of the tunnel or arch. There was no floor to this, since the edges of the leaf did not meet below, the gap between them being bridged by strands of cobweb. This was a full day's work . . . . . She next went on to line with cotton this *cul-de-sac* which she had made in the leaf. She, of course, commenced by filling the tip, and the weight of the lining soon caused the hitherto horizontal leaf to hang downwards, so that it eventually became almost vertical, with the tip pointing towards the ground. When lining the nest the bird made a number of punctures in the leaf, through which she poked the lining with her beak, the object of this being to keep the lining *in situ* . . . . . All this time the edges of the leaf that formed the nest had been held together by the thinnest strands of cobweb, and it is a mystery how these can have stood the strain. However, before the lining was completed, the bird proceeded to strengthen them by connecting the punctures on opposite edges of the leaf with threads of cotton. Her *modus operandi* was to push one end of a thread through a puncture on one edge and the other end through a puncture on the opposite edge of the leaf. The cotton used is soft and frays easily, so that that part of it which is forced through a tiny aperture issues as a fluffy knob, which looks like a knot and is usually taken for such. As a matter of fact, the bird makes no knots ; she merely forces a portion of the cotton strand through a puncture, and the silicon which enters into the composition of the leaf catches the soft, minute strands of cotton and prevents them from slipping . . . . . Sometimes the connecting threads of cotton are sufficiently long to admit of their being passed to and fro, in which case the bird utilizes the full length."

It is only the hen bird which constructs the nest. Although the two sexes are coloured much alike, in the breeding season the male bird acquires very elongated middle tail-feathers,

projecting about two inches beyond the normal length of the tail, so that the sexes are readily distinguishable. We cannot say whether his extra length of tail is an impediment to nest-building or whether it makes him too proud to work or whether he is merely lazy; but to the hen bird must be given all the credit of the wonderful method of nest-building. Aitken, however, in his *Common Birds of Bombay*, implies that it is the cock bird which builds.

The leaves containing and concealing the nest are fastened together with any suitable material that is available such as cobweb, caterpillar silk, thread, wool, or vegetable fibres. When a nest is being built near a house the bird will often make use of threads of cotton or loose strands from a coir mat. Jerdon says, "I have seen a Tailor-bird at Saugor watch till the native tailor had left the verandah where he had been working, fly in, seize some pieces of thread that were lying about, and go off in triumph with them; this was repeated in my presence several days running".

The nest itself is a neat cup, about three inches deep and two inches in diameter, constructed of wool, cotton, with a few hairs and fine vegetable fibres, the cavity being always very softly lined. Three or four (more frequently three) eggs are laid, in Ceylon two are not uncommon and the Burmese race not very uncommonly lays five or six, measuring about 16 mm. by 12 mm., the ground colour being either pinkish-white, clear blue or pale-sea-green, the former being the more common, with the Chinese race blue eggs are commoner, but all the eggs in any one nest always belong to one or the other type; the markings on the eggs consist of blotchings and clouds tending to form a bold irregular cap around the larger end, and also of smaller, brownish-red specks and splashes scattered more or less over the whole surface of the

shell. When sitting on the eggs the hen bird lies very close and does not usually fly out until the nest is actually touched or shaken.

The young birds are well looked after by their parents for some time after they have left the nest and small family parties, consisting of the parents and their young, may often be seen at that time of the year.

THE BLACK-HEADED ORIOLE

(*Oriolus xanthornus*)

ORIOLES, commonly called "Mango birds" in India, are well known to all observers of bird life on account of the conspicuous yellow which is the prevailing hue in ten out of our eleven different forms, the eleventh (*O. trailii trailii*) being black and maroon-red. Of the four species, represented by ten sub-species to which the term Yellow Orioles may be applied, only three are common in the Plains of India and these are the Indian Oriole (*Oriolus oriolus kundoo*) found over the whole continent of India but not further east than Calcutta. In North Bihar it is a seasonal visitor arriving near end of March and leaving in November; and the Indian Black-headed Oriole (*O. xanthornus xanthornus*), found in the Sub-Himalayan ranges from Kangra to Upper Assam and in the Gangetic plain, and *O. xanthornus maderaspatanus*, south of the Gangetic plain but not north and west of Mount Abu and Kathiawar; these last two only differ very slightly in size and amount of yellow on the flight feathers; in all of which species the tail is black and yellow or green but in the Indian Oriole the nape and crown of the head are yellow or greenish-yellow with a small patch of black through the eye, whilst in the latter species these are black, as is the upper breast. Some females are nearly as brightly coloured as the males. They are very similar in their habits, being thoroughly arboreal birds, rarely seen on the ground, and feeding mostly on fruit and such insects as are found on leaves and stems. These Orioles are birds of gardens, groves, etc., and not usually found in forests, but in the Duars the Black-headed Oriole has taken to

a jungle life as well. The form *maderaspatanus* has been found as high as 5,000 feet in the Palnis and *xanthornus* as high as 3,500 feet in the Darjeeling district.

Cunningham, in his book *Some Indian Friends and Acquaintances*, gives a charmingly written account of the Black-headed Oriole in Calcutta, in the course of which he says: "It would be hard to imagine any plumage more beautiful than that of the mature birds with its brilliant contrasts of vivid yellow and shining black and though that of the females and young birds is not so striking, owing to the greenish tone and streakiness of the yellow parts, it has very decided beauties of its own in its delicate gradations and pencillings of colour. They have a truly astonishing variety of notes, almost all of them charmingly melodious in character. As a rule, they go about in pairs, who pass from tree to tree 'crying and calling' to one another at brief intervals. When they are in their very fullest voice the one bird cries, 'Yū, hū a yu', and the other almost immediately replies, 'Tu hū cē'; when very much out of voice they often can do no more than cry 'Tehē' like Alisoun in the *Miller's Tale;* and between these extremes there is a whole range of very distinct calls that only agree in conveying a sense of joy and fulness of life and melodious contentment with it. All of these are highly characteristic and distinct from the notes of any other kinds of birds, save one or two of the most fluty cries of the common tree-pies. It is delightful to see any living things so full of the pure joy of existence as a pair of Orioles always seem to be when they come leaping through the air into a garden, calling as they go; or, after they have alighted in a tree, chasing one another about from bough to bough with their golden plumage shining out among the surrounding green. Now and then a solitary bird will take to haunting a garden for a time, making its appearance regularly day after day at a particular time, in order to visit certain trees and talk softly to itself as it goes on its way; but it is only when in pairs, or in a small

family party of three or four birds, such as may sometimes be seen soon after the nesting season, that they fill the air ' with their sweet jargoning '. The solitary bird occasionally seems to be soured by the want of companionship, and travels round hustling other birds and knocking them off their perches out of gratuitous ill-temper—conduct of which paired birds are never guilty. In addition to the manifold modifications of their regular melodious calls, they sometimes utter harshly cawing notes, and the young birds for a time indulge in churring cries somewhat like those of Starlings."

During the rains, this bird often makes a whistling call which may be written as *Whittu ;* by mimicking this call it may often be induced to reply for quite a long time.

As noted above, the Black-headed Oriole feeds chiefly on fruit and small insects. The late C. W. Mason examined the stomachs of twenty-three birds at Pusa and found that seventeen of these had fed on wild fig fruits and five of these contained nothing else ; the eighteen which had fed on insects contained 95 insects, of which four were classed as beneficial, 73 as injurious and 18 as neutral. Five birds had eaten insects only. In the Central Provinces Mr. E. A. D'Abreu found a Pyralid caterpillar and *Ficus* fruit in the stomach of one bird examined on 24th January, 1914. At Pusa also we have watched this bird feeding on masses of a mealy-bug clustered on the stem of a wild vine growing on a *sissu* tree. So far as agriculture is concerned, therefore, this bird may be considered beneficial. It has not been noted to attack cultivated fruits.

Many authors (e.g., Oates and Dewar) note that this bird is strictly arboreal in habits, never descending to the ground ; but it is occasionally seen on the ground capturing insects.

The nest is a cup-like structure which is usually placed in the fork of a branch and lashed in position by means of fibres which are wound first around a branch, then passed under the nest, and then wound around another bough. In the case of the Indian Oriole (*O. oriolus kundoo*) Dewar (*Birds of the Plains*, pp. 138-139) notes :—

" A very curious thing that I have noticed about the Indian Oriole's nest is that it is always situated either in the same tree as a King-crow's nest or in an adjacent tree. I have seen some thirteen or fourteen Orioles' nests since I first noticed this phenomenon, and have in every case found a King-crow's nest within ten yards. The Drongo builds earlier, for it is usually feeding its young while the Oriole is incubating. It would therefore appear that it is the Oriole which elects to build near the King Crow. I imagine that it does so for the sake of protection ; it must be a great thing for a timid bird to have a vigorous policeman all to itself, a policeman who will not allow a big creature to approach under any pretext whatever." The Black-headed Oriole, however, does not seem to have been noticed to have police protection in this manner.

The breeding season of the Black-headed Oriole is from March to August. Both birds appear to take part in the construction of the nest which is almost always firmly attached to the extreme terminal twigs of an upper horizontal branch of a large tree, some twelve to thirty feet above ground-level. The nest itself is a deep cup, the egg cavity measuring about three inches in diameter and two inches in depth. It is composed chiefly of tow-like vegetable fibres, thin slips of bark and the like, and is lined inside with very fine tamarisk twigs or thin grass, and on the outside it is generally more or less covered over with odds and ends, bits of lichen, thin flakes of bark, etc. Three eggs are laid as a rule, but occasionally there may be two or four. The egg averages about 28·5 mm. long by 18 mm. broad, the shell fine

and moderately glossy, usually creamy or pinky white with sparse spots and streaks of dark brown and pale inky purple.

This Oriole is protected throughout the year in Bombay, the United Provinces, Bihar and Orissa, Bengal, Assam, Burma, Madras and Mysore.

THE COMMON MYNA

(*Acridotheres tristis*)

THE Common Myna needs little introduction as it is of common occurrence in every garden throughout India from the plains up to 8,000 feet in the hills. Why Linnæus should have named this sprightly and vivacious bird *tristis* we could never understand. Certainly no one has ever seen a sad Myna. It may be because of the sober colour of its plumage, but even though sober in colour it is always very sleek and glossy and neat. Of course Linnæus probably never saw one alive and full of the joy of living and was only able to study dull, musty museum specimens and therefore gave it this most inapt name. "Neat but not gaudy" seems to be its motto as it goes through life in its decorous, but by no means dingy, colouring of black, brown and white, finished off with a bright yellow beak and legs and a yellow patch behind the eye. The wings are black, with a white bar which is most conspicuous during flight, when, according to Lockwood Kipling, "a curious effect of rotation" is produced. The head, neck and upper part of the breast are also black, as are the tail-feathers, which have broad white tips also especially conspicuous during flight. The rest of the plumage is brown. Occasionally colour variations occur and albinos are not very rare and Finn records examples with pale cinnamon body plumage; for some time there was an individual in my compound with a bright yellow head—possibly due to moulting. The two sexes are coloured alike but the hen is slightly smaller, the cock bird having a larger head and more massively built body. The Common Myna, as represented on our Plate and found throughout India

and Burma, is the typical form, the Ceylon race (*Acridotheres tristis melanosternus*) representing a sub-species which differs in being darker and in having the outer webs of the earlier primary-coverts black. South Indian examples are darker than those from Northern India.

As is expressed by its generic name, *Acridotheres*, which means a grasshopper-catcher, the Common Myna is mostly a ground-living bird, pacing about in open spaces, and especially over grassy lawns, on the hunt for grasshoppers and other insects. Like the Cattle Egret, it is a constant attendant upon cattle, following the animals and catching the insects disturbed by their movements. For the same reasons, it is greatly interested in cultural operations, such as ploughing or the cutting or irrigation of crops, as such occasions provide a rich harvest of insect prey. The insects eaten by this bird are practically all of injurious kinds—grasshoppers, crickets, caterpillars and beetle grubs for the most part—but the Myna is a very general feeder and spiders and worms are eagerly sought for and devoured, whilst grain and fruits lend variety to its diet. The fruits eaten are mostly wild figs and no great toll is levied on cultivated fruits. Cereals, however, are sometimes attacked to some extent and some little damage is done at times, especially to maize which is preferred whilst the seeds are still soft and unripe. As in the case of many other useful birds, however, it is necessary to take a broad view and not grudge a small toll levied on cultivation in return for the great assistance rendered throughout the year in reducing insect crop pests.

In his *Birds of the Plains*, Dewar calls the Myna "a bird of character", and such undoubtedly it is, standing no nonsense from other birds, whether of its own or of other species. A pair of Mynas, accustomed to quarter a restricted patch of lawn for insect prey, will strongly resent intrusion on their hunting ground by any

other bird and will rigorously put into practice an unwritten notice that " Trespassers will be prosecuted ". As Finn puts it, " Bold, vigorous and pushing, he secures to himself a large share of all good things in the way of insects and fruit that may be going, and is a bird of remarkable all-round abilities, though not particularly graceful in his movements ". Few birds dare stand up to a Myna and there are very few birds that a Myna will hesitate to assault. For this reason, the Myna has not proved an altogether unmixed blessing in those countries to which it has been introduced from India as it is too powerful and too free a breeder to be allowed to increase without checks and thus often renders itself a nuisance by its aggressive habits towards other, not less useful but less pugnacious, birds. It has been introduced from India into Mauritius, Australia, New Zealand, and Hawaii and in the last-mentioned locality has shown itself a decided nuisance by turning out pigeons. In the Andamans also, whither it was introduced in 1873, it seems to be doing its best to oust the pretty little native white Myna (*Sturnia malabarica andamanensis*). It was introduced into Mauritius to destroy grasshoppers and was abundant and perfectly naturalized around Port Louis when I was there in 1905.

In spite of his assertive nature, the Myna is an extremely interesting acquaintance, as his very boldness makes his actions easy of observation whilst his universal occurrence provides endless opportunities of watching his happy habits. Unlike the Crow, with its furtive and self-conscious manner, the Myna makes itself thoroughly at home and at its ease around or even in a human habitation, where its actions seem to be always perky and devoid of any sense of shame. Indeed, as Cunningham aptly says, Mynas " always make themselves entirely at home in a house, taking it completely for granted that they are quite at liberty to drop in and stay whenever and for as long as they like ". Sometimes, indeed, they make themselves rather too much at home, as when they

insist on nesting in some convenient hole in a house and litter the surroundings with a miscellaneous collection of nesting materials. Here again we may quote from Cunningham's excellent account of a pair of Mynas which helped to while away the hours of his first hot weather in Calcutta :—" He and his wife had elected to place their nest on the cornice beneath the beams in one corner of the open roof of my room, and were constantly coming in with fresh stores of building materials. It was quite refreshing to see the supreme satisfaction that they derived from the progress of their work—a satisfaction that every now and then became so acute as to call for a short rest and jubilant little song. Merely to watch the construction of a Myna's nest is a liberal education ; it is like watching the steps in the formation of a local museum. Their taste in materials is so catholic that one never knows what curio may not be brought in. Sticks, straws, feathers, rags, small bones, and pieces of paper are all deemed valuable, and a very special worth would seem to attach to the cast skins of snakes, for, in any case where these are attainable, they are almost sure to be worked into the growing heap of rubbish. The pity is that in their effort to bring in exceptionally bulky materials they are apt to drop them about, and, although snake-skins and feathers may be interesting and even decorative additions to the furniture of a room, great pieces of paper or rag, of unknown origin and very doubtful purity, can hardly be regarded as very desirable additions to one's surroundings."

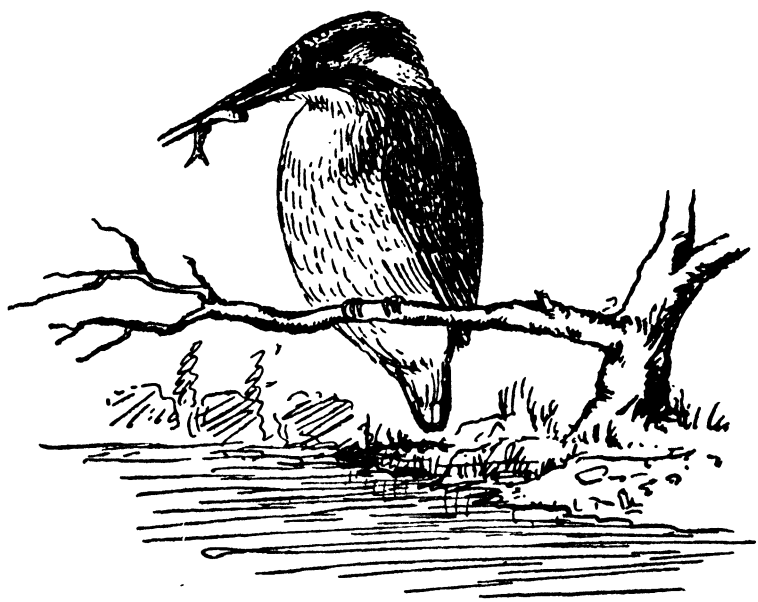
The nest, as may be gathered from the preceding, is an untidy mass of dry grass and miscellaneous rubbish, usually warmly lined with feathers, and placed in a hole, where this is available, either in a tree or in the wall or roof of a house. Sometimes it may be placed in creepers growing on a wall, or on any sheltered ledge, occasionally in palms or other trees. The nesting season lasts from the beginning of the hot weather until well on in the South-West Monsoon. As a rule, four or five eggs are laid and

these are of a glossy bright blue colour, about 30 mm. by 21·5 mm. Mr. C. M. Inglis has on one occasion taken a Koel's egg from a nest of this species which also held three of the Myna's own eggs; this is, of course, exceedingly unusual. The young are fed mostly on an insect diet consisting of caterpillars, beetle grubs, grasshoppers and crickets varied by occasional worms and soft fruits.

Mynas are of course often kept as cage-birds and birds which are reared up from the nest become very tame and fearless. The Common Myna is a good mimic also, although not able to acquire such a wide range of vocabulary as the Grackles or Hill Mynas. Normally, it is rather a noisy bird, its song, to be heard throughout the day, comprising a strange mixture of harsh gurglings and liquid notes. E. H. Aitken described its notes as "*Keeky, keeky, keeky* . . . . . *churr, churr, kok, kok, kok*" and these sounds are fairly descriptive. As it utters the *kok, kok, kok*, it bobs its head in a characteristic manner. When a small flock is feeding on the ground and one bird sees cause for alarm, it takes to wing with a shrill cry of alarm to its fellows. As a rule, such small flocks seem to consist of two or more individuals, generally a cock and hen and their family. Mr. C. M. Inglis has on one occasion seen this Myna feeding the young of the Pied one. During the off-season for nesting, however, they often congregate in large flocks in the evening to roost in company on favourite trees providing dense leafy cover and at such times the deafening din that arises is quite ear-splitting, as every bird seems to have to argue about its proper perch and then to proceed to gossip at the top of its voice about the events of the past day. During February, when the silk cotton (*Bombax malabaricum*) trees are in flower, like flying-foxes and many other birds, they are very fond of the liquor that is to be found in the lower part of the large red flowers, and the competition for this often creates a prodigious fuss almost equal to that at roosting time.

The Common Myna has many vernacular names in India. It is known as *Maina* or *Desi-maina* in Hindi, as *Salik* or *Bhat-salik* in Bengali, as *Bemni* and *Salu* in Chota-Nagpur, as *Salonka* in Mahratti, as *Gorwantera* in Kanarese, as *Goranka* and *Gorinka* in Telugu, and *Zayet* in Burmese, while in the Central Provinces there is a local name *gulgul*, of which *gurral* in the Punjab is apparently another form. In Hindu mythology the Myna is sacred to the God Ram Deo and sits on his hand. In local stories and talk this bird is also a favourite.

The Common Myna is protected by law throughout the year in Bombay, the United Provinces, Delhi and Bengal, and in Burma for trade purposes in reserved forest areas. In Mysore it is presumably protected under the heading, "birds of song, absolutely". On the whole, in India at all events, it seems to be a decidedly useful bird.



Common Kingfisher (*Alcedo iepida*).

THE PIED MYNA

(*Sturnopastor contra*)

ALTHOUGH almost as familiar a bird in North-Eastern India as the Common Myna, the Pied Myna has a much more restricted distribution, being found only east of a line drawn from Ambala to Hyderabad, in the Deccan, and Masulipatam, ranging to the extreme east of Assam and Burma. There are two races with unstreaked foreheads and crowns, the Assam Pied Myna (*Sturnopastor contra contra*) is found from the Duars East to Assam, Eastern Bengal, Chittagong Hill Tracts, Chin Hills and North Arakan. It differs from the one in our Plate by being rather darker above and below ; the Punjab race (*Sturnopastor contra dehræ*) is found east of a line from Ludhiana, Hissar, Hyderabad to Bihar, Western Bengal and Orissa. Where they occur, they are common and conspicuous, both by their strongly contrasting colours of black and white and by the habit of hunting about over grass in the open, often in small flocks, and there is little chance of mistaking any other bird for these. Our Plate gives a good idea of the coloration, so that there is no need to describe this here.

Like its commoner relative, the Pied Myna is a frequent attendant on cattle, picking up the various insects disturbed as the latter graze. It also hunts, almost always in small parties, over any open grassy spaces, catching and eating grasshoppers, crickets, caterpillars, ants and other insects and I have seen one extract and eat a large earthworm. Mr. C. W. Mason examined the stomach contents of fourteen birds at Pusa and found that, of thirty-nine

insects taken, one was beneficial, twenty-five injurious and thirteen of neutral value, and remarks that, on the whole, the Pied Myna is decidedly more vegetarian in its diet than the Common Myna. "When any *Ficus* fruit is ripe or a cereal crop, such as maize, the birds flock to these and at times will be found to feed on little else. They seem even more partial to *Ficus* fruit than the Common Myna. Some considerable damage is done at times to the various common cereal crops—maize, sorghum and paddy especially. Its insect food is much the same as that of the Common Myna, consisting as far as one can see in the field very largely of grasshoppers, small moths, etc." It may, however, be added, in justice to this bird, that nearly all of Mr. Mason's records were obtained in this case between February and June, when relatively little insect food is available; I am inclined to think that a longer series of records, better spread over the year, would show that the Pied Myna is rather more largely insectivorous. Of course, like all similar birds with a mixed diet, it does levy toll on ripe grain, and the conspicuous colours of this bird rather tend to accentuate its presence in grain-fields, but against this must be placed the fact that it is continuously at work throughout the year in reducing the number of insects which, if unchecked, would undoubtedly do far more damage to the crops than is done by the birds. Further, it must be remembered that examination of the birds' stomachs only reveals their contents and does not indicate how the food has been acquired; in many cases, even when these birds are found feeding on cereal crops, the grain eaten is largely picked up off the ground and is almost always intermixed with a considerable proportion of insect food. In the case of one bird examined at Nagpur, Mr. D'Abreu found it to contain four earwigs, two mole-crickets, two caterpillars, a bug, a batch of forty-seven insect eggs, and one red mite—which seems quite a useful effort for one meal; and it must be remembered that such a quantity is probably only a fifth or sixth of the total quantity eaten by one bird in the course of a single day. The occasional

levy of a little grain, when it is abundant and when insect food is scarce, as is usually the case during the harvest season, must not be begrudged to birds, such as Mynas, which on the whole are decidedly beneficial. Mr. Stuart-Baker remarks that "though grasshoppers probably form its staple diet, it devours a good deal of ripe grain.

