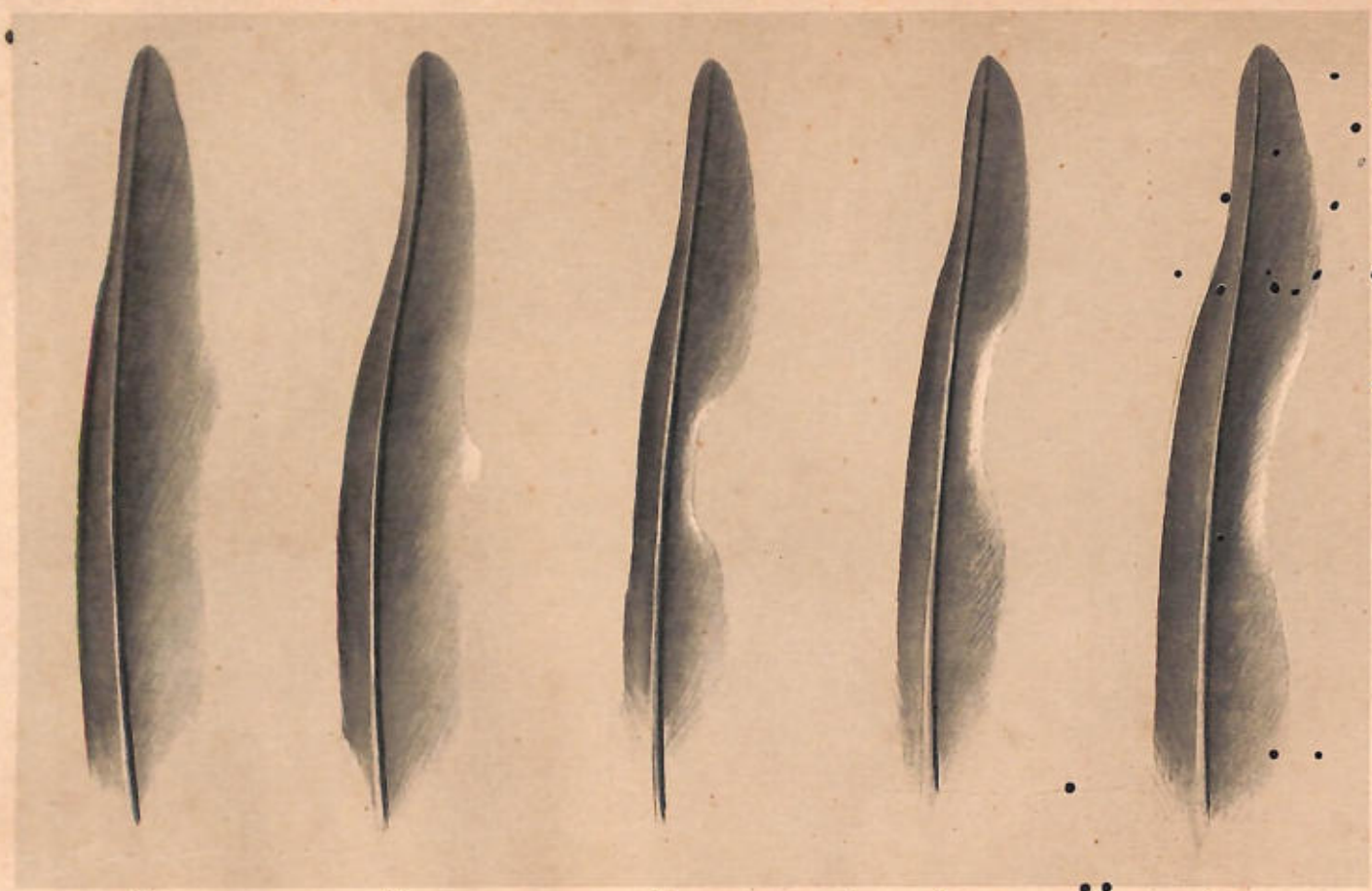




a. b. c. d. e.

THIRD PRIMARIES of

a. Sphenocercus a. apicaudus. b. S. s. sphenurus. c. Dendrophasa b. bicincta. d. Treron curvirostra nipalensis. e. Butreron capellii.

THE FAUNA OF BRITISH INDIA

INCLUDING

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EDITED BY E. C. STUART BAKER, O.B.E., F.Z.S., Etc.

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(Second Edition.)

BY

E. C. STUART BAKER, O.B.E., F.Z.S., Etc.

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AUTHOR'S PREFACE.

READERS of the 'Fauna of British India' will note with the deepest regret that the present volume contains no Editor's Preface for, shortly after the issue of the fourth volume of the Avifauna, Sir Arthur E. Shipley passed away. We lose in him an editor with whom to work was a pleasure and whose courtesy, tact, and kindness were unfailing. The scientific world is the poorer for his loss, whilst the author of the Avifauna volumes and, I am sure, the authors of all the other volumes also, feel that they have lost a personal and much valued friend as well as editor.

We are very glad to be able to announce that Col. J. Stephenson, C.I.E., has been selected to edit future volumes of the Fauna and we welcome in him one who is already known to us in name and reputation if not in person.