Cunningham, whose remarks on other birds we have frequently quoted in preceding articles, does not seem very kind to the Pied Myna and writes :—"They are not nearly such attractive birds as the Common Mynas ; for their colouring is coarsely laid on in a way that recalls that of certain of the ornithological inmates of a Noah's ark ; their heads have a debased look, and they have neither the pleasant notes nor the alluringly familiar ways of their relatives. Like the latter, and very often in company with them, they spend their nights, save during the nesting season, in huge mobs, which, if possible, are even more vociferous than those of Mynas. At sundown the din proceeding from such assemblies is often so overpowering as to render even the concerts of the Crows or of the great autumnal crickets temporarily inaudible. Although roosting in and haunting gardens, they never show any desire to enter houses." In Bihar, this bird seems to be locally migratory ; at all events, it seems to occur in large numbers at some times and at other times none are noticed during quite a considerable period.

The breeding season of the Pied Myna is from May to August but most birds lay in June and July. These birds are said, as a rule, not to breed in company, but in North Bihar we found that they usually did so. At the time of writing (4th June) there is a nest in a *Dalbergia* tree alongside my bungalow and this apparently contains young birds, as the parents are bringing in food, principally caterpillars apparently, but they are shy and it is not always easy to see what they do bring. The nest is situated in the fork, near

the extremity of a bough, some twenty feet from the ground, and is a large untidy mass of twigs with a few strips of rags attached to the underside, relatively huge for the size of the bird, being about two feet in diameter, but by no means unduly conspicuous amongst the leafy foliage. This is quite a typical nest, this being built as a rule of straw, grass, twigs, roots and rags, with a deep cavity lined usually with quantities of feathers. Very rarely the nest may be placed in the cavity afforded by a hollow tree-trunk. Five eggs are laid as a rule, sometimes four, and occasionally as many as six. The egg is typically a moderately broad oval, considerably pointed towards one end, but sometimes pear-shaped, pale to sky-blue, sometimes tinged with green, unspotted and brilliantly glossy, in size about 28 mm. long by 20 mm. broad. The young, as in the case of most birds with a mixed diet, are fed wholly on insects which are brought in by the parents.

The Pied Myna is protected under the Wild Birds' Protection Act in the United Provinces, Bengal and Assam. Oates gives the vernacular names under which it is known as *Ablak maina* in Hindi, *Ablaka gosalik* and *Guialeggra* in Bengali, and *Venda gorinka* in Telugu.

A sub-species, occurring in the South of Assam and in Burma, except the Chin Hills and North Arakan, has been separated under the name of the Burmese Pied Myna (*Sturnopastor contra superciliaris*) and another sub-species, which occurs in Siam and just enters our limits in Tenasserim, is the Siamese Pied Myna (*S. contra floweri*). They differ in having the forehead and anterior crown streaked with white and in having a broad white eyebrow; the Siamese is much darker than the Burmese form.

THE WEAVER-BIRD OR BAYA

THE Tailor-bird has already afforded us an example of admirable nest-building and the Weaver-bird has equal claims for admission to our circle of bird friends, which, so far as this series is concerned, must be strictly limited. We may, however, at once note a point of contrast between the two. The Tailor-bird makes every effort to escape its enemies by concealing its nest between leaves sewn together; the Weaver-bird, on the other hand, positively flaunts its nesting arrangements before our eyes and in many parts of India its nests—whole colonies of them, indeed—form conspicuous objects of the countryside; it even builds on trees or palms in our gardens. In some places scores of these nests may be seen, freely exposed to view, hanging from favourite trees, which are usually palms or *babuls* (*Acacia arabica*), trees which overhang water often being selected as it seems to be a *sine qua non* that the situation considered suitable for suspending a Weaver-bird's nest should have no other tree directly underneath it which might afford access to enemies from below. For a nest swinging up aloft on the tip of a long slender palm-shaft is singularly inaccessible to most would-be marauders.

Although the nests are familiar enough, the bird which constructs them is less so. The Weaver-bird is closely allied to the large family of the Finches and at most times of the year looks very like a hen House-sparrow, being a small, thick-billed, reddish-brown bird. Towards the beginning of the rains, however, the cock bird dons his breeding plumage, his head, neck and breast becoming a beautiful golden-yellow and his chin turning almost black.

With the onset of the rains, nest-building commences, either a new nest being built or an old one, of the previous season, patched up and put into good repair. The process of patching up old nests, which are easily distinguishable by the difference in the colour of the grass, and building new ones can often be seen going on in the same tree. The nest itself is strongly woven with strips of leaves of grasses, plantain or palms, strips from leaves of wild species of *Saccharum* being used most commonly. These strips are prepared by the bird itself, which seizes a leaf in its beak and makes a notch at the edge near the base of the leaf; it then grips with its beak the edge of the leaf above the notch and jerks its head away so as to tear off a strip along the edge of the leaf; by flying off with the end of this strip in its beak, the strip is usually pulled off along the length of the leaf; but sometimes, at the first effort, if the leaf is tough, the bird is pulled backwards and hangs suspended by the strip in its beak, so that several attempts have to be made to detach the strip required for nest-building. Sometimes the bird bites a second notch on the edge above the first and at a distance allowing for the length of strip which it considers necessary. The strips thus collected are wound securely around the branch or leaf from which the nest is to be suspended and, as more strips are brought in these are added, securely wound and plaited together, until there is formed a long stalk from which the nest proper is suspended. This stalk is usually about four or five inches long but may occasionally extend to as much as a foot. Having completed the suspensory stalk, the birds then expand its lower end into a bulb-shaped structure, which is usually about five and a half inches in diameter in one direction and four inches in the other. At this time, having determined where the egg-chamber is to be, the birds construct a strong transverse bar or loop, a little to one side of the centre of the chamber, this bar forming a division between the egg-chamber and the long tubular entrance. At this stage of construction the nest resembles an upturned basket, the loop representing the handle.

Up to this point in the construction of the nest, only the cock birds (some of which, being yet in non-breeding plumage, may resemble hens) have done the work of collecting fibre-strips and weaving these into the nest, but, when the egg-chamber has been completed, the female bird takes up her position in it, leaving the cock henceforth to procure more material for building and to work from the outside of the nest, whilst she works from the inside, both of them pushing and drawing in the fibres through the walls of the nest so that everything is plaited together smoothly. The little builders seem to enjoy themselves thoroughly, the cock bird especially being industrious, emitting a cry of delight each time that he brings in a beakful of fibre and often bursting into song during the process of weaving material into the nest. The egg-chamber is now finished on one side of the loop and on the other side the walls of the nest are prolonged downwards into a long tubular entrance, about two inches in diameter internally, and usually about six inches long, but occasionally twice this length. The male bird often continues building on to this tubular entrance even after the eggs have been laid and are being incubated by the female. The lower end of the tubular entrance is loosely woven so as not to afford any firm support to enemies attempting to plunder the nest. The birds themselves when entering the nest close their wings and shoot perpendicularly upwards through the tube ; it is marvellous how they can do this without running their heads through the top of the egg-chamber or even apparently shaking the nest. This tubular passage is used as an entrance to the nest by the parents whilst nest-building and incubation are proceeding ; but, when the eggs have hatched, the food brought to the nestlings is passed in to them through small holes pierced through the sides of the egg-chamber. The presence of such holes is a sure sign that the eggs have hatched.

It will now be apparent what a hard nut has to be cracked by any would-be plunderer of the nest, which is placed high up

out of reach of any non-climbing animals. Even a good climber, such as a squirrel, rat, snake or lizard, will find little to cling to on the tip of a palm-leaf and, arrived there, has to negotiate a distance of at least eighteen inches to reach the entrance to the nest, whilst the lower portion of the entrance-tube is too flimsily constructed to yield any foothold. Plainly visible, its inaccessibility is its sure defence and it can well defy most marauders.

There is still one point to be mentioned about these nests and that concerns the lumps of clay which are stuck on to them in odd places. Jerdon notes that he found in one nest about three ounces of clay in six different places, but this is an abnormal amount, the average quantity not exceeding one ounce, and some nests containing none at all. Many theories have been advanced in explanation, a very popular idea in India being that the bird uses these clay patches as *points d'appui* on which to stick glow-worms to illuminate the interior of its nest. A more probable explanation is that the clay is applied to balance the nest more correctly, to prevent it being blown about by every gust of wind and to keep it steady whilst the birds are entering and leaving it.

Two is the normal number of eggs in Southern India and three or four in Northern India but five are also sometimes laid. As many as ten have been noted, but in cases where there are so many, they are probably the product of more than one bird. The eggs are usually found in July and August. They are, as are all of the Bayas and Weaver-birds, of the genus *Ploceus*, pure white in colour, without any gloss, typically rather long ovals considerably pointed towards the smaller end, and measure about 20 mm. by 15 mm.

A long and interesting account of the nesting habits of the Weaver-bird, by Mr. Salim A. Ali, will be found in the *Bombay*

Natural History Society's Journal, Vol. XXXIV, No. 4, pp. 947–964 (1931).

There are eight species and sub-species of the genus *Ploceus;* four of which are called Bayas and the others Weaver-birds !! Why, we do not know. We would prefer to call them all Weaver-birds. The breeding males all have the crown of the head yellow and two species have the breast yellow. One of these, the Baya (*Ploceus philippinus*), has already been described, it is the one shown in our Plate; it is found over the greater part of India and Ceylon; Finn's Baya (*Ploceus megarhynchus*) may be recognized at all seasons by its larger size and in summer has the chin and throat golden-yellow; it has been obtained in the Kumaon and Duars; the Malay Baya (*Ploceus infortunatus infortunatus*) only occurs with us in Burma from Thaunghoo and Karenni southwards; the Eastern Baya (*Ploceus infortunatus burmanicus*) is found in the Lower Himalayas from Nepal to Assam, Eastern Bengal and Burma north of Thaunghoo and Karenni; both these birds have fulvous breasts and only differ in the former being smaller than the latter. In winter they are practically similar to the Baya. The Eastern Baya is even a more familiar bird than the Baya, as it, besides building in our gardens, also, sometimes, enters verandahs attaching its nest to the thatch on the eaves or to some trellis work. The Malay race, on the other hand, usually builds on trees overhanging water and is said to be never far from paddy-fields or the banks of the larger rivers; the late Mr. Robinson mentions that their nests are generally situated near the nests of the large handsome, but vicious, hornet (*Vespa cincta*) and the red ant (*Œcophylla smaragdina*) which is equally vicious. The nests of all these Bayas are similar, except Finn's Baya, which makes a more or less rounded one with the entrance on the *side* and attached to the tree in two or more places.

Of the four Weaver-birds the Black-throated one can easily be recognized by its black breast in the breeding season, the black being lightly fringed with fulvous in the winter months; in the summer the crown of the male is a glistening golden-yellow; the other three have the breasts fulvous streaked with black.

The Black-throated Weaver-bird (*Ploceus bengalensis*) is found from Sind to Assam, Cachar, Sylhet and Manipur. It is common in Bengal and Bihar and we have taken many nests in the latter district. They are like those of the Bayas but, usually, have only a very short entrance tube and the blades of the grass, etc., are built into the body of the nest instead of the long neck of the Bayas' nest. We found them breeding in both sugarcane and *ekra* jungle but they, occasionally, build in bushes. The colonies are usually very small, generally numbering about four or five and seldom exceeding twenty; they breed from May to September, the majority of the eggs we took were laid in July and August; normally they lay three or four eggs but we have found five and once took seven but these were, probably, the produce of two birds; many eggs are destroyed by the pretty little Long-tailed Tree-mouse (*Vandeleuria oleracea*).

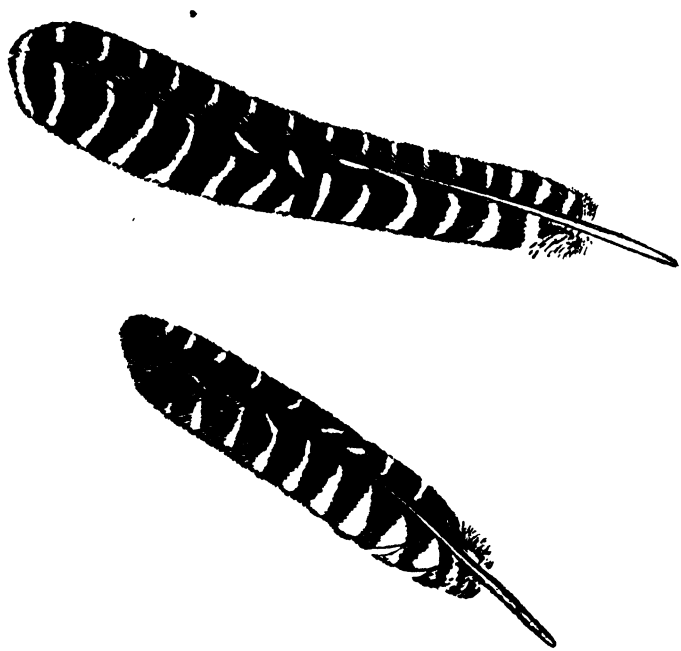
The Striated Weaver-birds differ very little from each other; the Madras race (*Ploceus manyar flaviceps*) has in summer the crown of the head golden-yellow, sides of the head, chin and throat ashy-black; the upper plumage blackish-brown edged with fulvous and the lower plumage fulvous with broad dark centres on the upper breast decreasing to narrow lines on the lower breast; it is found in the south of India as far north as Bombay, the Deccan, South Orissa and Ceylon; the Sind race (*Ploceus manyar striatus*) only differs from the preceding bird in being paler with finer striations below; it occurs in Sind, the Punjab and North-West Frontier Province; the Burmese race (*Ploceus manyar peguensis*)

is the richest coloured race, the upper plumage being edged with rufous instead of fulvous and the lower plumage more heavily streaked: in winter all the Striated Weaver-birds can be recognized by their streaked breasts; this race occurs in the Himalayan Terai from Garhwal to Eastern Assam and in the humid tracts throughout Bengal and Northern Orissa and in Burma south to Tavoy and in the Shan States. They all like reed-covered swamps to breed in and the nests are very similar to those of the Black-throated Weaver-bird, except that, in the Burmese race, there are fewer supports and less of the material is woven into the nest; they are very gregarious breeders, the Sind race often breeding in huge colonies. Hume once found nearly a hundred nests " in a small bulrush island not 20 yards in diameter ".

Like most of its relatives, the Weaver-bird is largely granivorous, feeding on seeds of grass, paddy, millets, and weeds, but a certain proportion of insect food, mostly small beetles and caterpillars, is taken. It cannot be claimed as a useful bird, and during times of forest fires the nests sometimes burn through at the base and may then be blown, all ablaze, for hundreds of yards into areas which would otherwise escape from the fire.

Its feeding habits make it comparatively easy to keep the Baya as a cage-bird and it is often so kept, young birds being offered for sale in Calcutta during August. Given a large enough space, the Baya will weave its wonderful nest in confinement, but requires all the space for itself for, as Cunningham says, " they are very undesirable additions to any aviary containing other kinds of small birds, as they are very aggressive, and are possessed by a deeply-rooted desire to hammer in the skulls of their neighbours, which, as Abdur Rahman in his autobiography remarks of a Baluchi tribe of similar disposition, ' naturally causes disputes ' ".

Young Bayas are readily tamed and easily acquire tricks, such as threading beads, drawing up little buckets of water or of seed, or loading and firing off a toy cannon. Lockwood Kipling tells of one which flew up to a tree at the word of command, selected a flower or leaf, plucked it, and, returning, placed it daintily between its master's lips. There is no doubt that it is an intelligent bird and it is therefore a favourite cage-bird. In the Punjab a popular proverbial rhyme contrasts the house-building talents of the Weaver-bird with the helplessness of the shelterless monkey which cannot protect itself against the weather in spite of possessing human hands and feet. "This verse", says our informant, "is often quoted for the benefit of idle boys and girls who object to learn", much in the same way as the little busy bee is held up for infantile admiration in Western lands.



Feathers from tail and wing of female Koel.

THE HOUSE-SPARROW

(*Passer domesticus*)

THE Indian House-Sparrow needs little introduction to our readers, as it is only too familiar throughout India, occurring abundantly in all towns and by no means uncommonly in all country districts. The Indian race differs slightly from the form so familiar in Europe in being usually much whiter about the sides of the head and in having more black below the eye and at the base of the cheeks, so that the Eastern form looks more brightly coloured than the Western, but these characters vary considerably and the Indian race is not now considered as more than a local form of the European species. However, as Hume says, "What is in a name? Call him *domesticus* or *indicus*, it doesn't alter his depraved nature, does not make him one whit less detestable—only there is a certain *lucus a non lucendo* sarcasm involved in the Linnæan name that aggravates.

"If domesticity consists in sitting upon the punkah-ropes all day, chit, chit, chit, chittering ceaselessly when a fellow wants to work, banging down in angry conflict with another wretch on to the table, upsetting the ink, and playing old Harry with everything, strewing one's drawing-room daily with straw, feathers, rags, and every conceivable kind of rubbish in insane attempts to build a nest where no nest can be—if, I say, these and fifty similar atrocities constitute domesticity, heaven defend us from this greatly lauded virtue, and let us cease to preach to our sons the merits of *domestic* wives! Conceive a wife evincing similar tendencies! Why, there isn't a jury in the country who would

not return a verdict of 'sarve her right', even if the unhappy husband should have wrung her neck before the golden honeymoon had run out."

The above condemnation of the Sparrow is certainly sweeping but there is no doubt that this bird must be regarded as a decided pest of all well-ordered households in a country such as India where the numerous open doors and windows afford easy entrance and exit and the lofty rooms and verandahs, with their heavy projecting cornices and numerous chinks and crevices, provide the Sparrow with such a convenient variety of suitable nesting-places. Noisy, pugnacious and untidy will perhaps sum up the character of this bird. Cunning, crafty, hardy, and well-nigh omnivorous, it has become a parasite of the human race and is well described by the epithet of "the avian rat", flourishing especially in localities such as towns, where human activities have upset the normal balance of Nature and destroyed or driven away the natural checks, especially the birds of prey which help to reduce the numbers of this bird in rural areas.

In Europe, America and Australia the House-Sparrow is justly regarded as a very serious pest of growing crops and, although relentless persecution is carried on and its numbers kept in check, it is still able to inflict annually loss and damage that can only be reckoned in millions of pounds. In India, things are not quite so bad mainly because the Sparrow is kept in check by natural causes except in large towns. Not only do its disorderly and noisy habits make it an active nuisance in and around houses, but its food consists largely of vegetable matter acquired at the expense of its rightful human owners. Mr. Mason examined the stomach contents of eight birds at Pusa and Mr. D'Abreu of eight others at Nagpur and in all cases they were found to contain seeds of various grasses, including cultivated forms such as rice and oats;

none of the birds from Nagpur contained any insects and of the eight from Pusa only two contained, between them, two small weevils and another small beetle. The young nestlings, it is true, are fed largely on an insect diet, composed chiefly of caterpillars, but as the young grow older the proportion of insect food given them is diminished until, when they are about three weeks old, their diet is made up almost wholly of grain. The same story is revealed in Australia, whither this bird has been introduced with the unfortunate results so often encountered in the case of introduced animals and plants, and in a Bulletin on " The Food of Australian Birds " we read that, of 127 Sparrows examined, sixty-four birds contained wheat and maize seeds and it is remarked that this bird is " a pest anywhere, in spite of the fact that it eats many insects ". Besides grass-seeds and occasional insects, the Sparrow does not disdain the smaller fruits and in the mulberry season an extra annoyance is added to its presence in houses owing to its partiality for this fruit.

The nesting season is principally from February to May but two or more broods are undertaken annually and breeding continues throughout the year, the semi-domesticated conditions of this bird's existence not restricting it to any one season of the year. Its nest is a shapeless bundle of straw, grass, rags, wool or anything else obtainable, thickly lined with feathers and stuffed into any available hole or recess in or about houses, walls, old wells, etc., or rarely even in the centre of a thick bush. If a tree or a climber on a wall be chosen for the nesting site the nest is better made and is often a substantial dome-like structure with the entrance at the side, but its position is usually betrayed by long untidy pieces of straw left trailing outside. Five or six eggs, sometimes even more, are laid at each breeding season, the eggs being typically somewhat elongated ovals and but little pointed, either greenish, greyish, or yellowish-white, marked with close

frecklings, fine lines or smudgy streaks of dull dingy sepia, olive, yellowish or purplish-brown, these markings being sometimes sharply defined, and often showing a tendency to form a blotchy, mottled, ill-defined cap at the larger end. The eggs vary much in size but average about 20 mm. long by 15 mm. broad.

Besides the natural enemies of the older birds, the nestlings are attacked whilst in the nest by the grubs of a fly, *Passeromyia heterochæta*, which lays its eggs in the nest and whose larva buries its anterior extremity in the skin of the nestling, usually under the wings or the legs, and sucks its blood. This fly is widely distributed in Africa and has been found in China and in India at Pusa and Coonoor and is probably widely distributed in India. The numbers of the adult birds are largely kept down in the *mofussil* by hawks and probably also by the Indian Vampyre Bat (*Lyroderma lyra*) which hunts by night along the hedges in which these birds congregate in the evening to sleep in flocks, this habit affording an opportunity of netting them in quantity when it is desired to reduce their numbers.

Mr. Stuart-Baker divides the House-Sparrows into three races, the Indian House-Sparrow (*Passer domesticus indicus*) ranging from "Kathiawar, Cutch, Sind, Baluchistan, Punjab and North-West Frontier Province to Gilgit, Rajputana, the United Provinces, Northern Central India into Bihar and Chota Nagpur", this is the race depicted in our Plate and is the palest form; the Burmese House-Sparrow (*Passer domesticus nigricollis*) found in "Ceylon, India south and east of the range of *Passer domesticus indicus*, Assam, Burma east to Karenni and south to Moulmein"; it differs in the male being a deeper chestnut above and the wing patch very conspicuous; females differ in being darker above and having a less conspicuous eyebrow. Some naturalists do not allow this race; Sikkim birds are intermediate between this and the next race; the

Kashmir House-Sparrow (*Passer domesticus parkini*) occurs in Kashmir, Ladakh and Tibet and in winter in North-West India and Baluchistan; it differs from the preceding race in being larger and the chestnut of the male deeper and black on the breast more extensive; the female is also larger and darker.

The habits of all are the same. There are few places where House-Sparrows, in one form or another, do not occur but the Andamans, Nicobars and Burma below Moulmein have escaped that privilege !! They are common in Simla but have not yet succeeded to penetrate into the Darjeeling district above 4,500 feet and in the station itself the Malay Tree-Sparrow (*Passer montanus malaccensis*), a much superior bird, reigns supreme.

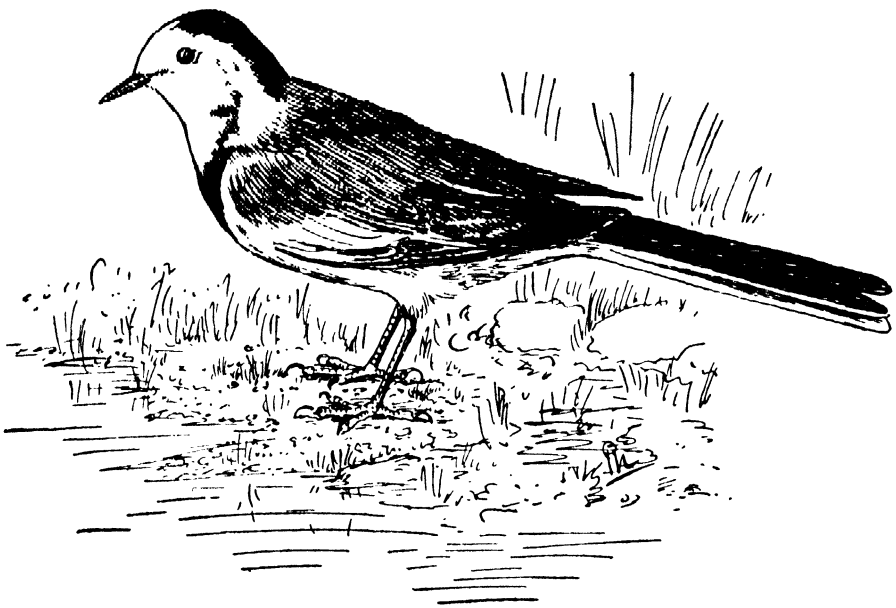
THE WHITE WAGTAIL

(*Motacilla alba*)

INDIA has many birds which visit the Plains as winter tourists only, passing the summer months either in the Hills or in "the back of beyond" far to the north of the mighty Himalayas. Everyone is familiar with the fact that ducks, for example, migrate in this way but it may be news to some of our readers that most of our common wagtails also act in this manner, visiting India only in the cold weather and passing the summer in Northern Asia. About a dozen different forms are found in India but only one (*Motacilla maderaspatensis*), a black wagtail with a conspicuous white eyebrow, looking not unlike a magpie-robin but never carrying the tail erected, is a permanent resident. All are very similar in general build, being slenderly built, dainty-looking birds, mostly coloured in mixtures of black, white and grey, occasionally yellowish or greenish, their delicate slimness harmonizing well with their lightness of gait as they run with great speed after their quarry, never hopping but sometimes making little sallies into the air, and constantly wagging their tails whose outer feathers are always white and conspicuous during flight; whence their popular name. Then, as Cunningham has well remarked, they are so alluringly tame, merely running on in front of one and expostulating at being disturbed; and, if persistently followed along a narrow path, making off on a brief, undulating flight to pitch anew a little way ahead in a way that gives one the fullest opportunity of becoming familiar with them. They are so tame that they often come into verandahs of bungalows and pick up insects off the floor. The migrant species usually arrive in India during September and remain with us until

the end of the cold weather, the White Wagtail leaving Bihar before the end of April.

Wagtails feed mostly on small insects, chiefly flies, small beetles, ants and caterpillars, but occasionally pick up seeds also. The insects eaten are not of any beneficial kinds and in many cases are injurious to crops, and therefore these birds as a whole must be reckoned amongst the farmer's friends. It is a pity that most of



White Wagtail.

them are absent from India during the rains, when insect life is so abundant. When hunting for water insects they will sometimes completely submerge their bodies in the water. The particular species which we have selected as a representative of this group is the Indian White Wagtail (*Motacilla alba dukhunensis*), which Dewar briefly describes as general colour of plumage grey; face, chin, and throat white, back of head and nape black; a black

patch on the breast, the remainder of lower plumage white ; the wings white with much black on them ; the middle tail-feathers black, the outer ones white. Our Plate gives a good general idea of its appearance. It has a very pleasant note. It is found throughout most parts of India during the winter months but does not occur in Southern India nor south of Moulmein in Burma. The Masked Wagtail (*M. alba personata*) differs from *alba dukhunensis* by the ear-coverts and sides of neck being always black, whereas in *M. alba dukhunensis* these parts are always whitewashed. The distribution of *M. personata* much resembles that of *M. alba dukhunensis ;* it is a constant resident and breeds in Kashmir and the North-West Frontier.

The Streak-eyed Wagtail (*Motacilla alba ocularis*) differs from the other White Wagtails in having a black streak through the eye ; it is found in winter in Burma, Assam and Eastern Bengal and is the commonest White Wagtail in Assam during that time of the year. There are three other races of White Wagtail, the Persian White Wagtail (*Motacilla alba persica*), some specimens from North-West India are considered to be this race and Swinhoe's White Wagtail (*Motacilla alba baicalensis*) a record of which there is from North Cachar. All of these Wagtails frequent gardens, etc., just the same as the typical race (*Motacilla alba alba*) which is a rare straggler to North-West India and the Punjab apparently not so rare there as five out of seven collected by Mr. Whistler at Jhelum were identified as this race.

The White Wagtail (*Motacilla alba alba*) is a regular visitor to England during its time of migration from the Continent of Europe and breeds in England at times and has been known to pair there with the Pied Wagtail (*M. lugubris*), a species which does not occur in India. Its nest has been found there in such odd places as in a Sand Martin's burrow, in the middle of a strawberry bed, and

amongst a Virginian creeper growing over trellis-work. The eggs are white, speckled with reddish-brown.

The habits of the White Wagtail resemble those of the Pied. Dr. A. G. Butler gives some interesting notes on the latter species, in the course of which he says, " their power of turning in the air is astounding ; few insects, however eccentric their flight, can hope to escape them. If a Wagtail is on the ground and it sees an insect flying towards it, instead of starting madly forward to meet its prey, it excitedly watches all the insect's movements and suddenly (when the latter is almost overhead) the agile bird rises with a rapid spiral movement, which looks almost like a somersault, the snap of its mandibles is heard, and all is over ". He also writes, " even when caught wild, most examples of *Motacilla* soon become tame if kindly treated ; they are easy to feed, living for years upon crumbled household bread, yolk of egg and ants' cocoons, moistened (either by the addition of a little water or mashed potato), and a few insects, their larvæ or spiders from time to time ".

As most species of Wagtails are not permanent residents and do not breed in India, they have not received legislative protection in most Provinces, except in Bengal where they are protected throughout the year and in Burma where they are protected in reserved forests from being hunted, shot, snared or trapped for purposes of trade.

THE TREE-PIPIT

(*Anthus hodgsoni*)

THE Pipits, contained in the genus *Anthus*, are all rather dull-coloured birds in shape like Wagtails, to which indeed they are closely allied, and may be recognized by their streaked upper plumage and comparatively short tail. Over twenty different kinds occur within the Indian Empire and resemble one another very closely, so that they are difficult to distinguish in the living condition, their identification depending on such small points as the length of the hind claw and slight differences in coloration. To the ordinary observer, then, all the Pipits look much alike and a bird which is seen to look much like the one depicted in our Plate may be set down as a Pipit but may not necessarily be the Indian Tree-Pipit. Pipits as a class are very highly parasitized by the Common Cuckoo, several species of these birds having been found to be victimized in this way, but apparently there is no record of the subject of our present article having been made use of as a foster parent.

This is too large a group to go into in any detail so we only give two very common species.

The Indian Tree-Pipit is another bird which, like the Indian White Wagtail, is only a winter visitor to the plains of the whole of India and Ceylon. In Bihar and Bengal it appears amongst the very earliest of the autumnal immigrants and remains in considerable numbers until about April, but during the summer

it retreats to the Himalayas, Afghanistan, Gilgit, Kumaon, Kashmir and Garhwal to breed. When they first arrive in India in the autumn their plumage is in fine condition and brightly marked but their colour becomes decidedly duller during their stay.

Tree-Pipits are very partial to mango groves and are rather shade-loving birds. However, they also frequent open spaces, such as garden paths, much in the same way as the Wagtails, and similarly keep their tails in constant rocking motion whilst pacing over the ground. When preparing to take flight they have a curious habit of swaying themselves about for a time, and when alarmed they fly up to the nearest tree and walk about on the branches in a decidedly un-Wagtail manner. They are fairly social and frequently go about in small flocks, and feed on the ground on seeds of grass and weeds and on small insects. Seeds are oftener consumed by these birds than by the Wagtails, which are practically totally insectivorous. The late C. W. Mason examined the stomach contents of sixty-seven birds at Pusa and Mr. D'Abreu those of three birds at Nagpur, and in all these seventy cases the birds contained seeds of weeds, injurious or neutral insects, and a few small snails. From an agricultural point of view, therefore, the Tree-Pipit may be put down as a decidedly beneficial bird, in spite of which fact it is commonly sold in the markets as an "Ortolan".

As remarked by Mr. Stuart-Baker they build at all elevations in the hills from 8,000 up to 15,000 feet. In Northern Kumaon it affected grassy slopes in the immediate vicinity of woods; these open glades are thinly covered with trees and overgrown with beautiful thick, soft, velvety grass, about a foot high, with occasional tussocks, under which are concealed the nests, built of dry grass blades, or of green moss lined internally with fine grass-stems. The eggs usually number four but three and five are also laid,

the ground colour is of various shades of grey or stone colour speckled all over with reddish-brown, brown or greyish-brown but the speckles are usually so dense that little of the ground colour is visible. They breed from May to July.

Mr. C. M. Inglis found the nests of this bird at Sandakphu (elevation 12,000 feet) in the Darjeeling district on 2nd July, 1904, and also at Tonglu (elevation 10,000 feet) on the following day. Sandakphu has a kind of alpine pasture, the ground being carpeted with many beautiful herbaceous plants of alpine character, such as Primulas of several kinds and Aconite ; also amongst the rocks occurs a common stiff-branched shrub (*Potentilla fruticosa*, Linn.) with handsome yellow flowers and silvery foliage. The nests were made of grass and roots with a leaf or two on the outside and found on the sloping grassy banks, generally hidden under a clump of grass, often also close to the rocks. On 2nd July young birds had already hatched out but fresh eggs were obtained on the following day. Mr. Whistler describes some nests as " a shallow cup composed of moss and dry grass, lined with fine dry grass-stems and a few hairs " ; those we took had no moss in their construction.

During the 1921 Mount Everest Expedition a specimen of the Indian Tree-Pipit was collected on East Everest at a height of 17,500 feet and this species was observed migrating on the side of Mount Everest at an elevation of 20,000 feet.

The Indian Pipit (*Anthus richardi rufulus*), or Indian Tit-Lark, is a very similar species which is likely to be found in any garden in which the grass is allowed to grow long. It is one of the Pipits with long hind claws and are fulvous-brown above and fulvous below with a few brown streaks on the breast. Unlike the Tree-Pipit, it remains with us throughout the year, breeding in the

plains and lower hills of India and Burma. Where suitable open grassy spaces are available, this bird builds at the beginning of the hot weather, its nest being placed in the shelter of tufts of grass or under clods or similar objects affording some shelter. The nest is composed of a thin lining of dried grass placed in a slight depression in the ground, which must often get flooded out during heavy rain, but the occasional destruction of the first brood in this way is compensated by the rearing of a second brood about the end of May.

The female Koel, with her brown white-barred plumage (*see* figures of feathers on page 94, *ante*) is very different in appearance from the male Koel, which looks like a larger edition of the Drongo (*see* Plate X). The manner in which the two sexes combine to parasitize the Indian House-Crow is described on page 13.



Hen Koel.

THE WHITE-EYE

(*Zosterops palpebrosa*)

ALL of the birds with which we have dealt in our previous papers have been not only common, but also conspicuous species probably well known to all who live in India. The subject of our present note, however, although sufficiently common in all localities in the Plains, is decidedly not a conspicuous bird and is easily passed over unnoticed.

The White-eye is a small bird, two-thirds only of the size of the common sparrow, in colour greenish-golden yellow, greyish-white below, with a bright yellow chin and throat and a patch of yellow beneath the tail ; around the eye is a ring of white feathers, whence this bird derives its popular English name ; on this account it is also sometimes called the Spectacle Bird. It seems to have no vernacular Indian name. This white eye-ring is distinctive and readily permits the identification of its owner as a member of this group, which is placed as a separate family, the Zosteropidæ. Eleven species and sub-species of White-eye are recognized in the *Fauna* volume on Birds, of which *Z. palpebrosa* is split up into six subspecies. These come into two groups, of which five have no yellow streak down the centre of the abdomen and the sixth, the Cachar White-eye (*Zosterops palpebrosa cacharensis*), has one ; the others are impossible to distinguish except in the hand as they only differ in the tone of the colour of the plumage and length of the bill. We will only give the names and habitat of these six, as given by Mr. Stuart-Baker. The Indian White-eye (*Zosterops palpebrosa palpebrosa*) : " Bengal, Orissa, East Central Provinces and

Southern India, including all the hilly country from Mysore southward both to the East and West" ; the North-West race (*Zosterops palpebrosa occidentis*) : "North-West Himalayas, North-West Frontier Province, Sind and Punjab" ; the Northern race (*Zosterops palpebrosa elwesi*) : "West Central Provinces, Rajputana, Himalayas and East Assam, North Shan States and Kauri-Kachin Hills" ; the Small Ceylon race (*Zosterops palpebrosa egregia*) confined to "Ceylon and the Laccadives" ; the Cachar race (*Zosterops palpebrosa cacharensis*) : "Assam, south of the Brahmaputra River, Manipur, Lushai, Tippera, Chittagong and the Chin Hills" ; the Nicobar race (*Zosterops palpebrosa nicobarica*) from the "Andamans, Nicobars and Car Nicobar".

All the White-eyes are small birds, which go about in flocks, frequenting trees and bushes, whose leaves they search for small insects, varying their food at times with small buds, seeds and fruits. Like most other birds which associate in small parties, they keep up a constant call one to another, their call being best described as a cheeping twitter.

The food of the White-eye consists of a mixed diet of insects and vegetable matter. Of sixteen birds examined at Pusa by the late C. W. Mason, eleven contained small buds, seeds and wild fig fruits, and five contained insect food, consisting mostly of weevils and ants. One bird, examined by Mr. D'Abreu at Nagpur, had been feeding on berries of *Zizyphus œnoplia*. The White-eye has also been recorded as damaging ripe mangoes and guavas, and will eat plantains when in captivity. In spite of a decided taste for ripe fruit, however, this bird cannot be called a pest of fruit-trees and probably does a considerable amount of good by picking off small insects throughout the year.

The White-eye occurs throughout the whole of India, both in the Plains and in the Hills, in Ceylon and the Nicobars, and in

Burma. It breeds, according to locality, from January to September, but the beginning of the hot weather is its normal breeding season in most localities, and at that time the cock bird sings a sweet little song. In North Bihar it breeds from April to July, the earliest nest having been found on 1st April and the latest on 23rd July. With the exception of one nest found in a jack tree all the nests found have been in mango trees. Sometimes there are two broods in the year. The nest is suspended between two twigs or more rarely in a fork of a branch, at any elevation from less than a foot to sixty feet from the ground, but the majority build at comparatively low elevations, between two and six feet from the ground. It varies much in size and in the materials of which it is composed but is always a soft, delicate little cup, sometimes quite shallow, sometimes decidedly deep, and almost always is suspended like a miniature Oriole's nest, from small twigs or leaves. The parent birds set to work with cobwebs and first tie together two or three leafy twigs, to which they intend to attach their nest, and then use any available fine fibrous material (such as vegetable fibres, fine roots, thread, floss silk or cobwebs) to complete the outer fabric of their very beautiful and compact nest. As the work progresses, more fibres and cobwebs are used, so that the nest might be taken by a casual observer for an accidental accumulation of rubbish caught in a spider-web. The interior is lined with silky seed-down, hair, feathers, moss, fine grass, etc., according to the materials available. The external diameter of the nest is about $2\frac{1}{2}$ to 3 inches and the depth varies from one to two inches, the egg cavity being about $1\frac{1}{2}$ inches in diameter. Two eggs are laid as a rule, occasionally three and very rarely four. The egg is rather long and pointed at the smaller end, about 16 mm. long by 12 mm. broad, in colour uniformly very pale-blue or greenish-blue, without any markings; but occasionally the egg is capped with a zone of rather deeper and purer blue.

Our Plate gives an excellent idea of this bird and of its nest as built in the fork of a branch of a mango tree.

An interesting account of the feeding of the young is given by B. B. Osmaston, who says that he observed one of the parent birds place rather a large insect into the wide open mouth of one of the young which in spite of many efforts appeared to be unable to swallow it; the other parent, which was watching operations from above, seemed to grasp the situation at once, for he (or she) bent down and put a small drop of liquid into the widely gaping mouth; the process of giving small drops of liquid was repeated in front of the observer quite four or five times, and he was so close that there could be no mistake; eventually the insect became soft and more manageable and the little bird's efforts were crowned with success.

The Indian White-eye is commonly seen in the Calcutta bird market at Tiretta Bazaar and is easily kept in confinement on a diet of bread and milk, soft fruit and small insects, and is well worth keeping.

SOME SUNBIRDS OR HONEY-SUCKERS

THE Magpie-Robin described in a previous article is by no means the only bird whose cheery notes enliven our compounds. Conspicuous amongst the smaller feathered songsters and appealing both to eye and ear are the exquisite little Sunbirds or Honey-suckers, of which the males, clothed in metallic colours, are amongst the most beautiful of the birds which occur in India. We have none of those lovely little gems, the Humming-birds, which flash splendidly from flower to flower in South America, but we may almost imagine that we have when we see a tiny bird, clad in the most brilliant purple plumage, hovering over a flower with rapidly vibrant wings and extracting nectar with its long tongue, quite in the manner of a Humming-bird or Hawk-moth. Such a bird is almost sure to be the male of one of our species of Sunbirds belonging to the genus *Leptocoma*, of which twelve species occur within Indian limits, but of these only three are commonly distributed in the Plains: Loten's Sunbird (*Leptocoma lotenia*), which occurs in Ceylon and Southern India, being wholly dark metallic purple above, with a snuff-brown abdomen and a long curved beak; the Purple Sunbird (*Leptocoma asiatica*), which is found throughout the Plains of India and in Ceylon, but is only a summer visitor to the Punjab, being very similar to the preceding, but with a violet-black abdomen and a shorter curved beak; and the Purple-rumped Sunbird (*Leptocoma zeylonica*) which occurs in Ceylon, Southern and Central India, but not in Northern India or Burma, and is distinguished from the other two by its bright yellow lower plumage and crimson back. In Calcutta the Purple-rumped Sunbird is the commonest

species and occurs in all gardens; the male is a very beautiful little bird, bright canary-yellow underneath with rich reddish-brown wings and back, a lovely violet throat and a gleaming crown of metallic green on its head. The females of these three species do not possess the brilliant metallic coloration of their mates and have to be content with a dress which is earthy-brown or greenish-brown above and yellow beneath.

The Purple Sunbird (*Leptocoma asiatica*) has three races: the Indian Purple Sunbird (*Leptocoma asiatica asiatica*) found in Ceylon and the whole of India except where the next two races occur; the Burmese race (*Leptocoma asiatica intermedia*) occurring in Assam and Burma; the Sind race (*Leptocoma asiatica brevirostris*) in Sind, Baluchistan and border-land of the North-West Frontier Province. They are all more or less alike, only differing in the size of the bill and richness of coloration, the males of the typical race being the less richly coloured and with less scarlet on the tufts which spring from the sides as seen in our Plate; the Burmese race is very richly coloured and has more scarlet on the pectoral tufts; the Sind race differs in its smaller bill and less brilliant upper parts. In Assam and Eastern Bengal the Burmese race is rarely found in gardens.

We must mention one more of this genus as it is, to our mind, the loveliest of them all, and also visits gardens; it is Van Hasselt's Sunbird (*Leptocoma brasiliana*). The male is a veritable gem. It is found, though rare, in Assam and Cachar, but commoner in parts of Sylhet and occurs in Chittagong, Manipur, across to Burma and is very common in the south of Tenasserim principally frequenting gardens and coco-nut palms. The male has the whole of the top of the head intense metallic golden-green; the upper plumage velvety-black; from the chin to foreneck intense rich amethyst; the breast and

upper part of abdomen rich deep maroon and the remainder of the lower plumage is black. The females differ little from those already mentioned.

In their habits all the species are very similar, frequenting flowering trees and shrubs, in gardens or forests, extracting the nectar from the flowers with their long tubular tongues, either occasionally hovering on the wing or more frequently clinging to slender twigs. But, besides carrying out the poet's dictum,

"For he on honey-dew hath fed",

these little birds variegate their diet with small insects, for catching which their long bills are admirably adapted, both mandibles being serrated along the terminal third of their length. Small spiders, caterpillars, beetles, bugs and flies, probably in most cases themselves visitors to flowers, fall a prey to these birds. We have also seen the Purple Sunbird picking insects from off the ground and also flying up and catching them on the wing.

Besides being useful in helping to reduce the numerous insects which haunt our gardens, Sunbirds are also directly beneficial by helping to pollinate many flowers. Writing of *L. zeylonicus* in Calcutta, Cunningham says that "the curious narrow tubular flowers of *Hamelia patens* are very special favourites, owing to the large store of nectar in their lower ends; and during the whole time that the shrubs are in flower they are sure to be alive with honey-suckers every morning. In this, and doubtless in many other cases, they seem to play a very important part in securing cross-fertilization; for, by the help of a field-glass, one can clearly see that every time their bills are withdrawn from one tube and thrust into another, they are thickly smeared with golden pollen; and when flowers from which they have just been feeding are

examined, the long oval stigmas will be found coated with adhering grains. In rifling the flowers, therefore, they confer a benefit on the plant, and do not play the part of mere robbers, like the great brown hornets, who share their liking for the nectar, but who, in order to reach it, drill holes through the corollas below the level at which the anthers lie.

"Curiously enough, they do not seem to care for the fluid in the corollas of the silk-cotton trees, which is so attractive to so many other kinds of birds that the trees, when in full bloom, become noisy and riotous taverns thronged with excited topers. The unopened flowers of *Hibiscus rosa-sinensis* are greatly frequented in the early morning on account of some attractive material to be found at the bases of the petals. Erythrinas are also very popular; the clusters of their bright-red flowers are very often alive with a throng of clinging and fluttering little thieves; and an even more charming picture presents itself when the latter are busy among the deep green foliage and tufted crimson inflorescence of *Hæmatocephala Hodgsoni*".

In his volume, *Some Indian Friends and Acquaintances*, Cunningham gives a long and charmingly written account of the habits of *L. zeylonicus* in Calcutta, from which we would willingly quote at further length, did space permit, and we can only advise our readers to refer to Chapter XI of his book.

The Purple-rumped Sunbird is the dominant species in Calcutta, but in Bihar our common species is the Purple Sunbird, which is depicted on Plate XX. This is a less sociable bird, more often seen alone and not in company with others, as one sees *L. zeylonicus*, but it is a much better songster than the latter, singing much like a canary; during the rains, however, in the non-breeding season, it seems to become more sociable and a dozen or more of these

delightful little birds may often be seen feeding on one flowering bush, fluttering and hopping about or swinging head downwards suspended by their strong prehensile feet whilst they imbibe the nectar from the flowers, the still, damp air alive with their cheerful twitterings. The cock bird in the breeding season is a truly gorgeous little creature, appearing a blue-black at a little distance ; but when seen at close quarters the colour is a metallic violet-blue or greenish, the colour changing according to the intensity and angle of the light on it so that it may appear shining blackish-purple or green or more often mauve.

". . . . . cœu nubibus arcus
Mille iacit varios adverso sole colores ".

Under the base of his wings he carries a large tuft of mixed orange-red and yellow feathers, which is ordinarily concealed under the wings, but which projects when the bird is settled for repose and is displayed when courting. Like human bipeds, however, the Purple Sunbird does not wear his wedding garments throughout the year, for after the nesting season is over he doffs them and assumes female plumage, retaining only a dark metallic violet streak from chin to abdomen as a mark of his sex. It may be added that there is a certain amount of difference of opinion as to whether the purple plumage of the male is or is not retained throughout the year, Messrs. Oates and Dewar contending that, when once assumed, it never changes ; but Finn, in an article in the *Journal of the Asiatic Society of Bengal* (Vol. LXVII, Part II, No. 1, 1898), settled this question, having noticed the change take place in a specimen which he kept, and which, when he got it, was mostly purple but by the first week of August was in non-breeding dress. We agree with Finn as to the change and, from observations made at Pusa, can state definitely that males in full breeding (purple) plumage are not to be found during the rains when the majority of males are in non-breeding plumage although an occasional one

may be seen in a sort of half-and-half condition. The female is greenish-brown above, rather bright yellow below with the tail brown or blackish and the laterals narrowly tipped with white. The male especially is a most pugnacious little creature, not hesitating to attack other birds much larger than himself, and sometimes even scrabbling and tapping at windows, apparently attempting to assault his own reflection in the glass. The breeding season in Bihar is from February to May, the earliest nest found with eggs in it being on 12th February and the latest on 30th May, and there are generally two or more broods in rapid succession, usually in the same nest. In Northern India, the laying season is later, in May and June, or as late as July or even August. In Southern India, eggs are to be found from January to June, but mostly in February to April. It breeds all over the Plains and to the summits of the Hills in Southern India and up to a height of about 5,000 feet in the Himalayas.

The nest is hung suspended from a twig or any convenient support and is composed of a very miscellaneous and heterogeneous mixture of materials beautifully woven together with the silkiest fibres and cobwebs, hair, fine grass, leaves, small pieces of dead wood, chips of bark, lichens, rags, scraps of paper, thorns, etc., all being made use of. The body of the nest is usually oval, with various scraps of material hanging below, while the apex of the oval is produced into a cone meeting the point of support. The nest is lined with silky-white seed-down, very neatly affixed to the interior. The entrance is a small oval or circular hole, about the centre of the nest and in some cases, but not always, a small projecting cornice is constructed just above the entrance; at Pusa practically all the nests seen have been provided with this little porch over the entrance, which does not seem to be oriented in any particular direction. The purpose of the porch is apparently to keep rain out of the nest. On the side opposite

to the entrance the wall of the nest, which is ready some days before the eggs are laid, is pushed out a little so as to give room for the tail of the sitting bird. This pushing out of the back of the nest is one of the last portions of the work, and the female may be seen going in and out to try the fit, over and over again. When sitting, the head of the bird is seen just peeping out of the entrance. The completed structure looks like anything but a nest and resembles a mass of dead leaves and rubbish caught in an old spider's web. The rows of sticks which support edible and sweet peas in our gardens form a very favourite nesting site for this bird in North Bihar, as these sticks are in the ground during February and March, but the nest may be suspended almost anywhere, usually from the end of a branch of a bush or small tree, preferably a thorny one. A creeper, such as rose, *Quisqualis*, or *Stephanotis*, growing up the outer wall of a bungalow, is a very favourite site. It is usually placed between two and five feet from the ground but we have seen one as high up as forty feet. The nest shown in Plate XX, as will be seen, was hung on to a piece of wire netting. Suspended in this way it is tolerably safe from enemies. Two is the normal number of eggs laid, but occasionally there may be three, the eggs measuring about 16 mm. by 11·5 mm., being dull white marked with various shades of brown. Sometimes at least, only one of the young is reared up, and indeed there seems no room in this small nest for more than one fully-fledged nestling.

The Sunbirds are protected throughout the whole year in Burma, Bombay and Bengal, and presumably in Mysore also, as it is certainly a " bird of song ".

Mr. C. M. Inglis has kept a specimen of the Purple-rumped Sunbird in captivity for six months, feeding it on a mixture of sugar and *sattoo.*

Plate XX gives a good idea of the Purple Sunbird and its nest. To the left is seen a male in breeding plumage with its tufts displayed ; the female is seen feeding a young bird whose beak is seen projecting from the nest ; and below her, to the right, is a male in non-breeding plumage.

SOME OTHER SUNBIRDS

THE above-mentioned birds in the last chapter belong, as already stated, to the genus *Leptocoma*, but we have altogether some thirty-four species and races of Sunbirds within Indian limits and these are divided into four genera, the largest genus in point of numbers being *Æthopyga*, with seventeen races, containing those birds in which the males have lengthened middle tail-feathers and yellow rumps. In this genus the commonest Plains species is the Himalayan Yellow-backed Sunbird (*Æthopyga siparaja seheriæ*), a bird with most of the upper plumage crimson, as is likewise the lower plumage as far as the breast; it also has a purple moustache-like streak and the lengthened tail-feathers are metallic green; this bird is represented at the bottom of Plate XXI. This Sunbird is common in the Plains of North-Eastern Bengal, Assam and Cachar, and is also found along the foot of the Himalayas, which it ascends to a considerable height. It is parasitized in Assam by the Emerald Cuckoo (*Chalcites maculatus maculatus*), and Mr. Inglis has taken several of this Cuckoo's eggs from the nests of this Sunbird.

There are six races of *Æthopyga siparaja* in India, the males all with crimson breasts, five of which have the breast unstreaked with yellow and one with it boldly streaked with that colour, the first group may again be divided into those which have the tail metallic purple and its central feathers only slightly longer than the others and those in which the tail is green and the central feathers much longer than the others. Those with unstreaked breasts and purple tails are:—the Tenasserim Yellow-backed Sunbird (*Æthopyga*

siparaja cara) found in Burma from Rangoon to the south of Tenasserim ; this race has a green forehead and the tail violet-purple sometimes mixed with green ; the Nicobar race (*Æthopyga siparaja nicobarica*) only found in the Nicobars ; it differs from the former in having the forehead and tail both violet-purple, the latter never having any green in it. Those with unstreaked breasts and green tails are :—The Indian Yellow-backed Sunbird (*Æthopyga siparaja seheriæ*) which has already been described ; the Kumaon race (*Æthopyga siparaja mussooriensis*) occurs in the N. W. Himalayas from Garhwal and Kumaon to the Afghan border and birds from high elevations in Sikkim are probably this race ; it only differs from *seheriæ* in being larger, with a long broad tail and the scarlet on the breast brighter and it keeps to higher elevations than that race ; the Yunnan race (*Æthopyga siparaja viridicauda*) is a very doubtful race, a specimen found at Maymyo in the Shan States is said to be this race, it only differs from *seheriæ* in the abdomen being greyer and not so olive-green ; the last race Vigor's Yellow-backed Sunbird (*Æthopyga siparaja vigorsi*) is found on the West Coast of India from Bombay to Travancore ; it also has a green tail but may be recognized by the crimson-scarlet breast being finely streaked with yellow.

Another beautiful Sunbird which comes into gardens in the hills is the Fire-tailed Yellow-backed Sunbird (*Æthopyga ignicauda ignicauda*), the male is shown on the right-hand side of Plate XXI, it is found, according to Mr. Stuart-Baker, in " Nepal, Sikkim, Assam, Cachar, Sylhet, Manipur and Tipperah in Eastern Bengal. West it extends to Garhwal and Kumaon ". The Plate gives a good idea of a full-plumaged male. This bird ranges from 2,000 feet up to, at any rate, 12,000 feet at different seasons ; it may often be seen in gardens in Darjeeling in the spring but then the elongated tail-feathers have not generally been fully assumed ; we found, in May, fully adult males very common at Sandakphu

(12,000 feet) in that district and it was a beautiful sight seeing them amongst the rhododendron blooms (our Plate shows this); the other races mentioned by Mr. Stuart-Baker are too rare to require mention. The last of the Sunbirds which comes readily into gardens is also a hill bird, the Nepal Yellow-backed Sunbird (*Æthopyga nipalensis nipalensis*); the male is shown at the top of Plate XXI; this, the typical race, is found in Eastern Nepal, Sikkim across to Assam, Manipur and the Kauri-Kachin Hills, Shan States; no description is necessary. This is the commonest Sunbird in Darjeeling, frequenting gardens just as often as the forest; they are tame little birds and can be observed at a very close range. At various seasons of the year they may be found from 3,000 feet up to 10,000 feet. There are two other races, Blyth's Yellow-backed Sunbird (*Æthopyga nipalensis horsfieldi*) found in Garhwal and Kumaon with most of the upper back green instead of maroon and often with no scarlet streaks on the breast and Rippon's Yellow-backed Sunbird (*Æthopyga nipalensis victoriæ*) from Mount Victoria, Chin Hills, which differs from the latter in having the breast streaked with scarlet. Nothing has been recorded about the habits of either of these two races. The remaining members of this genus are forest loving birds but one. Mrs. Gould's Yellow-backed Sunbird (*Æthopyga gouldiæ gouldiæ*), though not *actually* shot in the garden, was found *near* the house at Mangpu in the Darjeeling District. It is a very handsome bird; its distribution is given by Mr. Stuart-Baker as "Himalayas, from the Sutlej Valley to the extreme east of Assam, Naga Hills, south of the Brahmaputra above 6,000 feet and also Mount Victoria, in the Chin Hills, from 6,000 feet upwards"; it has the top of the head, chin, throat, a patch behind the eye and one beside the breast and most of the central tail-feathers metallic purple-blue; the rest of the upper plumage crimson; the rump and lower plumage bright yellow streaked with crimson on the breast; there is another race of this species found in Assam and Manipur and probably the Duars,

the Manipur Yellow-backed Sunbird (*Æthopyga gouldiæ isolata*), which only differs in having the breast immaculate yellow, much paler than in the typical race.

The habits of all the Sunbirds are very similar and are fully given in the last chapter.

The nests of all the species of *Æthopyga* are very similar, they may be generally described as pear-shaped or oval made of cotton down held together with moss, spider-webs, fibre also is used largely in some of them and some have a porch over the entrance. The Fire-tailed Yellow-backed Sunbird often uses a thin layer of the thin pinky paper-like bark of the rhododendron in the construction of its nest and flowers and feathers are also used in the lining. With regard to localities, we found many nests of the Indian Yellow-backed Sunbirds in Goalpara in small nullahs running through evergreen forest, the nests being fastened to the roots of bushes hanging down from the overhanging banks; the Mussoorie race apparently breeds in more open forest or scrub jungle and the Nepal race frequents the more open parts of evergreen forest to make their nests; none of them ever nest in our gardens.

The Tenasserim race of *siparaja* is an early breeder breeding in January and February but the other races appear to breed between May and July; the typical Fire-tailed race breeds in April and May and the Nepal bird in April or probably even earlier, and Mrs. Gould's Sunbird during June and July. All these Sunbirds lay either two or three eggs. The description of *seheriæ* will suffice for most; there are two types, one with the ground colour pale-cream or grey blotched and spotted all over with light purplish-brown, more numerous at the thick end and forming a cap or ring; the other is pure white sparsely marked with brown but more numerous and forming a cap or ring at the large end. They average

15·1×11·4 mm. ; *mussooriensis* eggs are like the second type and measure 15·3×11·4 mm. ; *vigorsi* eggs are very like *seheriæ* eggs but larger ; the eggs of *ignicauda* vary a lot in colour and size. Mr. Stuart-Baker mentions the following types, " pure white, scantily marked with small blotches of pinky-brown ; another is creamy-pink with more numerous markings ; whilst a third is livid pink, freckled all over with purplish-red, coalescing to form a cap at the larger end ". They vary from 14·3×11·0 to 18·8×12·5 mm. (Osmaston) ; Mr. Stuart-Baker gives the average as 15·7×11·8 mm. ; the eggs of *gouldiæ* differ from all others in their very pale coloration, scantily freckled with pale reddish-brown and confined to the larger end ; the eggs of *nipalensis* are white with reddish-brown spots at the larger end ; they are longer than those of *seheriæ*.

THE GOLDEN-BACKED WOODPECKER

(*Brachypternus benghalensis*)

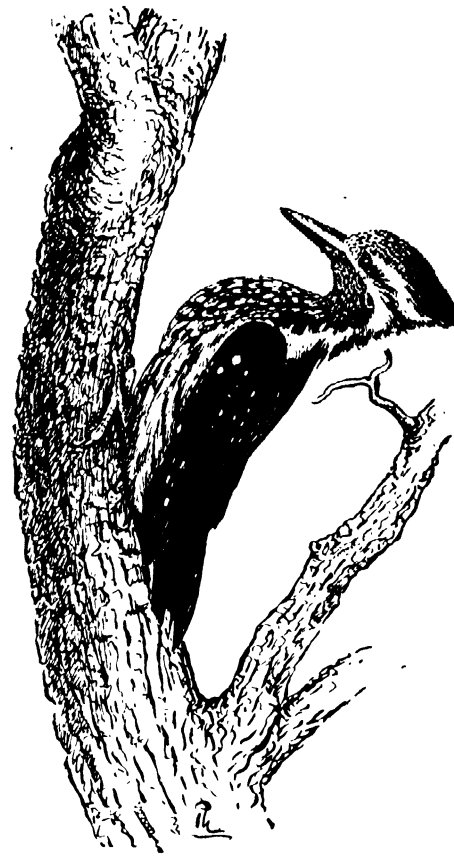
MANY of the roads on the Pusa Estate being well bordered by trees, it is a common experience to hear the quickly-repeated tapping sound of a woodpecker as it digs away with its beak at a branch in which it has perceived the presence of some wood-boring insect. If the noise is traced to its source, it will usually be found to originate from a medium-sized bird coloured in black and golden-yellow and with a bright crimson crest, which may be seen clinging to the bark with its powerful claws, supported by its short stiff tail, and hammering away with its short, stout chisel-like bill. This bird is the Northern Golden-backed Woodpecker (*Brachypternus benghalensis benghalensis*), with the throat *streaked* black and white and back golden-yellow, which is common throughout North India, Bombay, Central India, Bihar, Bengal and Orissa, ascending the hills to about three or four thousand feet, but not apparently known in Upper Assam or Burma. It is generally seen singly or in pairs and often one may be seen following the other from tree to tree. In Sind, Baluchistan, and parts of the Punjab it is replaced by the Sind Golden-backed Woodpecker (*B. benghalensis dilutus*), also with the *streaked* throat but the back more a lemon-yellow; in Southern India by the Southern Golden-backed Woodpecker (*B. benghalensis puncticollis*) with the throat *spotted* black and white and back orange-yellow; in Northern Ceylon by the Ceylon Golden-backed Woodpecker (*B. benghalensis ceylonus*) also with a *spotted* throat and back less orange and of smaller size, and in other parts of Ceylon by the Ceylon Red-backed Woodpecker

(*B. benghalensis erithronotus*), which last, as its name implies, is distinguished by having its back crimson whereas in the other races of *B. benghalensis* the back is golden-yellow or orange. Where both sub-species occur together, it is probable that they hybridize occasionally. As regards other species of Woodpeckers with which this one may be confused, the Three-toed Woodpeckers (*Dinopium*) are extremely like this bird and only markedly differ in wanting the hallux (inner hind toe). Tickell's Golden-backed Woodpecker (*Chrysocolaptes guttacristatus guttacristatus*) has also a very similar coloration but on account of its very much larger size is less likely to be mistaken for *B. benghalensis* than the Three-toed Woodpeckers.

The Golden-backed Woodpecker is an extremely handsome bird, which Dewar briefly describes as having a bright crimson crest, top of head black, sides of head white with a number of black lines and streaks, upper back golden-yellow, lower back and tail black, wings black and golden-yellow with some white spots. The female differs from the male in having the top of the head black with small white triangular spots ; it is shown peeping around the tree in our Plate. Unfortunately, like the Indian Roller, its voice is not in harmony with its plumage, its call, which is often uttered on the wing, being a loud harsh scream. Like the Roller also, it is rather a noisy bird.

Like all Woodpeckers, it is an extremely skilful climber, seldom or never perching crosswise on a branch but clinging, always with the tail downward, to the stems and branches of trees, which it usually ascends and descends diagonally. The flight is undulating. It is seldom seen on the ground but occasionally descends to feed on ants which seem to form an appreciable proportion of its normal food, this consisting almost entirely of insects, largely ants, varied with numerous small beetles, caterpillars and bugs, to which buds

and fruits may occasionally be added. The late C. W. Mason examined the stomachs of sixteen birds throughout the year at Pusa and found 3,921 insects of which the great majority were ants, and it is notable that only one of these sixteen birds was found to contain longicorn beetle larvæ, although observation renders it certain that this bird does feed to some extent on wood-boring insects, which its long, worm-like, extensile tongue, armed with a many-barbed horny tip, is so admirably fitted to extract from their burrows after these have been laid open by the vigorous blows of the strong chisel-like beak. In Eastern Bengal it is stated to feed on the larvæ and pupæ of *Hoplocerambyx spinicornis*, a longicorn borer pest of *sal* (*Shorea robusta*), and in Madras it is stated to be very partial to toddy-palms, which may be due to the fact that these trees are infested by *Oryctes rhinoceros* and *Rhynchophorus ferrugineus*. At Pusa many of the dead *sissu* branches, at which one sees this woodpecker tapping away, are infested with a tree-living termite (*Coptotermes heimi*) and, although Mr. Mason's stomach records do not support this, it is probable that this termite may provide a certain proportion of its food. As is the case with so many



Golden-backed Woodpecker.

of our common Indian birds, it is wonderful how little we really know about its daily life. However, from the little we do know, we are justified in counting the Golden-backed Woodpecker, with all its kindred, amongst the farmer's friends.

Like other Woodpeckers it nests in a hole in a tree, often in a mango tree in Northern India; in Bihar nests have been found in mango, litchi, *sissu* and *siris* trees. The Northern race has two breeding seasons from March to the end of April and from the middle of June to August, the Southern race has been found breeding in March; the Sind one in April; eggs of the Ceylon race have been taken in March and August and those of the Ceylon Red-backed Woodpecker in March and April and again in August and September. The courtship is of a rather rough and ready fashion, punctuated by harsh screams. The glossy white (delicate salmon-pink when fresh and unblown) eggs, four or five in number, though three and sometimes two only are incubated, measuring about 28 mm. long by 20·9 mm. broad, are laid in a hole excavated in a tree by the parents or more frequently in a natural cavity to which merely an entrance has been made by the birds. Dewar states that "Woodpeckers seem to excavate a new nest every year", but we are not aware how far this is the case. Woodpeckers, however, are very apt to desert any nest-hole that has been interfered with at all. We have many times found them to do this even when no chipping was done to enlarge the hole, the only interference being by means of a thin twig. Sometimes also they only partly excavate a hole and then leave it for another site. The nest-hole is about two and a half to three and a half inches in diameter and usually runs in horizontally for about three to six inches and then turns downwards. When the downward shaft is bored by the bird it is rarely more than eight or nine inches deep with a chamber of some five or six inches in diameter, but when the bird cuts into a natural cavity in the tree the egg may be found two or three feet

below the entrance. No regular nest is formed, the eggs being laid on a few chips of wood. The young, when first hatched, are naked but assume the sexual coloration with the first feathers. If caught young, they may be trained to a diet of "*sattoo*" with some soft fruit and occasionally some insects.

In Bengal, Burma, Madras, Bombay and Assam this bird is protected by law throughout the whole year.

THE GREEN BARBET

(*Thereiceryx zeylanicus*)

ALTHOUGH common enough where it occurs, the Green Barbet is not found in the less wooded areas of the country, such as the Punjab and Sind, Rajputana, and the more open parts of the Deccan and Carnatic. In areas where it does occur, however, it is sufficiently a common bird to merit inclusion in our list, especially as its call is probably more familiar than its personal appearance. It is a thick-set bird, about as large as a myna, with a thick, heavy bill, in colour of a bright leaf-green with a brownish head and a bare orange-yellow patch around the eye ; but, as it always keeps near the tree-tops, it is less often seen than heard. Sometimes it may be seen on the wing, when its flight is strong but rather heavy and undulating. Its call is loud and monotonous, but by no means harsh or discordant, and is usually written *tur-r-r-r, kutur, kutur, kutur,* the call being indicated in the various vernacular names, such as *Kotur* (Hindustani), *Kuturga* (Mahratti), *Kotoruwa* (Sinhalese) and *Kutur* (Tamil). The call often sounds much like the word *Pakrao,* repeated several times.

Like most other birds, however, this Barbet is not confined to the use of a single note. In this connection Mr. Stuart-Baker, in his " Birds of North Cachar ", writing about a very similar and closely allied bird, the Assam Lineated Barbet (*Thereiceryx lineatus hodgsoni*), makes the following interesting remarks : " I have heard this bird libelled as being a bird of one note; now any one who has listened to it *carefully* must admit that it has many. Whilst

feeding, it has a large variety of sounds at its disposal. When pleased, it utters a sort of hoarse 'chortle'; but, to make this sound, it seems to be necessary to be on the move, for it always utters it when hopping from one branch to another, or else it gives a little jerk into the air at the same time that it opens its mouth to give vent to its feelings. Displeasure, which seems to be caused chiefly by seeing other birds feeding with it, is expressed by a ridiculously feeble little sound like 'pench, pench', the feebleness being made up for, to some extent, by the bird's ferocious attitude as he advances, with drooping wings and mouth wide open, towards the object of his displeasure. The most unusual note is one it makes use of only in the cold weather, at which time these birds sometimes collect in small flocks, and only in the mornings and evenings, seemingly for the purpose of collecting any scattered individuals. It consists of a loud clear whistle, a most wild and penetrating sound, but at the same time rather musical than otherwise. It is an abnormal sort of a sound for a barbet to give utterance to and had I not followed up and shot some of these birds whilst actually whistling thus, I should never have imagined what had made the sound". The Green Barbet may sometimes be heard calling at night, especially on moonlit nights.

Like other Indian Barbets, this bird lives chiefly on fruit. The late Mr. C. W. Mason examined the stomachs of fifteen birds at Pusa and found nothing but wild fig fruits in them. It is very fond of *Lantana* berries and helps to distribute the seeds of this noxious weed. This bird, however, has a curious habit of pulling off bits of bark from trees, especially from dead branches, as if searching for insects, and Blanford states that it is said occasionally, though rarely, to eat insects. Insects, however, evidently form a very small part of its diet and from an economic point of view this bird cannot be claimed as useful.

Blanford states that the characteristic "call is heard from January or February till June", and Dewar also says that this is heard "during the latter part of the cold weather and the early part of the hot weather". Where the bird is common, however, the call may be heard throughout the year, although more persistently during the first half of the year. During the rains, one of these birds may often be heard calling softly, as if talking to itself, and occasionally one or more birds give utterance to the usual loud call. As I write these lines (8th November) a Green Barbet is calling at intervals in a nearby tree.

Nesting takes place in a hole in a soft-wooded tree, usually in a dead branch or main stem, excavated by the bird itself, for which purpose its heavy bill seems well adapted.

The nest-hole is rather small, about five inches in diameter, and the passage leading into it is about six inches to two feet long, about two and a half inches in diameter, and very smoothly rounded off inside and bevelled off at the entrance, which is often situated on the underside of a branch and which in any case is always so placed that it does not face upwards, thus avoiding flooding of the nest-hole by rain. The nest is usually placed fairly high up in a tree, twenty feet or more above the ground, but may occasionally be found lower down. No regular nest is constructed, the eggs being placed on a few chips of wood in the nest-hole. When nesting, the birds are very shy about approaching or leaving the nest-hole whilst they are under observation.

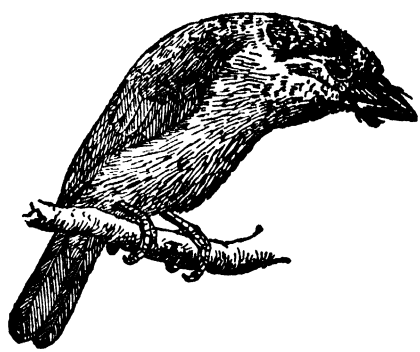
In Bihar the nesting season is chiefly in March and April, but further North eggs may be found in May or even in June. The eggs, which are dull white, and slightly glossy, measure about 30 mm. by 22 mm., and three or four eggs are usually laid.

This species is now divided into three sub-species, the typical form (*T. zeylanicus zeylanicus*) being found in Ceylon and South Travancore, it is the most richly coloured race, the form found along the West coast of India from North Travancore to Bombay being *T. z. inornatus*, in which the colour is paler, the brown more extensive, and the streaks on the breast very faint, and that found in Northern India, from the extreme west to Western Bengal, being *T. z. caniceps*, which is duller and paler than the typical race and the streaks not as bold though bolder than in *inornatus*. It is this last sub-species which is represented in our Plate.

Here we may mention the Small Green Barbet (*Thereiceryx viridis*) as it so frequently frequents gardens in Southern India. It is like a small edition of the other Green Barbets and is found, according to Mr. Stuart-Baker, in "the Hill Ranges from South Travancore to Mahableshwar, Belgaum and Deccan". It occurs from plains level up to 8,000 feet or more. We have, elsewhere (*Birds of Southern India*), remarked about this species. "It frequents the more open sholas and gardens which have large shady trees, and like its cousin of the Plains the Crimson-breasted Barbet is very noisy, giving vent to its loud cries (which consist of two distinct calls—one a prolonged *Kr-r-r-r*, like the winding up of a gigantic clock and not unlike the commencement of the call of the Gecko which is so common in Burma, followed by *Ruku-ruku-ruku* repeated several times; the other a loud *Hook-krr Hook-krr* also repeated several times) from morning to night and the whole year round, especially on fine, sunny days; when one bird begins, all the others within hearing seem to take up the same refrain, so that the country around appears to be full of nothing but these Barbets. Its food consists of berries and fruit and it is especially fond of apples which it will boldly rob from orchards". They breed from February to June and usually lay three eggs but two

or four are also sometimes laid ; they resemble those of the other Green Barbets but are smaller.

Another Barbet, which occurs along the lower ranges of the Himalayas and down to the south of Burma and which may often be seen in Calcutta, is the Bengal Blue-throated Barbet (*Cyanops asiatica asiatica*) which is a green bird, as large as a myna, with sky-blue patches on the cheeks and throat. Its call consists of a long series of thrilling notes, usually " Kŭrrăwŭk, Kŭrrăwŭk. . . . " but sometimes " Kūkărrŭk, Kūkărrŭk. . . .", preceded by a number of low, clucking notes. Although it prefers forest country it comes into many gardens. Besides feeding largely on fruit it also eats soft insects and Mr. Stuart-Baker has taken a centipede from the stomach of one. Like the Green Barbet, this bird nests in a hole which it excavates in a dead stump or branch of a tree.



The Bengal Blue-throated Barbet.

THE CRIMSON-BREASTED BARBET OR COPPERSMITH

(*Xantholæma hæmacephala*)

ON the very hottest day of the year, when the brazen sky compels every animal to take advantage of any piece of grateful shade and the loquacity of even the crow is stilled, a soft, liquid, monotonous and sustained "tonk-tonk-tonk" gives evidence that the Coppersmith does not find the heat too enervating for song. Its note, which may be compared to the distant sound of a smith beating a sheet of metal, whence its popular name of Coppersmith, is sufficiently familiar during the hot weather in almost every garden throughout the Plains of India, but to most of those who hear its call it is indeed a case of "*vox et præterea nihil*", the owner of the voice being rarely observed unless especially looked for. Not that its appearance is anything to be ashamed of; on the contrary, it is a most gorgeously coloured little bird, dressed in green and crimson, the details of which will be seen on reference to our Plate.

The Coppersmith is usually referred to in books on birds as the Crimson-breasted Barbet and, as this name implies, belongs to the family of Barbets, which comprises some twenty-five species and sub-species of smallish, thick-set, green, fruit-eating birds, with a short strong bill, rounded wings and ten tail-feathers. We have already dealt with this group in connection with the Common Green Barbet (*Thereiceryx zeylanicus*) and the Coppersmith may be distinguished by its yellow throat and blackish cheeks from the other species of *Xantholæma*, which are themselves separated

from the other Barbets by the second primary being longer than the eighth, the lower tail-coverts green and the rictal bristles long. We will just mention that there are two races of the Crimson-breasted Barbet, the Burmese race (*Xantholæma hæmacephala indica*) which is found to the east in Eastern Bengal, Assam, Nepal, Sikkim Terai and Burma, it is more richly coloured than the one in our Plate which is the Indian race (*Xantholæma hæmacephala lutea*) being found practically everywhere else but is said to be rare in the Punjab, Sind and Cutch as also in the dampest areas of the West Coast of India and Ceylon; it only differs in having the stripes on the lower plumage greyer in colour, those in the Burmese race being "dark sage-green".

There are two other species of this genus, the Crimson-throated Barbet (*Xantholæma malabarica*), its range is given by Mr. Stuart-Baker as "from South Travancore to Ratnagiri, east to Mysore, Wynaad and Palni Hills", as its name implies it may be recognized by its crimson throat; the Small Ceylon Barbet (*Xantholæma rubricapilla*), confined to Ceylon, differs from the Indian races in having the throat orange and the cheek blue instead of blackish.

In his fascinating book *Some Indian Birds and Acquaintances*, Cunningham has an excellent account of the Coppersmith, too long to quote in full, but from which we take the following extract:— "Coppersmiths are odd little birds, and most fully characteristic of the group to which they belong in their gaudy colouring, harsh, dry plumage, wonderfully tough skin, and insistent vociferation. During periods of settled, sunny weather, the only thing that seems effectually to check their desire to call is a certain degree of cold, but this is so influential that during the course of the variable winter in Calcutta it may safely be assumed that the temperature in the shade stands at or over 70°F. on any day when their call is to be heard. As the thermometer rises above the prohibitive limit they

begin to call more and more frequently until in the height of summer the monotonously metallic ringing of their notes goes on, almost constantly, from dawn to sunset. When preparing to call they usually take up a prominent place in the crown of a tree, often clinging to the side of an upright twig; and all the time that they cry they go on constantly turning their heads from side to side whilst their throats swell and their whole bodies thrill with the force of their vocal efforts. The movements of the head give rise to a strangely ventriloquial effect, so that the successive sounds might readily be mistaken for the answering notes of two birds instead of the continuous call of one. Towards the end of the hot weather, and during the early part of the rainy season, they cease to cry so incessantly, because the care of their young families takes up too much time to leave them much leisure for any other occupation". To some people the monotonous note, repeated indefinitely like the tick of a clock, is a source of exasperation until they are ready to exclaim with the apostle, "Alexander the Coppersmith hath wrought me much evil", and in some parts of India which are not cursed with the ear-splitting shrieks of the Hawk-Cuckoo, the latter's name of "Brain-fever Bird" is even at times misapplied to the Coppersmith; but to most people their song is soothing and it is at least constant and consistent and devoid of the exasperating quality of intermittence found in the true Brain-fever Bird.

Like other Barbets, the Coppersmith is a frugivorous bird and seems to confine itself entirely to wild fig fruits, not being known to attack cultivated fruits at all.* The late Mr. C. W. Mason examined the stomach contents of fifteen birds at Pusa

* Mr. C. M. Inglis, however, writes that prior to painting the Plate he carefully studied the bird so as to try to obtain a natural position, and one morning, whilst watching several of them on a guava tree in fruit, he saw them eating voraciously, digging out huge holes in the ripe fruit. There were about half a dozen birds hard at it at the same time and they played havoc with the tree. Mr. Inglis has also seen these birds sometimes hawking for termites. [T. B. F.]

and Mr. D'Abreu those of two more at Nagpur, and in all cases nothing but *Ficus* fruits was found to have been eaten. From an agricultural point of view, therefore, this bird is of neutral value.

The nesting season is in the early part of the hot weather, from March to May in Northern India, earlier in Central and Southern India. The nest, if such a term may be used, is placed at the end of a long gallery, which may be from one to five feet in length, either excavated by the parent birds in sound though soft wood of a branch, or more frequently in a branch which is already decayed internally and into which the birds cut, through the harder external shell of the branch, a perfectly circular hole with the edges neatly bevelled off inside and outside, this hole being about two inches in diameter and always placed on the underside of the bough. If a ready-made hollow is available it is preferred and appropriated, but if the birds have to excavate a new gallery on their own account, they usually choose a place on the under surface of a slanting dead bough, especially at a point where a side branch has been broken off and the wood softened by the invasion of fungal mycelium. Whilst working, the bird clings to the bark like a Woodpecker, with the end of its tail pressed closely against the surface, so as to serve as an additional support whilst it hammers and picks away with its bill at the soft wood, the chips of wood being sometimes hammered directly off but oftener merely loosened by a series of blows and then picked up and thrown away. Both of the parent birds take part in the work of excavation and they can sometimes be heard excavating their holes long after sundown. The eggs are placed at the bottom of the cavity into which they have thus bored, and which they smoothen a good deal interiorly, often a couple of feet below the entrance, and laid merely on the chips produced in the course of the work. Three or (more frequently) four eggs are laid, the egg being on an average 25 mm. long by 17·5 mm. broad, delicate pink when fresh, pure white later, almost cylindrical,

tapering somewhat towards one end, but with the ends themselves broad and obtuse. The young birds are much like the adult, but duller in colour and without the crimson and black markings on the head. Occasionally specimens occur in which the green plumage of the adult bird is replaced by yellowish.

The Coppersmith, we regret to say, seems rather an ill-natured little bird and is therefore not adapted to be a desirable inmate of a mixed aviary. He is not social with other birds rather than actively aggressive, but requires plenty of space and must be fed on his natural fruit diet, as *sattu* (pea-meal paste), although eagerly devoured by this bird, is rapidly poisonous to it.

THE COMMON HAWK-CUCKOO OR BRAIN-FEVER BIRD

(*Hierococcyx varius*)

THE common name "Hawk-Cuckoo" conveys a good description of this bird, as it is really a Cuckoo which looks very like a hawk. It is about the size of a Myna, but with a longer tail, greyish-brown in colour, whitish beneath, the breast tinged with pink, each feather with darker cross-bars, eyes and legs brilliant yellow. When on the wing, it looks very much like a small hawk but, when it alights, it at once assumes a slouching, cuckoo-like attitude, with the wings dropped forward so as to touch the perch and the tail slightly raised and expanded, thus presenting an aspect very different from the compact and alert look of a hawk. Seen thus, at rest, this bird can hardly be mistaken for a true hawk, as it has the furtive, peering ways of common Cuckoos, constantly jerking itself from side to side and puffing out its throat.

The appearance of the Hawk-Cuckoo is probably less familiar to most people than is its note, which has aptly earned for it the notorious title of the "Brain-fever Bird". Our Indian gardens and groves contain many sweet-voiced singers amongst their avian denizens and a few whose voices are less grateful to the ear, but there is not one whose notes consist of such ear-splitting and nerve-racking cries as do those of the Brain-fever Bird. With the most annoying persistence and reiteration this bird repeats its cry, which bears a remarkable resemblance to the word "brain-fever" repeated in a piercing shriek running up the scale. The cry may also be

written as "Pipiha" and in some districts the vernacular name of the bird is given as *Pupiya*. Another rendering of the call, which includes the overture preceding the triple note, is, "O lor'! O lor'! how very hot it's getting– we feel it, *we feel it*, WE FEEL IT".



Head and foot of Common Hawk-Cuckoo (*Hierococcyx varius*).

The call is extremely loud and shrill and can be heard—indeed, it cannot but be heard—within a radius of several hundred yards, but one of the most annoying things about it is its intermittent character. The human ear soon becomes accustomed to any

continuous and uniform kind of noise. One becomes so accustomed to the buzz of a dynamo that one awakens at once if it stops. The Coppersmith *tonk-tonking* in the garden all day is hardly heard consciously unless one listens for it. But the shrieks of the Brain-fever Bird burst their way without ceremony into one's inner consciousness, whether awake or asleep, and one cannot help but hear them. "We feel it, *we feel it*, WE FEEL IT" go the cries, up and up the scale, and then suddenly stop, and one hopes fervently that this fiend in bird's plumage has burst its throat or at least flown away out of earshot. But no; after a short interval it begins again and may continue for hours at a stretch. Very often the performance commences just at dusk, when it has got too dark to make out the culprit, and lasts all night without intermission. When this sort of thing takes place on a really hot night, the victim, who is attempting to woo sleep after a hard day's work, may well be excused if the first dim dawn sees him sallying forth on vengeance bent. But vengeance is not always easy to attain. The bird usually perches high up in a tall tree and keeps so still and is so inconspicuously coloured that, even when its shrieks locate the very branch whereon it is sitting, it is not always easy to make out. Furthermore, it is wary and often flies off as soon as it sees that it has been detected. There are, however, usually only a few individuals in each locality and a comparatively small reduction in numbers works wonders in abating the nuisance. The call being very penetrating, it often happens that these birds call to one another across a distance of perhaps half a mile and, by shooting one bird forming a link in the chain between others on either side of it, the chain is broken, and a blessed peace reigns once more, at least until another bird invades the immediate neighbourhood. In Bihar the call of this bird coincides with the approach and duration of the hot, dry weather before the Monsoon; occasionally it may be heard as early as in December but more usually commences about February and is continued, becoming more frequent and continuous, until the

rains break, when there is a welcome cessation for a few months. In other districts this may not be so; thus, as regards Calcutta, Cunningham states that "there is hardly any season at which their characteristic notes may not occasionally be heard; but, as a rule, it is during the rainy months that they are most frequent, so that the designation 'hot-weather bird', that is often applied to the species in other parts of the country, is hardly applicable to it in Calcutta".

According to Mr. Stuart-Baker, this Hawk-Cuckoo occurs throughout the whole of India and Ceylon, except Sind and the Punjab; extending eastwards to Eastern Bengal and to Kamrup and Goalpara in Assam; but, although odd examples may occur throughout this area, its range as a common bird seems to be more restricted. It is extremely common in the United Provinces and Bihar. Dewar notes that he never heard it in Madras, nor did I ever hear it during my residence in Coimbatore, and it is apparently quite absent in the island of Bombay. In some districts in which it is absent, or at least scarce, this Hawk-Cuckoo is frequently confounded with the Koel and the name "Brain-fever Bird" given to the latter. As Dewar puts it, "There is certainly some excuse for the mistake, for both are Cuckoos and both are exceedingly noisy creatures; but the cry of the Koel bears to that of the Brain-fever Bird or Hawk-Cuckoo much the same relation as the melody of the organ-grinder does to that of a full German band. Most men are willing to offer either the solitary Italian or the Teutonic gang a penny to go into the next street, but, if forced to choose between them, select the organ-grinder as the lesser of the two evils. In the same way, most people find the fluty note of the Koel less obnoxious than the shriek of the Hawk-Cuckoo".

In spite of its obnoxious vocal efforts, the Hawk-Cuckoo does some little good by feeding on injurious insects, although when it

can find time to hunt these out in the height of the hot weather, when it seems to be calling continuously day and night, always seems somewhat of a mystery. Like other Cuckoos, it eats hairy caterpillars, whose defensive armament protects them from the attacks of most other birds, and it also eats other caterpillars, crickets, grasshoppers, bugs and beetles. The diet is a mixed one, comprising buds and fruits, particularly wild fig fruits, as well as insects. It is presumably on account of this redeeming feature that this bird is protected in Delhi, the United Provinces, Bengal and Assam.

Like other Cuckoos, the Brain-fever Bird economizes in house-keeping, building no nest of its own but placing its eggs in the nests of other birds, usually the "Seven Sisters" or some allied species of Babblers, the breeding season lasting from April until June. The eggs are deep blue in colour and measure about 26 mm. by 20 mm., and are about the same size and shape as those of the foster-parents. The Babbler's eggs are wholly blue, very glossy, hard-shelled and broad, blunt ovals in shape; the Hawk-Cuckoo's eggs are very similar in colour but with a softer, more satiny surface, less glossy and with much thicker shells, in shape rather more spherical or elliptical and slightly larger than in the Babblers. When lying side by side in the nest, however, the eggs of the Babbler and of the parasitic Cuckoo are often practically indistinguishable.

The manner in which Cuckoos' eggs are deposited in the nests of other birds is one which has engaged a great deal of attention. Some say that the eggs are *always* laid in the normal way in the nest of the birds selected as foster-parents; the method being as follows:—As soon as the hen Cuckoo is ready to lay her egg she goes to the desired nest where she picks up one of the fosterer's egg in her bill and deposits her own egg in its place afterwards

flying off with the fosterer's egg still in her bill; this is to show why it is that Cuckoos *are* seen with eggs in their bills; but it is not always possible for the hen Cuckoo to lay her egg direct into the nest such as when the egg has to be dropped into a hole; in such cases the Cuckoo *must* lay her egg on the ground, then pick it up in her bill and drop it into the desired nest.) We are of opinion that *both* methods are used but that the second one is the normal one. The thick texture of the cuckoo egg-shell seems to be specially adapted to this end as, in cases where the nest is placed inside a hole, the egg may have to be dropped into it from a little height. In the case of the Hawk-Cuckoo, it is possible that its hawk-like appearance on the wing may be advantageous in securing a clear field for depositing an egg in this way in the nest of the Seven Sisters,) as one observer states that the whole sisterhood make themselves scarce when the Hawk-Cuckoo appears on the scene, and thus give her a fair field for planting her oval imposition on them. Our Plate shows a Hawk-Cuckoo, with an egg in her bill, about to be dropped into the nest of one of these Babblers. It may be added that further observations, on the method of egg deposition employed by this and other Indian Cuckoos, are very desirable.

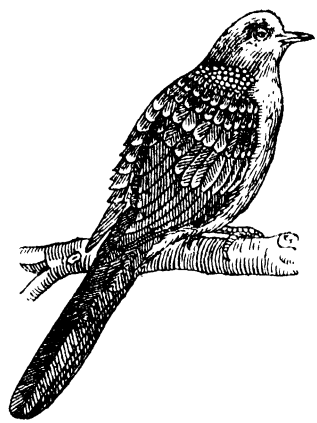
That well-known ornithologist Mr. Stuart-Baker, who has an unrivalled knowledge of the Cuckoos, is fortunately writing a book on them.

The only other Hawk-Cuckoo that is at all familiar is the Large Hawk-Cuckoo (*Hierococcyx sparveroides*); it takes the place of the Common Hawk-Cuckoo in the hills. It is a large bird about 15 inches long with a brown back, the throat and foreneck white or grey streaked with dark ashy, the upper breast more rufous and rest of lower plumage white barred with brown. It is more of a forest bird than its common cousin and also is less noisy. It is found in the Himalayas from Kumaon to Assam and in the hills

of Southern India, being common in the Nilgiris, and is also found in Burma and Malay States.)

(It breeds between 3,000 and 9,000 feet laying its eggs in the nests of various Laughing-Thrushes and Large Spider-Hunters.)

The Hawk-Cuckoo is known vernacularly as *Kupak* and *Pupiya* in Hindi-speaking districts, as *Chok-gallo* in Bengal, as *Zakkhat* in the Deccan, as *Irolan* in Malayalam and as *Kutti-pitta* in Telugu districts.



Spotted Dove.

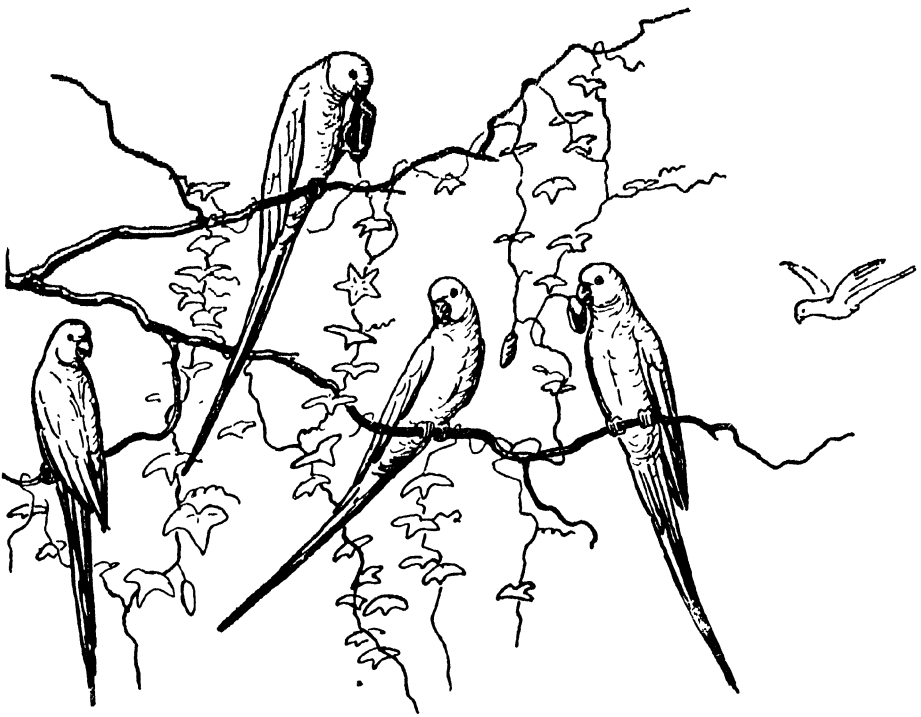
THE ROSE-RINGED PAROQUET

(Psittacula krameri)

THE great family of the Parrots is so widely distributed throughout the Tropical Regions of the World and is composed of so many different species that it is difficult to say why the Indian list of indigenous forms should be so scanty, only eleven species, represented by twenty sub-species, being known to occur. But perhaps it is well that we have no more; for, as Dewar remarks, "the green parrot is one of those good things of which it is possible to have too much".

Parrots are sharply distinguished from all other classes of birds by several anatomical peculiarities in their vertebræ, feet, and other parts, into which we need not enter here. Most Indian Parrots are easily recognizable as such, their most obvious characters being the short, stout, strongly-hooked bill, thick fleshy tongue, movable upper mandible, climbing habits, and (in most species) long tail and greenish colour. The subject of our present article may be distinguished from all other Indian Parrots by its long tail, head (except chin and mandibular stripe in males) and body green, bill deep red, with the lower mandible nearly black, with no red patch on the wing-coverts. It is by far the commonest and most familiar of the green Indian Parrots, occurring abundantly in all open and cultivated land around towns and villages, often in large flocks, dashing over the tree-tops in swift, arrowlike flight. It is found practically everywhere throughout the Plains of India, and in Ceylon, but seems to be commoner in Northern India than in Madras. Another race, the Eastern Rose-ringed Paroquet

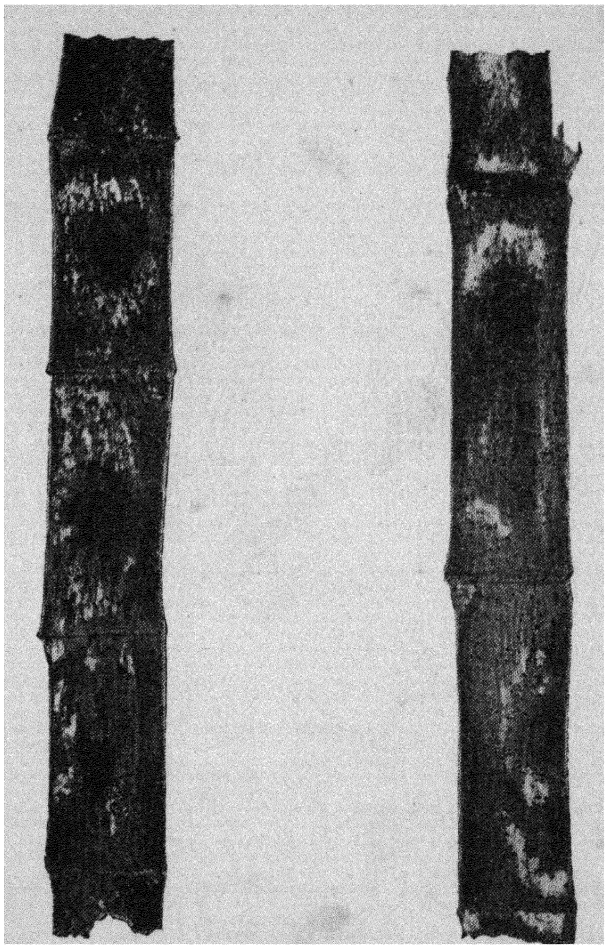
(*Psittacula krameri manillensis*), is found, according to Mr. Stuart-Baker, in "Sikkim to the extreme east and south of Assam; Eastern Bengal; Northern and Southern Burma, south to Pegu; Shan States"; it only differs from the other race in having the *whole* of the bill red; it is said to be not as common a bird as the better known race nor to occur in such large numbers.



Rose-ringed Paroquets attacking wild fruits.

Wherever it occurs, however, in its wild state the Rose-ringed Paroquet is an unmitigated nuisance, as its diet is wholly vegetarian and it feeds largely on cultivated grains and fruits. When a large flock descends on a ripening crop of *juar* (sorghum) or similar cereal, a great deal of damage is done, some by the actual grain that is eaten, but far more by the extremely wasteful method of feeding

of this bird, which often breaks off a whole head, delicately selects one or two grains, throws away the rest, and breaks off another head which is treated in the same way. When fruits are



Sugarcane damaged by Parrots in Assam (from a photograph by Dr. C. A. Barber).

ripe, these birds soon find them out and play havoc with them. When no cultivated fruits or crops are in season, the food consists of wild fruits (wild figs, *Zizyphus*, etc.) and seeds. The late Mr. C. W. Mason examined fifty-three birds at Pusa and

Mr. D'Abreu three more at Nagpur, and in all cases the stomach contents consisted entirely of vegetable matter—mustard, wheat, maize, paddy, litchi and wild fruits, and seeds of *Dalbergia sissu*. When the silk-cotton trees are in flower in February these parrots are amongst the crowd of birds which congregate to imbibe the nectar. We have not yet had any complaints of its attacking sugarcane but, with the increasing cultivation of this crop in Bihar, it will perhaps discover that it is edible and attack it in the same way as another Parrot has damaged sugarcane in Assam, by gnawing large holes in the stems.

The Rose-ringed Paroquet does not deserve, nor has it been afforded, any protection under the Wild Animals Protection Act: on the contrary, its destruction should be encouraged and, if this could be done by exempting the export of its plumage from the present Customs restrictions, or in any other way, it would be all to the benefit of the cultivator who is practically powerless at present to prevent the immense damage done to his crops by this destructive bird.

It must be admitted, however, that from a purely æsthetic and non-utilitarian view-point the Rose-ringed Paroquet is a decidedly handsome and attractive bird when seen under natural conditions flashing through the sunshine or climbing over a tree in search of food, and, in places where its numbers are but small, its brilliant hues, delicate outlines and dainty ways provide a perennial source of joy to the bird lover. But in country districts, where it is only too abundant, its destructive habits and shrill harsh screams very quickly nullify such feelings of admiration.

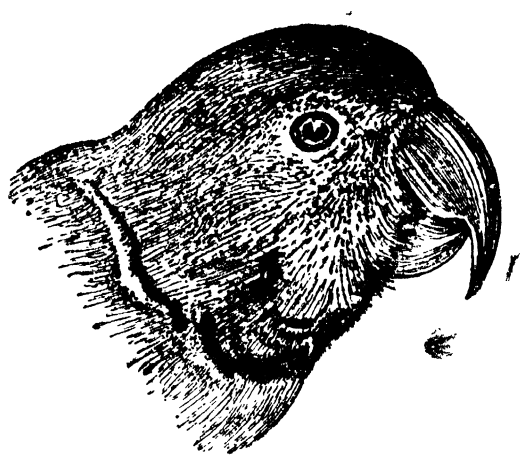
As a cage-bird the Rose-ringed Paroquet is a favourite all over India, and thousands of young birds must be taken every year from their nests and doomed to pass the remainder of their existence

within prison bars, although unfortunately this annual toll seems to make little difference to the total numbers which exist to ravage the farmer's crops. As its powerful beak soon secures its escape from a wooden cage, this bird is usually kept in a small dome-shaped cage made of hoop-iron, with a sheet-iron floor, which must get uncomfortably like an oven in the hot weather. With a little instruction, this parrot often becomes a good talker, and it can also be taught to perform tricks. Lockwood Kipling tells of one that he used to see in the streets of Delhi " that went through gymnastic and military exercises, whirling a tiny torch lighted at each end, loading and firing a small cannon, lying dead and coming to life again ; all done with a comic air of eagerness and enjoyment which it seemed hard to impute to mere hunger for the morsels that rewarded each trick ".

The Rose-ringed Paroquet breeds in January and February in Southern India, from March to May further North. No regular nest is made but the eggs are laid in a branch of a tree, occasionally in a wall. If a suitable hole is already available, the birds appropriate it, and couples may often be seen, at Pusa about the end of February every year, inspecting eligible sites, which by that time are often occupied by Hoopoes. If no acceptable hole can be found, the birds may excavate one for themselves and Colonel Butler noted a pair at Deesa which were at work clearing out the hole, in which the eggs were subsequently deposited, for at least three months before the eggs were laid. A finished hole, either acquired or excavated either wholly or in part, is generally about two inches in diameter, and goes straight into the trunk for two to four inches and then turns downward for a distance of six inches to three feet, the lower portion being expanded into an egg-chamber which is four or five inches in diameter. Should a natural hollow in the tree be utilized or cut into, the chamber may be much larger. The entrance hole is cut either into the trunk of a tree or into a

large bough ; in the latter case it is often placed on the lower side of the bough. No lining is provided, the eggs being laid on a few chips of wood at the bottom of the hole. The usual number of eggs is four but as many as six are found at times. The egg is pure white, without any gloss, usually in shape a moderately broad oval, considerably pointed towards one end, and measures about 30 mm. by 24 mm.

Our Plate shows both sexes of this Paroquet, the adult male being distinguishable by his rosy collar which is absent in the female.



Head of male Rose-ringed Paroquet.

THE ROLLER

(*Coracias benghalensis*)

THE Roller or Blue Jay (*Coracias benghalensis*) is one of the birds of the Plains which must have brought itself to the notice of all if merely on account of its vivid colouring, which has been aptly described as a study in Oxford and Cambridge blue. Although commonly called a Jay, this bird is more nearly allied to the Bee-eaters and Kingfishers, its relationship to the latter group being evidenced, as recorded by Gordon Dalgliesh, by the fact that it has been seen to plunge into the water like a Kingfisher, this most unusual occurrence indicating an affinity to the Kingfisher in habits, especially to the White-breasted species which is practically an insect-feeder. As a matter of fact, *C. benghalensis* belongs to the group of Rollers, so called because of the extraordinary aerial gymnastics indulged in by these birds, as may be seen especially during the early part of the hot weather, when courtship takes place.

This species occurs throughout the Plains of India and Ceylon, neither ascending the hills nor occurring in areas of desert or thick jungle. The form found throughout Northern India to Eastern Bengal is the Indian Roller (*C. benghalensis benghalensis*), which is replaced in Southern India and Ceylon by the Southern Indian Roller (*C. benghalensis indica*). Both races are very alike, the Southern one being smaller and the colour of the collar on the hind-neck is deeper and more purple. Calcutta seems to be about the eastern limit of occurrence of the northern sub-species, which

east of that is replaced by the Burmese sub-species, *Coracias benghalensis affinis*, which is slightly larger and much darker, with a lighter tail which lacks the purple band at the tip which sets off so well the tail of the Indian Roller. In the Duars both species have been got and where they meet they hybridize freely. In Northern India another species, the Kashmir Roller, *Coracias garrula semenowi*, a local race of *C. garrula*, which is found in Africa and Europe, also occurs and may be distinguished by its lower parts being pale-blue throughout, whereas in the Indian and Burmese Rollers, the lower parts are only blue in part. There is also a forest species, *Eurystomus orientalis orientalis*, the Broad-billed Roller, with a red bill and legs ; this is a rather silent bird and exceedingly wary and frequently nests in non-accessible holes in large *Simul* (*Bombax malabaricum*) trees. This is essentially a forest bird wherever found.

There are two races, the typical one just mentioned, which is found " all along the foothills of the Himalayas from Kumaon to Eastern Bengal and Assam, also Burma, the Wynaad to Travancore and Ceylon " and the Andaman one (*Eurystomus orientalis gigas*) which is confined to that island and only differs from the typical race in having a much larger bill and averaging rather bigger.

Where it does occur, the Indian Roller is usually found commonly and is not a bird which can be overlooked when on the wing, as its brilliant blue colours are then displayed to advantage. When at rest upon a branch or telegraph wire, however, this bird is by no means conspicuous, as the wings are then closed and the colours are not very evident. From the sudden contrast between the inconspicuous hues of this bird when at rest and the vivid display of colour evidenced when it takes to wing, it is sometimes known as the " Surprise Bird ". Its usual habit is to sit on any convenient perch and watch patiently until some desirable prey comes into

sight, when it flies down, secures its quarry, which is always swallowed whole, and returns to its perch. Ordinarily it appears to be a decidedly sluggish bird, sitting for hours on the same perch, occasionally jerking its tail and emitting a sharp harsh " Tjock ". The extremely inconspicuous appearance of this bird when at rest provides concealment at once from enemies and from prey and the Roller seems to be well aware of this fact, as, if it has no reason to suppose itself to have been noticed, it will often permit very close approach, remaining quite motionless on its perch. To a potential enemy, which discovers it at close quarters, the sudden exhibition of its brilliant colouring must have a startling effect.

At the breeding season, which occurs in Bihar from March to the end of June, and as early as January in Ceylon, these birds, however, become more active and vociferous, their harsh, staccato gutturals being evidently pleasing to the opposite sex. It is at this time also that they indulge in the weird evolutions which have earned these birds the title of Rollers. As both sexes wear the same livery it is difficult to tell which is which, but two birds may often be seen sitting side by side on some exposed perch during the breeding season and uttering a sort of chuckling sound. One of them, presumably the cock bird, then flies off and up into the air to a considerable height whence he descends in a regular " nose-glide ", displaying his vivid colours and uttering short harsh screams all the while, ultimately returning to perch beside his mate.

The nest is placed in a hole in a tree or building and is generally lined with a varying amount of vegetable fibre, grass, a few feathers, or some old rags, but the lining is often omitted altogether. Four, or sometimes five, glossy-white eggs are laid. The young are quite naked at first, but, later on, when the feathers have grown, are marked with vivid blue like their parents. Mr. Aitken considered the parent birds very wary and the nests difficult to discover, but

in Bihar at any rate this is not the case, it being one of the easiest nests to find, the birds continually chasing away any intruders that come near the nesting site.

Besides being, as the poet puts it, "a lovely bird with azure wings", and thus an ornament to any landscape, the Indian Roller is an extremely useful bird, as its food consists almost entirely of large insects, such as grasshoppers, crickets and beetles, varied by an occasional small mouse, frog or snake. One kept by Mr. Finn even digested a toad, which must have been a very "tasty" morsel. The late Mr. C. W. Mason examined the stomachs of eighteen birds between January and October at Pusa and found that, of 412 insects taken by these birds, only 4 were beneficial, 111 were injurious and 297 neutral. Of the injurious insects taken 52 were grasshoppers, 18 crickets and 23 caterpillars, mostly cut-worms, so that the good done by the destruction of these injurious insects far more than counterbalances the fact that a very few beneficial insects were taken.

Towards the end of the rains, when the big brown crickets emerge at dusk from their holes in the soil, the Roller is well aware of their habits and may be seen, until night has almost fallen, perched on a convenient bough and watching eagerly for the chance of a tasty supper, a happy chance which is accomplished should any unwary cricket wander far enough to enable it to be captured before it can regain the safe security of its burrow. There is in my garden a large *Dalbergia* tree with a dead branch which affords an excellent clear view of the ground beneath, and every evening at sunset a Roller takes up its post on this dead bough and watches until far into the dusk for the crickets which are foolish enough to leave their burrows in the lawn and flower-beds beneath this tree. The Little Owl, likewise fond of crickets for supper, also appears at the same time but, having the advantage of nocturnal

vision, is able to harry the crickets throughout the night as they forage for food. Like Owls also, the Roller throws up the undigested portion of his food in the form of pellets.

It is therefore unfortunate that the Roller's brilliant plumage should frequently lead to its being shot by Europeans, especially in the neighbourhood of military cantonments, for the sake of its wings. According to the late Mr. C. W. Mason, " being one of our common species of birds, and the gaudy colour very striking to any one new to the country, numbers of these birds are shot by Europeans in order to send one or two wings home, and they are sent home not declared, or falsely declared. From what I have seen, I do not imagine that more than one out of six pairs of wings ever sees the destination for which they were originally obtained. Some specimens are not good enough, while others are put away, forgotten, and eventually thrown away ". It should therefore be noted that the Indian Roller is protected, under the Wild Birds and Animals Protection Act, throughout the whole year in Bihar and Orissa and in Delhi. In view of its beneficial activities to the Indian *raiyat*, it is to be hoped that the numbers of this bird will not be allowed to diminish throughout the area of its occurrence.

This bird is sacred to Vishnu, who once assumed its form, and is caught to be liberated at the Hindu Dasahra festival in Western India and at the Durga Puja in Bengal. Finn states that " once at least a throne has been gained by the holy fowl—no doubt a trained specimen—alighting on the successful candidate's head ".

Falconers fly the Red-headed Merlin (*Falco chiquera chiquera*) at this bird. Jerdon says " it is often baulked by the extraordinary evolutions of the Roller who now darts off obliquely, then tumbles down perpendicularly, screaming all the time, and endeavouring to gain the shelter of the nearest tree or grove ".

THE GREEN BEE-EATER

(*Merops orientalis*)

THE Green Bee-eater is a small slenderly-built bird, of a bright green colour, with a rather long curved black beak and with the two middle tail-feathers projecting like bristles a couple of inches beyond the other tail-feathers ; the eye is bright red, the throat green or blue (whereby it is readily distinguished from the Blue-tailed Bee-eater with its chestnut throat), a black band under the eye and a black collar above the breast, some black in the tail, and the lower surface of the wings bronzy-red. It is easily recognizable and not likely to be confused with any other bird found commonly in the Plains. There are three sub-species, *Merops orientalis orientalis*, whose distribution is given as India, Bengal to Ceylon ; *M. orientalis birmanus*, the Burmese Green Bee-eater, found in Assam and Burma ; and *M. orientalis biludschicus*, the Sind Green Bee-eater, which ranges from South-East Persia to Sind and Baluchistan. These sub-species vary in the amount of red-gold about the head, this being wanting in the Sind birds and more pronounced in the Burmese race.

Cunningham, whom we have quoted so often, says of this bird :—" Common Bee-eaters are singularly alluring both in appearance and in the character of their notes. When seen from behind they look brilliantly green with golden gleams about their heads ; their wings have a ruddy bronze tint, and there is a beautiful patch of blue on the throat—a scheme of colour which, along with their brilliantly sparkling eyes, cheerful cries, and confiding familiarity, is well adapted to command general admiration ".

This Bee-eater occurs throughout India and is usually abundant when it occurs, but it seems to be a local migrant, moving to different localities in the hot and cold seasons, so that in some places it may be found only at one season and in other places, where it is seen all the year round, it is probable that the individuals seen (with the exception of a few remaining to breed) do not remain in that place all the year. There seems to be a regular movement of the species southward about September and northward again about March in every year. Thus, this bird is found in Madras in the cold weather but, with the exception of a few which remain throughout the year, most individuals move north about March. In Calcutta the annual immigration takes place about the second week of October and the exodus about March, as soon as the hot weather has set in. In North Bihar this Bee-eater appears in numbers about the beginning of October and again in February and March, these temporary accessions apparently indicating the passing through of a migrant stream southwards and northwards respectively. In the Punjab and North-West Province, this bird arrives about March and leaves again about September. It seems probable that this migration is due primarily to the necessity for moving away from localities in which the necessary insect-food is becoming scarce, but we really know very little about the underlying causes of migration in birds. Cunningham says, "Their departure can hardly be determined by dietetic causes, as other kinds of insectivorous birds continue to find an abundance of insect-food all through the summer. It is apparently due to their nesting habits, for, nesting as they do in burrows in the soil of fields and banks, in a region like the lower Gangetic delta, they must naturally meet with great difficulties in finding sites secure from repeated inundation during the torrential falls of rain that frequently take place during the summer months. Hence they move off to somewhat higher and dryer regions, and remain there until, with the colder and dryer days of autumn, insect-food becomes

inconveniently scarce, and they are once again driven back to milder and damper places". But the last sentence of this quotation seems to be in direct contradiction to the first, nor does Cunningham's theory fit the case of many parts of Madras, where the rainfall is practically all during the North-East Monsoon, in October and November. The fact seems to be that this Bee-eater prefers a dry, sunny climate, because such conditions are necessary for the capture of its prey which consists almost wholly of flying insects taken on the wing. Thus, it is not found in dense or damp forests and in Ceylon it only occurs in the drier parts of the low country.

The Green Bee-eater is a sprightly little bird with a loud but rather pleasant note. It is fond of resting on projecting boughs, railings, telegraph or other wires, or in any similar position affording a good view, whence a sharp look-out is kept for any insect seen moving on the wing, whereupon the bird projects itself into the air with a few quick strokes of the wings, then glides onwards with widely-spread wings and tail to secure its prey, and then usually returns to its perch to devour it. The snap of the beak with which the prey is caught is often audible from a distance of several yards. If the prey is small it may be swallowed at once, with a quick upward jerk of the beak, but if large or a stinging insect it is generally broken up a good deal by striking the lower mandible against the bird's perch; as these birds are usually very tame, it is often possible to watch this process at quite close quarters.

The food is composed exclusively of insects, in the broad sense of the word, and the largest proportion of it is composed of flying insects taken on the wing. Of these, bees and other Hymenoptera form the vast majority and this Bee-eater is a very serious pest in most localities in the Plains where apiculture is practised. Our apicultural experiments at Pusa have been largely brought to

a standstill, almost wholly on account of the activities of these Bee-eaters, practically all the newly-raised queen bees being snapped up by them whilst on their marriage flight. Dewar, in his *Birds of the Plains*, says, " I doubt whether the little *Merops viridis* tackles an insect so large as a bee ". Our records show most emphatically that this Bee-eater not only tackles bees but is a perfect pest of the apiary, destroying very large numbers of honey-bees of all sorts. We have found at Pusa that it eats *Apis florea* (the small honey-bee), *Apis indica* (the Indian honey-bee) and *Apis mellifera* (the European honey-bee), whilst Mr. D'Abreu found at Nagpur that this bird had even eaten *Apis dorsata* (the large rock honey-bee). Out of forty-three birds' stomachs examined at Pusa by the late Mr. C. W. Mason, of 376 insects taken no less than 300 (mostly bees) were classed as beneficial, 53 as injurious (mostly weevils and none of them real pests), and 23 as neutral. Some birds examined at Nagpur by Mr. D'Abreu contained honey-bees, dragonflies, blue-bottles, coprid beetles and one grasshopper. Mr. Inglis watched a bird at close range for twelve minutes during which it made twelve sallies after insects and it appeared to him that nine out of the twelve insects taken were bees. Besides bees, dragonflies are taken very largely; the species is not given as a rule but at Pusa I have seen this bird catch and eat *Potamarcha obscura*. So far as its feeding-habits go, therefore, this bird does not seem to deserve the protection throughout the whole year which it enjoys at present under the Wild Animals' Protection Act in Bombay, Bengal, Assam and Burma. It seems a pity that such a lovely little bird should be so noxious in its habits, " but pity 'tis, 'tis true ".

The Green Bee-eater breeds from the middle of March to the beginning of June, excavating a long gallery, generally four or five feet long, in a dry sandy bank. At Peshawar I have found it nesting in May in holes dug in sandy soil near the top of a river bank. As a rule, this bird does not seem to breed much south

of the Punjab but a few individuals remain in most localities, even as far south as Madras, and breed there. The excavation of the gallery for the nest is done, in alternative short spells, by both the parent birds, and when the gallery, which is about two inches in diameter, has been carried far enough within the bank, its end is widened out into a rounded chamber about twice the diameter of the gallery and in this chamber, without any further attempt at a nest, the eggs are laid to the number of three to five, usually three or four, occasionally more. Mr. Inglis has taken up to seven eggs and has also found a single young bird in a nest. The egg is a spherical oval, white and glossy, about 19 mm. by 17 mm. A nest-hole is shown in our Plate, which gives a good idea of this bird.

Blanford gives the following vernacular names of the Green Bee-eater, *Patringa* and *Harrial* in Hindi, *Banspati* in Bengali, *Tailingi*, *Veda Raghu* in Mahratti, *Chinna passeriki* in Telugu, *Kattalan Kuruvi* in Tamil, *Monagyi* in Arrakan, and *Hnet-pasin-to* in Burmese ; but, as he remarks, several of these terms are applied indiscriminately to other species of Bee-eaters also.

THE JAVAN BLUE-TAILED BEE-EATER

(*Merops superciliosus javanicus*)

MANY of the previous papers have dealt with useful birds—useful, that is, so far as agriculture is concerned—but the same adjective cannot be applied to the Javan Blue-tailed Bee-eater, as it is on the whole an injurious species by preying on beneficial insects.

In appearance and habits it is much like its commoner and smaller, but equally noxious, relative, the Indian Green Bee-eater (*Merops orientalis orientalis*), from which it is distinguishable by its larger size and by its chestnut throat (green or bluish-green in *Merops orientalis orientalis*). It is shortly described by Dewar (*Indian Birds*, p. 161) as " general hue green, shot with bronze ; the tail is bluish. There is a broad, black streak running through the eye. The chin is dirty cream colour. The throat is chestnut-red. The eye is bright red ".

The Javan Blue-tailed Bee-eater occurs commonly throughout the Plains of India but is partially migratory, visiting Northern India in the summer and Southern India in the winter. In the Central Provinces it is stated by Mr. D'Abreu to be resident throughout the year. In Bihar they are seen from March to October and in the Duars have only been noticed during June and July. Mr. Stuart-Baker only once came across it in North Cachar. Usually it is seen in small numbers or singly in one place but occasionally it congregates in large numbers. As a rule it is commonest in

well-wooded districts. It is fond of perching on a post or telegraph wire or other suitable situation whence it swoops down on its prey which is usually captured on the wing, the bird thereafter returning to its perch. The flight is swift and graceful and the note a mellow whistle continually uttered while on the wing. During evenings, especially after rain, numbers may be seen hawking about on the wing for a long period without settling.

In Calcutta the Javan Blue-tailed Bee-eater appears during the rains, usually in large flocks. It is often to be seen in large numbers in places abounding with open sheets of water, but it is also met with not infrequently in gardens where its elegant flight makes it a decided ornament. It is, however, a shyer bird than the Indian Green Bee-eater and its habits are not so easily observed at close quarters. It has been noticed to hawk its insect prey just over the surface of the water and sometimes even to pick an insect off the surface of the water.

This Bee-eater is common at Pusa and the late Mr. C. W. Mason examined the stomachs of thirteen birds between April and October. He states that, of 83 insects taken, 70 were beneficial, 3 injurious and 10 neutral. The beneficial insects taken included dragonflies, honey and other bees, and wasps, and in the neighbourhood of an apiary these birds may be a decided pest by snapping up the bees. Mr. Mason noted that, on dull days when dragonflies are inclined to sit on grass-stems, this Bee-eater feeds almost entirely on these insects and that the dragonfly, *Crocothemis servilia*, is one species which is taken in large quantities at such times.

Breeding occurs, usually in large colonies, some time between March and June, in a hole which may be four to seven feet long with a diameter of two to two and a half inches and which is excavated in a bank, usually a river bank though not always so, the egg chamber

being about half a foot in diameter and, what is unusual with Bee-eaters, it is sometimes lined with grass or feathers. Four or five and rarely seven glossy, white, almost globular, eggs are laid. Our Plate shows the entrance of a nest.

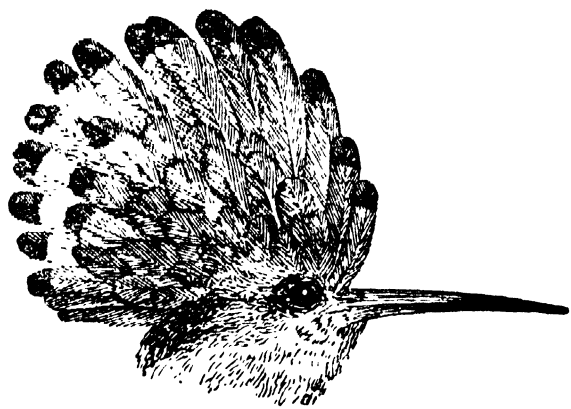
There are five other Bee-eaters found in India and Burma, viz., the Blue-cheeked Bee-eater (*Merops superciliosus persicus*), a race of the Blue-tailed bird, but has the upper surface of the tail green instead of blue. This is a migrant from Africa and West and Central Asia to the North-west of India, breeding there. The European Bee-eater (*Merops apiaster*), a smaller species with a yellow instead of a chestnut throat, is also a migrant from Africa, visiting Kashmir and the Punjab during May and June. The Chestnut-headed Bee-eater (*Melittophagus erythrocephalus erythrocephalus*) has a short tail and is chestnut above; this species is mostly confined to forests and is found in Ceylon, Southern India, the lower ranges of the Himalayas, and in Burma. The Blue-bearded Bee-eater (*Alcemerops athertoni*) and the Red-bearded Bee-eater (*Alcemerops amictus*) are stout birds for Bee-eaters, and have, as can be seen by the names, blue and red plumes down the breast; they are green above; these birds are not so graceful in their movements as the other Bee-eaters. Blanford says the nidification of the latter bird is unknown but since then the eggs have been taken in Perak in February; they appear to be smaller than those of the Blue-bearded species.

THE HOOPOE

(*Upupa epops*)

EXCEPT in Sind, the Western Punjab, and in the Duars where it appears to be rare, the Indian Hoopoe (*Upupa epops orientalis*) is one of the most familiar of the birds which live in the Plains of India, occurring commonly, and usually abundantly, as a resident in all suitable localities throughout India, Burma and Ceylon. It is a bird about the size of a Myna, fawn-coloured, the wings and tail white with very broad black bars, the legs short, the bill very long and slightly curved, and the back of the head with a conspicuous crest, which is normally kept folded so that it looks like a backward prolongation of the bill, but which is erected like an expanded fan when its owner is excited or disturbed or flies and when it first settles after flight. Specimens from South India and Ceylon run smaller and are much darker than those from Northern India and have been separated under the name *Upupa epops ceylonensis*. Burmese specimens run larger in size, and are intermediate in colour, and are separated as *U. epops longirostris*, a name derived from the greater length of the bill in Burmese examples. Besides the Indian species, the European Hoopoe (*U. epops epops*), distinguished by the presence of white between the buff ground colour and the black tips of the feathers of the crest on the head, is found in the Himalayas but not in East Nepal and Sikkim, during the summer and in the winter visits the northern half of India, extending as far south as the Deccan, Chota Nagpur and Bihar. Another race, the Tibetan Hoopoe (*Upupa epops saturata*), differing in being slightly darker and browner and less vinous on the breast, breeds in Tibet

and is resident there up to 12,000 feet ; it is also said to breed in the higher ranges of Sikkim. In winter it migrates to Burma, Assam and the Duars ; it has been found at Seoni, Belgaum and the Deccan but is rare west of Bengal. Some Indian specimens, especially those from the north, very often show a tinge of white on the crest, and these are regarded as hybrids between the Indian and European species. In North Bihar many specimens intermediate between the Indian and European forms are to be seen. In most parts of India, however, the buff-coloured bird which is seen



Head of European Hoopoe (after Blanford).

probing the lawn with its long bill may safely be put down as the Indian Hoopoe. A true albino with pink eyes has been recorded.

The Hoopoe is found chiefly in open country and is essentially a ground bird, only occasionally perching on trees. Its flight is slow and undulating. Like other birds which have developed a special type of bill, this organ is intimately adapted to its owner's method of obtaining food, which, in the case of the Hoopoe, consists of insects and occasional worms, obtained mostly on or from under the ground, rarely on trees or in the air. The major portion of its food is obtained

either by probing grassland for caterpillars living at the roots of the grasses, or by turning over leaves and rubbish for insects. It rarely picks them off plants or trees and still more rarely catches them on the wing, although winged termites are occasionally taken in this way. The favourite haunts of this bird are avenues, especially if grass is growing in these grasslands and lawns. It prefers slightly damp, but not wet, localities to dry ones, as its insect food is then more easily procurable. It is an interesting sight to see these birds regularly quartering a lawn, stopping every now and then to dig and probe the soil with their long beaks, the result of investigation generally yielding some insect, which is extracted and swallowed. If, however, the parent bird is collecting material to feed its young, it is often robbed by a King-crow, as we observed in our previous article on that bird.

As Mason remarks, the young birds are fed almost entirely on caterpillars (probably all cutworms), grubs of Melolonthids, and crickets, and the amount of food fed during the day to a nest of half-grown young is extraordinary. Mr. Mason watched a nest one day from 6 a.m. and in the first hour fifty-eight visits were made to the nest by the old birds, and during these visits forty-five insects were almost certainly cutworms, ten were other caterpillars and grubs (some almost certainly *Anomala* grubs) and three were crickets (one of these may have been a large beetle) ; during the next half-hour twenty-seven caterpillars and grubs were brought and fed to the young birds. All this food was obtained from grass lawns or under *Sissu* and mango trees. Only one insect was brought at each visit and all these insects were large ones. The same nest was watched again by Mr. Mason a week later, but the birds now seemed more wary and consequently but few of the insects fed could be identified but they appeared to be the same kinds as observed before. On the latter occasion 286 visits were paid to the nest by the parent birds between

6 a.m. and noon and about two visits per hour were made when apparently no insects were brought, so that about 274 insects were brought in and fed in six hours to the young birds, who numbered four or five at most. The food brought to the young consists practically wholly of caterpillars, beetle grubs and crickets. When bringing in food to the nest, the old bird as a rule perches near the nest to look around for danger and almost always utters a harsh grating sound on approach to the nest and again on entering and leaving the nest.

The nesting season is in the early spring or beginning of the hot weather, and nesting takes place in any convenient hole, never at any great elevation from the ground, in trees, walls or banks. A nest has even been found on the floor of a house amongst some *bhusa* (chaff). The nest itself is a mere apology, a little hair, a few feathers, leaves or grass-stems being carelessly strewed over the floor of the hole or hollow and, when eggs are laid in a tree-hole, there is often no nest at all. These birds never remove the droppings from their nest and the stench of these is most overpowering. Four to six eggs are laid as a rule, but as many as nine are reported to have been met with occasionally. So many young are not always reared and one of these birds has been seen dropping two out of four of its young from the nest, presumably to reduce the number of mouths to feed. The egg is a very lengthened oval, pointed at one end and sometimes tending to be pointed at the other end also, not glossy, uniformly pale greyish-blue or olive-green or olive-brown or any intermediate shade, the average size being 24 mm. by 16·5 mm. The female bird alone incubates the eggs and, especially when the eggs are near hatching, scarcely ever leaves them alone for a moment, being assiduously tended by the male bird, who brings her food continually. Mr. Inglis has seen a male bird, before the breeding season had commenced, run up to his mate and present her with an ant-lion

grub. When the female bird is sitting closely in this way, she hisses like a snake if disturbed. They are very loath to leave the localities where they breed. On one occasion, to inspect a nest, the hen bird had to be pulled out of the hole and in doing so some of her tail feathers came out, but even this rather severe handling did not make her quit the place.

The young nestlings, as noted above, are fed by the parents on caterpillars and crickets and, as soon as they are able to leave the nest, they may be seen trotting after their anxious parents, making inefficient attempts at digging on their own account, but always ready to run up and have supplies thrust far down their throats by the long, curved beaks of their guardians.

It will readily be understood that a bird which feeds on insects, as does the Hoopoe, is a very useful one to the farmer. From actual examination of the stomach contents of twenty-four birds at Pusa, the late Mr. C. W. Mason found that these had swallowed 278 insects of which the majority belonged to injurious species. A large proportion of its food also consists of cutworms and other insects living below the actual surface of the ground, so that they are fairly immune to most other enemies, and from this point of view, as a destroyer of cutworms and cockchafer grubs, the Hoopoe is most decidedly amongst the farmer's best friends and deserves every encouragement and protection. It is protected throughout the whole year, under the Wild Birds Protection Act, in Bombay, Delhi, the United Provinces, Bihar, Bengal, Assam and Burma, but in Madras in the Shevaroy Hills only. In Mysore it is not specifically protected but is presumably included in the schedule which includes all birds of bright plumage.

Both the Indian and European Hoopoes are known in Hindustani as *Hud-hud* and in Mahratti as *Sutar*. The name

Hud-hud, as also the English name Hoopoe, are both derived from the call of these birds, a gentle " ŭK, ŭK, ŭK, ŭK, ŭK ", usually uttered when sitting on an exposed branch of a tree, the head being depressed until the tip of the beak almost touches the breast, the crest at the same time being laid flat down. This cry should not be confounded with the much louder and deeper call of the Crow-pheasant.

Hoopoes have been kept in confinement and of course require an aviary and not a cage : the aviary should have turf laid down, as otherwise the bird's bill gets damaged whilst probing about for insects. Butler says " the best food for it consists largely of soaked ants' cocoons, supplemented by mealworms, spiders, insects of all kinds, and earthworms ". They are said to get very tame in captivity.

The Hoopoe is looked on as a favourite because, so the story goes, he was King Solomon's messenger, and he is known as the King of Birds from the legend of his crest and crown, which is related by the Hon. Robert Curzon as follows :—

In the days of King Solomon, the son of David, who, by the virtue of his cabalistic seal, reigned supreme over genii as well as men, and who could speak the languages of animals of all kinds, all created beings were subservient to his will. Now, when the king wanted to travel, he made use, for his conveyance, of a carpet of a square form. This carpet had the property of extending itself to a sufficient size to carry a whole army, with the tents and baggage ; but at other times it could be reduced so as to be only large enough for the support of the royal throne, and of those ministers whose duty it was to attend upon the person of the sovereign. Four genii of the air then took the four corners of the carpet, and carried it with its contents wherever King Solomon desired. Once the king

was on a journey, in the air, carried upon his throne of ivory over the various nations of the earth. The rays of the sun poured down upon his head, and he had nothing to protect him from its heat. The fiery beams were beginning to scorch his neck and shoulders, when he saw a flock of vultures flying past. " O vultures ! " cried King Solomon, " come and fly between me and the sun, and make a shadow with your wings to protect me, for its rays are scorching my neck and face ". But the vultures answered, and said, " We are flying to the north, and your face is turned towards the south. We desire to continue on our way ; and be it known unto thee, O king ! that we will not turn back in our flight, neither will we fly above your throne to protect you from the sun, although its rays may be scorching your neck and face ". Then King Solomon lifted up his voice, and said, " Cursed be ye, O vultures ! and because you will not obey the commands of your lord, who rules over the whole world, the feathers of your neck shall fall off ; and the heat of the sun, and the cold of the winter, and the keenness of the wind, and the beating of the rain, shall fall upon your rebellious necks, which shall not be protected with feathers, like the neck of other birds. And whereas you have hitherto fared delicately, henceforward ye shall eat carrion and feed upon offal ; and your race shall be impure till the end of the world ". And it was done unto the vultures as King Solomon had said.

Now it fell out that there was a flock of hoopoes flying past ; and the king cried out to them, and said, " O hoopoes ! come and fly between me and the sun, that I may be protected from its rays by the shadow of your wings ". Whereupon the king of the hoopoes answered, and said, " O king ! we are but little fowls, and we are not able to afford much shade ; but we will gather our nation together, and by our numbers we will make up for our small size ". So the hoopoes gathered together, and, flying in a cloud over the throne of the king, they sheltered him from the rays of the sun.

When the journey was over, and King Solomon sat upon his golden throne, in his palace of ivory, whereof the doors were emerald, and the windows of diamonds, larger even than the diamond of Jemshea, he commanded that the king of hoopoes should stand before his feet.

"Now", said King Solomon, "for the service that thou and thy race have rendered, and the obedience thou hast shown to the king, thy lord and master, what shall be done unto thee, O hoopoe? and what shall be given to the hoopoes of thy race, for a memorial and a reward?"

Now the king of the hoopoes was confused with the great honour of standing before the feet of the king; and making his obeisance and laying his right claw upon his heart, he said, "O king, live for ever! Let a day be given to thy servant, to consider with his queen and his counsellors what it shall be that the king shall give unto us for a reward". And King Solomon said, "Be it so".

And it was so.

But the king of the hoopoes flew away; and he went to his queen, who was a dainty hen, and he told her what had happened, and desired her advice as to what they should ask of the king for a reward; and he called together his council, and they sat upon a tree, and they each of them desired a different thing. Some wished for a long tail; some wished for blue and green feathers; some wished to be as large as ostriches; some wished for one thing, and some for another, and they debated till the going down of the sun, but they could not agree together. Then the queen took the king of the hoopoes apart and said to him, "My dear lord and husband, listen to my words; and as we have preserved the head of King

Solomon, let us ask for crowns of gold on our heads, that we may be superior to all other birds".

And the words of the queen and the princesses, her daughters, prevailed; and the king of the hoopoes presented himself before the throne of Solomon, and desired of him that all hoopoes should wear golden crowns upon their heads. Then Solomon said, "Hast thou considered well what it is that thou desirest?" And the hoopoe said, "I have considered well, and we desire to have golden crowns upon our heads". So Solomon replied, "Crowns of gold shall ye have: but, behold, thou art a foolish bird; and when the evil days shall come upon thee, and thou seest the folly of thy heart, return here to me, and I will give thee help". So the king of the hoopoes left the presence of King Solomon with a golden crown upon his head, and all the hoopoes had golden crowns; and they were exceedingly proud and haughty. Moreover, they went down by the lakes and the pools, and walked by the margin of the water that they might admire themselves, as it were in a glass. And the queen of the hoopoes gave herself airs, and sat upon a twig; and she refused to speak to the merops, her cousins, and the other birds who had been her friends, because they were but vulgar birds, and she wore a crown of gold upon her head.

Now there was a certain fowler who set traps for birds; and he put a piece of a broken mirror into his trap, and a hoopoe that went in to admire itself was caught. And the fowler looked at it, and saw the shining crown upon its head; so he wrung off its head, and took the crown to Issachar, the son of Jacob, the worker in metal, and he asked him what it was. So Issachar, the son of Jacob, said, "It is a crown of brass", and he gave the fowler a quarter of a shekel for it, and desired him, if he found any more, to bring them to him, and to tell no man thereof. So the fowler caught some more hoopoes, and sold their crowns to Issachar, the son of Jacob;

until one day he met another man who was a jeweller, and he showed him several of the hoopoes' crowns. Whereupon the jeweller told him that they were of pure gold, and he gave the fowler a talent of gold for four of them.

Now when the value of these crowns was known, the fame of them got abroad, and in all the land of Israel was heard the twang of bows and the whirling of slings ; bird-lime was made in every town, and the price of traps rose in the market, so that the fortunes of the trapmakers increased. Not a hoopoe could show its head but it was slain or taken captive, and the days of the hoopoes were numbered. Then their minds were filled with sorrow and dismay, and before long few were left to bewail their cruel destiny.

At last, flying by stealth through the most unfrequented places, the unhappy king of the hoopoes went to the court of King Solomon, and stood again before the steps of the golden throne, and with tears and groans related the misfortunes which had happened to his race.

So King Solomon looked kindly upon the king of the hoopoes and said unto him, " Behold, did I not warn thee of thy folly, in desiring to have crowns of gold ? Vanity and pride have been thy ruin. But now, that a memorial may remain of the service which thou didst render unto me, your crowns of gold shall be changed into crowns of feathers, that ye may walk unharmed upon the earth ". Now, when the fowlers saw that the hoopoes no longer wore crowns of gold upon their heads, they ceased from the persecution of their race ; and from that time forth the family of the hoopoes have flourished and increased, and have continued in peace even to the present day.

THE LONG-TAILED NIGHTJAR

(*Caprimulgus macrourus*)

THE Nightjars form a small family of birds of which eleven species, representing sixteen named forms contained in two genera, occur within Indian limits. Two of these, the Burmese Great Eared Nightjar (*Lyncornis cerviniceps cerviniceps*), which occurs in Burma, Assam, Manipur, Chittagong and Tippera and Bourdillon's Great Eared Nightjar (*Lyncornis cerviniceps bourdilloni*) only in Travancore, are readily distinguishable by the presence of tufts of feathers just above and behind the ear-coverts, but all our other Indian Nightjars belong to the typical genus *Caprimulgus*, without ear-tufts, and are very much alike, all being brownish or yellowish-grey mottled with darker and lighter spots. In habits, as in general appearance, they are all very similar, resting during the day-time on the ground amongst vegetation or stones or clods of earth, and appearing on the wing only at dusk, when they hawk about for insects which they catch either on the wing by means of their large mouth, which can be opened very widely, or on the ground. They are rarely seen in the day-time, when they keep quite motionless, squatted on the ground, and are readily passed over as a clod of earth, but are commonly seen on the wing in the evening or may be found on roads catching dung-beetles attracted to cattle droppings.

As in some other groups of birds, the typical Nightjars have a comb-like formation on the inner side of the long middle toe, but the use of this structure appears to be unknown although it is

supposed to be of use in cleaning the beak and the long rictal bristles from the hooked claws of beetles and from the scales of moths which have been caught in the mouth. These birds have also strongly developed rictal bristles which doubtless assist them to obtain insect prey on the wing.

Their noiseless flight is very characteristic and more resembles that of a gigantic moth than that of a bird. It consists of a few quick flappings of the wings alternated with rapid and complicated glides and wheels through the air with wings widely extended. Sometimes the tips of the long wings are brought together above the back with an audible smack. Its position at rest also makes it easy to place a bird as a Nightjar, as it squats down with its whole body on the resting surface ; also when a Nightjar perches on a branch, it sits on it lengthwise, and not across it as other birds do.

Their food consists entirely of insects, largely moths and beetles, captured both on the wing and on the ground. They may therefore be considered as useful birds but hardly occur in sufficient numbers, as a rule, to do very much good. It should be noted, however, that the quantity of moths captured and devoured by a single bird is astonishingly large.

As already noted, all the Nightjars look very much alike, at least when seen at large after nightfall. The Common Indian Nightjar (*Caprimulgus asiaticus*), distinguished by having distinct but narrow black streaks on the back, in combination with an almost naked tarsus, occurs commonly throughout most parts of the Plains of India, Ceylon and North Burma. It appears to be absent from the Duars. It is found in open and cultivated country, groves, gardens and non-forested areas generally and is often seen near habitations. It occurs commonly in the larger gardens of Calcutta and is sometimes known as the "Ice-bird", because its

cry, which is constantly heard at night, is like the sound made by a stone skimming over the frozen surface of a pond, the note being repeated slowly at first and then more quickly.

The species to which the bird represented in our Plate belongs is one of the larger Nightjars, there being five races, all very much alike; they come into two groups, two races having the wing under 200 mm., one with the wing sometimes more than that and two with the wing always more than 200 mm. In the first group are Jerdon's Long-tailed Nightjar (*Caprimulgus macrourus atripennis*) from Ceylon and South India, north to Godavari and



Common Indian Nightjar (*Caprimulgus asiaticus*); left foot and head.
(After Blanford, *F. I. Birds*, Vol. III, figs. 53 and 54.)

Belgaum; it has black marks on the centre of the crown and dark plumage above; the Andaman race (*Caprimulgus macrourus andamanicus*) confined to the Andamans; in it the black markings on the head are not confined to the centre; the Burmese race (*Caprimulgus macrourus bimaculatus*) has the black marks on the crown confined to the centre but is paler than *atripennis* and the wing is sometimes more than 200 mm. In the group with the larger wings are the Indian Long-tailed Nightjar (*Caprimulgus macrourus albonotus*) which is the form found in North Bihar and represented on our Plate; it is found from North-West India to South Assam (those from North Assam belong

to the next race), south to the north of the Bombay Presidency, Central Provinces and Orissa ; the Nepal Long-tailed Nightjar (*Caprimulgus macrourus hodgsoni*) found in Nepal, Sikkim and hills of Northern Assam, it is darker below than *albonotus* and more profusely barred.

With regard to our common Bihar race it occurs from the Plains to as high as 8,000 feet but usually keeps below 5,000 feet.

Regarding its habits, Mr. Stuart-Baker, writing on the Birds of North Cachar, gives the following interesting note, which may be quoted *in extenso* :—" My house is built on a hill, the garden on the steepest side coming up to the very brow of the steep, almost precipitous grass slope, leaving room only for a narrow foot-path for the servants and hill-people just outside the fence. This path-way is the favourite haunt after dusk of this fine Nightjar and I, seated motionless on the bank, often have had them approach me within a few feet, so near indeed that I have more than once tried to catch them with a short butterfly-net. I believe it is not at all generally known how much these birds feed on the ground, but I have constantly observed them so feeding, and butterflies or other large *dead* insects which were placed near their favourite resting-places were greedily eaten by them. Their movements on the ground are stronger and quicker than might be expected, judging from the formation of their feet, and they *run* in exactly the same manner as do Martins and Swallows when collecting mud for their nests.

" A very remarkable trait in this bird is the fact that the female will accept the advances of more than one male, but, remarkable as it is, it is undoubtedly the fact, for on one occasion I was a witness of it nor could there be any mistake, for both males were present at the same time and within three yards of me.

"The actions of the young are very peculiar; tiny mites, still blind—their eyes do not seem to open till the seventh day—will when first discovered or when they hear a heavy tread near them, lie flat on the ground, their colour closely assimilating with the dead bamboo leaves or other material on which they lie; should, however, the danger of discovery become very imminent, they will crawl under the leaves and hide from sight altogether".

Like other Nightjars, the Indian Long-tailed Nightjar makes no nest, laying its eggs on the bare ground, usually in some sheltered situation. Pairing begins in March and eggs are usually laid by the end of this month or early in April in the Plains, or a little later in the Hills. The number of eggs laid seems to be always two. The eggs vary somewhat in colour, from creamy-white to salmon or fleshy clay colour, blotched and speckled with reddish-brown, and measure about 30 mm. by 22 mm. The egg is shown in figure 26 of Plate II at the end of this book. The hen bird sits very closely on her eggs, so that she may almost be trodden upon before flying off. Speaking of Nightjars in general, Newton remarks:—"So light is it that the act of brooding, even where there is some vegetable growth, produces no visible depression of the grass, moss, or lichens on which the eggs rest, and the finest sand almost equally fails to exhibit a trace of the parental act. Yet scarcely any bird shows greater local attachment and the precise site chosen one year is almost certain to be occupied the next".

The call of this species is quite different from that of the "Ice-bird", consisting of the sounds "*chounk chounk*" repeated at intervals, and may be compared to the sound made by striking a plank with a hammer. When on the wing it also utters a low chirping cry.

The Nightjars are also known as Goat-suckers, from a popular idea that they suck the milk of goats : it is hardly necessary to say that they do nothing of the kind. Vernacular names applied to Nightjars generally in India are *Chippak* or *Chappa*, *Dab-churi* or *Dabhak* (an appropriate name, derived from *dabna*, to crouch), and *Andha-chiriya* (blind bird). Other appropriate names are *Kappa-pitta* (frog bird, Telegu) and *Pathekai* (roadside bird, Tamil). In Burmese it is *Hnet-pyin*.

THE SPOTTED OWLET

(*Athene brama*)

OF the sixty-two owls which are found within Indian limits, the Indian Spotted Owlet (*Athene brama indica*) and the Southern race are probably at once the commonest and most familiar. The Northern race occurs abundantly throughout the Plains of India, north of 14° and east to Assam and west to Sind. This little Owlet is in evidence during the early evening often before sunset and long before dusk, when most other owls have not yet ventured out. It is, moreover, quite a domestic owl, keeping especially to trees in cultivated tracts such as gardens around houses, and it is commonly found roosting and breeding in the roofs of houses where these afford the necessary shelter. It is fond of perching on the branch of a tree or on a pole or fence or telegraph-wire ; indeed, as Hume remarks, it is one of the birds that seem to think that telegraph-wires were erected for their sole and especial benefit. It is a decidedly noisy bird, making itself most evident to the ear in the evening or early morning, but frequently heard at intervals during the night, when a regular volley of chuckles and squeaks is poured forth by one or more of these little owlets ; but the noise is not sustained for any length of time.

In the day-time, like other owls, the Spotted Owlet hides away in some dark corner, such as a hole in a tree or wall or in a house-roof or even in a bungalow verandah if no better situation offers, emerging towards sunset to hunt for prey. As Cunningham remarks, it is most diverting to watch them emerging ; one after

another, before fairly coming out, putting forth its queer little round head and staring eyes through the opening of the cavern. After they have emerged they usually sit very quietly for a time as though only half awake, and are either perfectly silent or occasionally utter a low-toned " chirrk ". Then, all of a sudden, they begin to chuckle and finally break out into a perfect torrent of hoarse chattering; and finally, after having indulged in such exercises for some minutes, they spread their short, rounded wings and sail off to their night's hunting.

However, it does not seem to mind the full blaze and heat of the sun, as we have seen it in the early afternoon on a hot April day sunning itself with outspread wings on the bare gravel in front of the bungalow. A pair which have for years inhabited the bungalow of one of us (C. M. I.) may often be seen during the day-time either perched on some *sambhar's* antlers on the verandah wall or else flying with undulating flight to a tree in the garden, usually to a tamarind tree, and, after staying there a short time, returning to their hole. We have also seen them on a drizzly day seated on a perch outside, enjoying a shower bath.

It is one of the birds that hawk termites (white ants, so called) along with Rollers, etc. Mr. Stuart-Baker writes that they are great bat hunters, not catching them on the wing but hauling them out of their holes; but apparently all these owls do not wage war against bats and this habit is perhaps local or confined to a few individuals.

It lives chiefly on insects and to a less extent on mice, shrews and lizards, its insect prey consisting mostly of beetles and crickets. In the case of eight birds examined at Pusa by the late Mr. C. W. Mason, of 69 insects taken, one was of a beneficial species, twenty-six were neutral and forty-two were injurious. Hume mentions a case,

reported by Colonel Butler, in which a pair of Spotted Owlets had apparently attacked a nesting Paroquet (*P. krameri*), killed it on the nest and taken possession of this for themselves. As the Paroquet is a perfect pest to the agriculturist, we can only wish that the Spotted Owlet would act regularly in this way. At Pusa this little Owl seems to live largely on large crickets (*Brachytrupes* and *Gryllotalpa*) and on dung-beetles. There is no doubt that it is a most useful bird in all districts where large crickets occur so commonly as to do damage. As these crickets are nocturnal, retreating into their subterranean burrows during the day-time and only emerging to feed under cover of night, their most effective natural enemies are those, such as the Spotted Owlet, which are also nocturnal and which can swoop down and destroy them whilst they are feeding above ground. One commonly sees this little Owl swoop down from its perch and catch some prey on the ground, returning to its perch to devour it, usually to the accompaniment of a burst of chattering which is presumably its form of thank-offering for a good supper.

Our Plate gives a good idea of this little Owl and the left-hand figure shows the terrifying attitude, assumed, after first sitting up very erect, by suddenly crouching down and frowning and glaring in a terrible way, to frighten any observer or intruder.

The Spotted Owlet breeds from February to April, the period being slightly earlier in the south and later in Northern India, but the great majority of birds lay in March, laying usually three, four or five white (pink when fresh) eggs in a hole, in a tree or building, the nest being scantily lined with a few dry leaves, grass, decayed wood, or feathers. We have taken three clutches of three eggs each from one nest but even then the birds would not desert their nesting site. Incubation evidently starts as soon as the bird lays as we have taken at the same time from one nest one young, two,

highly incubated and one perfectly fresh egg. The fluffy young, when fledged, are drab-and-white with yellow eyes just like their parents and, also like their parents, are exceedingly noisy, each member of the family, as Dewar puts it, talking gibberish at the top of its voice, sixteen to the dozen, and as all will persist in speaking at once, the result is a nocturnal chorus that will bear comparison with the efforts of the cats which enliven the Londoner's back yard.

Jerdon, quoting Sykes, writes that "the Mahrattas have a superstition regarding this species, and a class of people called *Pinglch* live on the credibility of the people by pretending to consult it and predict events". Jerdon also says that this Owlet is used by some *shikaris* to catch small birds. It is pegged out near a low bush, the branches of which have been smeared with bird-lime, so that any small birds that come to mob it settle on the bush and are caught on the limed twigs. It is, however, noticeable that this Owl does not seem to be molested by birds, as other larger Owls are, probably because it is more at home in daylight and so does not attract notice by the blundering flight assumed by other Owls when they venture out by day. Its flight is indeed far from a blundering one and, in the *Bombay Natural History Society's Journal*, Mr. G. O. Allen has called attention to its occasional habit of hovering; this we have also noticed at times and it is probably assumed when watching some small prey which has emerged from its burrow.

Besides the North Indian form two other geographical races of this species occur within Indian limits; these are the Southern Spotted Owlet (*Athene brama brama*), found in Southern India below 14° North latitude; the Burmese Spotted Owlet (*Athene brama pulchra*) found in Central and Southern Burma; the Forest Spotted Owlet (*Athene blewitti*) has no races and is found in forest

areas in Sambalpur, Karial and Khandesh ; *Athene noctua*, with a longitudinally streaked abdomen thus differing from those above mentioned which have it transversely barred, has two races; Hutton's Owlet (*Athene noctua bactriana*), a straggler into North-West India along the Afghan frontier and Baluchistan ; and the Tibet Owlet (*Athene noctua ludlowi*), found in Tibet. A specimen from the Mishmi Hills may be this race.



THE CATTLE EGRET

(*Bubulcus ibis coromandus*)

MOST of the birds dealt with in these articles are of general occurrence and as likely to be found in Calcutta, or any other large town, as in the surrounding country-side, but the subject of our present paper seems to have little use for a town life, although it is one of the " common objects of the country " in most parts of the *mofussil*. According to Mr. Stuart-Baker, in North Cachar it ascends the hills to 2,200 feet. The Cattle Egret (*Bubulcus ibis coromandus*), as its popular name implies, is an Egret which is especially attached to cattle—frequently accompanying these animals and feeding on the grasshoppers and other insects disturbed as the cattle move about and also picking off insects, ticks and leeches which are attracted to the cattle. It is a very tame bird, even coming into compounds where any cattle are grazing. It is a social bird, generally occurring in parties, accompanying the cattle in the fields and frequently perching on their backs. Sometimes it attends pigs also and relieves them of lice. Occasionally it accompanies crocodiles and apparently picks leeches or other parasites off them, and sometimes it varies its diet with small fish, tadpoles and aquatic insects. The late Mr. C. W. Mason investigated the stomach contents of three birds at Pusa in December 1909 and found that they contained 166 insects, of which three were Carabid beetles which were classed as beneficial, three as neutral, and 160 as injurious, the majority of this last category comprising grasshoppers and flies. There is no doubt but that this bird is decidedly beneficial to the agriculturist in India, not only helping to keep down grasshoppers and other crop-pests, but reducing the numbers of blood-sucking pests which prey upon cattle.

The Cattle Egret is easily recognizable, being a pure white bird with a yellow bill and black legs during most of the year. In the breeding season, which is at the beginning of the rains, some hair-like yellowish plumes grow from the head, neck and back

as seen in the right-hand figure of our Plate ; these nuptial plumes are orange-coloured on the head and neck, those on the back orange-buff varying to pinkish or brownish buff. In Bihar this plumage is assumed in April, but in the case of one colony which was breeding on some mango trees in August there were just as many birds in the pure white as in the usual breeding plumage.

Before legislation took place this Egret suffered the same fate as those with more valuable plumes, but now it appears to be



Cattle Egret (in winter plumage).

much less molested. It is protected by law throughout the whole year in the Central Provinces, Bombay, Bihar and Orissa, United Provinces, Delhi, Madras, Burma, and Assam.

As noted above, the Cattle Egret is a social bird at normal times, contrary to the habit of most Herons during the non-breeding season, and it is probable that this social trait is the direct result

of its attendance upon cattle. At the breeding season, however, which is from July to August in regions watered by the South-West Monsoon, December to March in Southern India and from January to May in Ceylon, this sociability is greatly accentuated and the Cattle Egret at this time breeds together in vast numbers, often in company with other Egrets, Pond Herons and similar



Cattle Egret (in summer plumage).

marsh-loving birds, making a large untidy nest of sticks, built in a tree, often in tamarind trees around village ponds, and laying three to five very pale greenish or bluish eggs, almost white, which vary much in size and shape but are typically rather broad ovals, somewhat pointed towards one end, and measuring on the average 44·1 mm. long by 33·6 mm. broad.

Ea quæ scimus sunt pars minima eorum, quæ ignoramus.

Linnæus, *Systema Naturæ* (ed. X), p. 823.

EXPLANATIONS OF FIGURES OF BIRDS' EGGS.

Plate I.

Fig.	1.	Jungle Crow	Smooth, dull grey-green, blotched with dark fuscous and dirty orange-brown.
,,	2.	House-Crow	Smooth, pale bluish, blotched and speckled with dirty brown.
,,	3.	Koel	Smooth, dull olive-green, blotched with dull orange-brown and purplish-brown. From nest of House-Crow.
,,	4.	Bengal Tree-Pie ..	Smooth, pale bluish-white, faintly blotched with very pale orange brown.
,,	5.	Bengal Jungle-Babbler ..	Very glossy, greyish-blue.
,,	6.	Bengal Red-vented Bulbul	Smooth, pinkish-white, blotched with red-brown.
,,	7.	Drongo	Smooth, dull white, blotched with orange-brown and blackish.
,,	8.	Tailor-bird	Whitish, blotched with dull orange-brown.
,,	9.	Black-headed Oriole ..	Glossy white with slight pinkish tinge, blotched with purplish-brown.
,,	10.	Myna	Pale blue. From nest in which Koel's egg (11) was deposited.
,,	11.	Koel	Dull grey-green, blotched with red-brown. This egg was deposited in the nest of a Myna, a very unusual occurrence.
,,	12.	Pied Myna	Dull pale-blue, glossy.
,,	13.	Paradise Fly-catcher ..	Dull white, smooth, with brownish-red and dull purplish-brown spots.
,,	14.	Magpie-Robin	Smooth, glossy, pale grey-blue, spotted with reddish-brown.
,,	15.	Weaver-bird	Colour dull white.
,,	16.	Indian House-Sparrow ..	Smooth, pale greyish-white, blotched with dull purplish-brown and purplish-black.
,,	17.	White-eye	Smooth, dull bluish-white.
,,	18.	Purple Honey-sucker ..	Smooth, whitish, speckled with dull purplish-grey

Plate II.

Fig.	19.	Golden-backed Woodpecker	White, smooth, slightly glossy.
,,	20.	Green Barbet	Dull white, smooth, not glossy.
,,	21.	Coppersmith	Pure white, smooth.
,,	22.	Indian Roller	Pure white, glossy.
,,	23.	Indian Green Bee-eater ..	Pure white, glossy.
,,	24.	Blue-tailed Beeea-ter ..	Pure white, glossy.
,,	25.	Indian Hoopoe	Dull dirty white, no gloss.
,,	26.	Indian Long-tailed Nightjar	Glossy, whitish, slightly tinged with yellow, with pale blotches of brown and purple.
,,	27.	Hawk-Cuckoo	Smooth, dull blue.
,,	28.	Rose-ringed Paroquet ..	Dull white, smooth, without pitting.
,,	29.	Indian Spotted Owlet ..	Dead white, smooth, hardly glossy.
,,	30.	Cattle Egret	Dull white, smooth, not glossy.

Note.—The short descriptions of Eggs, given above, are taken from the actual (blown) specimens from which the drawings were made.

PLATE ONE

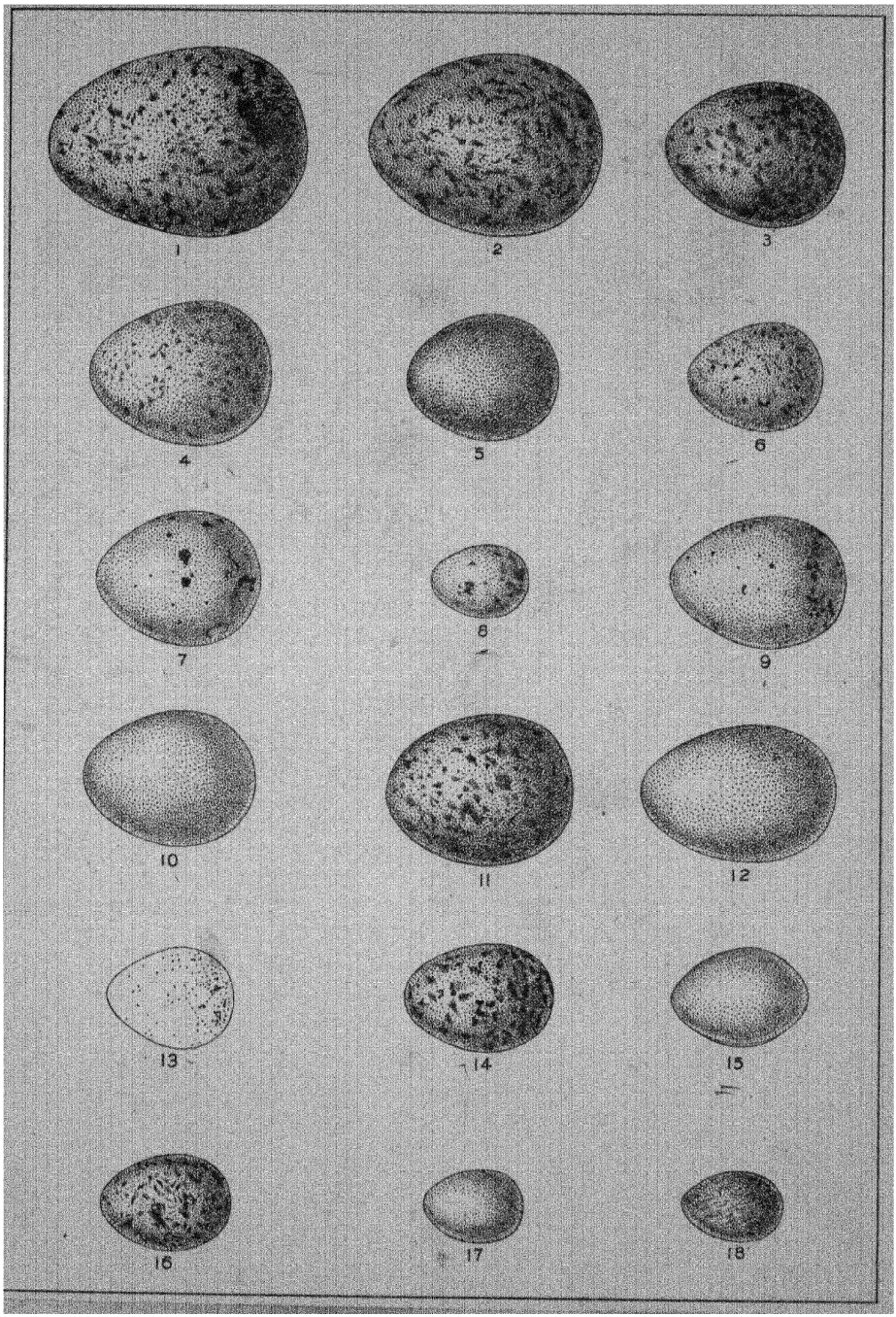


PLATE TWO