The present volume of the Avifauna is the fifth of the series and will be the last but one dealing with the birds themselves. It contains the following Orders:—(1) The *Accipitres*, or diurnal Birds of Prey; (2) the *Columbæ*, or Doves and Pigeons; (3) the *Pterocletes*, or Sand-Grouse; (4) the *Gallinæ*, or Game-Birds; and (5) the *Hemipodii*, or Bustard Quails. All of those Orders were accepted by Blanford and the only changes made are minor ones in families and genera, the most important, perhaps, being the acceptance of Beebe's two subfamilies of Game-Birds, the *Phasianinæ*, or Pheasants, and *Perdicinæ*, or Partridges. These are based, as Beebe has himself observed, on characters which may not prove universally correct but which are convenient and correct in so far as we are at present aware.

The number of species and subspecies described in these orders is 306, an increase of 108, practically a third more than admitted in the same orders by Blanford in 1898. An analysis of the increase is very interesting and is a wonderful tribute to the acumen and thoroughness of our leading Indian ornithologists of the nineteenth century. No fewer than 52 of the additional subspecies now accepted had already been named by Hume, Blyth and others, and their differences pointed out. Thirty-eight new subspecies have been created since 1898, whilst 18 additional species and subspecies have been added to our Avifauna, nearly all upon our North-Eastern and South-Eastern borders. Two species have been eliminated as not separable, and 24 species, accepted as such in the first edition, have now been relegated to the rank of subspecies.

The Orders of Aves dealt with in this volume are very generally accepted and, as each is fully discussed as it is reached in the following pages, it is unnecessary for me to comment on them here, or to give my reasons for accepting these and discarding others.

I do not imagine that the classification I have adopted is final, or that my nomenclature is without any mistakes, or the division of many species into subspecies complete. I would ask my readers to remember that each volume of the Avifauna merely forms a basis upon which future systematists may work and, for this reason, volume has succeeded volume in the shortest time compatible with fairly accurate work. Had all the time desirable from the author's point of view been expended on each species and subspecies, its synonymy and nomenclature, years would have elapsed between each volume and the greater finality attained would not have compensated for the many evils of delay. It is hoped that the present volumes may induce ornithologists, more particularly those who specialize in areas smaller than the whole Indian Empire, to set to work to correct the many mistakes they must contain and to publish their corrections as soon as possible.

Already much good work has been done in this way. Notably Dr. C. B. Ticehurst, who has specialized on Sind

and Punjab birds, has ferreted out certain names older than those I have employed, whilst he has also shown that certain additional geographical races must be admitted in the extreme North-West of India. In the opposite corner of the Empire, Mr. H. C. Robinson has done similar work in reference to the Malay States and Peninsula, Burma and Siam.

The next volume will complete the Birds and, if there is room, will also contain the corrigenda and addenda to the first volume, the further corrigenda and addenda for the remaining five volumes to come out with the synonymy in a seventh volume.

In the present volume I have had the advantage of working with Mr. Robinson on certain groups, whilst the magnificent collection of well-made skins of birds, with excellent data, which he has brought home with him has helped to elucidate many points hitherto doubtful on account of the paucity of material for examination. I have also to thank this gentleman for assistance in proof reading and for much important information on Malaysian Birds.

To Messrs. H. F. and G. Witherby my thanks are due for permitting the reproduction of the plate of *Chalcophaps indica indica* by Lodge, which originally appeared in 'Indian Pigeons and Doves.' As usual the Authorities at the Natural History Museum have done everything possible to facilitate my work and have given me the constant assistance without which it would have been impossible to have brought out the various volumes at such short intervals.

E. C. STUART BAKER.

March 1928.

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Fig. 1. *Haliastur i. indus.*

Order III. ACCIPITRES.

The diurnal Birds of Prey form a natural and comparatively well-marked group showing, especially in our Indian forms, characters separating them from all others. It is true that the Harriers superficially show certain resemblances to the Owls, which may, indeed, constitute a definite link with the *Striges* but, at the same time, not even a child could fail to distinguish between an Owl and any member of the present Order.

In the Accipitres the bill is strong; the upper mandible considerably longer than the lower, with the culmen curved, the tip hooked and its outer edge perpendicular; the basal portion is covered with a cere in which the nostrils are pierced. The feet are strong, furnished with powerful claws. A hallux is always present and there is a tufted oil-gland. The spinal feather-tract is well defined on the neck. The wing has eleven primaries. The *flexor longus hallucis* leads to the hallux and the *flexor perforans digitorum* to the other three digits but the two tendons are united by a fibrous vinculum. The ambiens muscle and the femoro-caudal

are present, the accessory femoro-caudal, semitendinosus and accessory semitendinosus are absent. There are no basipterygoid processes and the palate is desmognathous. Both carotids are present and there are cæca of the intestine.

Key to Families.

A. No after-shaft to feathers ..... **Pandionidæ**, p. 3.

B. An after-shaft present.

a. Crown of head covered with down or naked ..... **Ægypiidæ**, p. 6.

b. Crown of head covered with feathers .... **Falconidæ**, p. 25.

Family PANDIONIDÆ.

It is with considerable doubt that I retain *Pandion* in a Family by itself, as some of its characters, hitherto held to be quite distinctive, are possibly shared by some of the *Falconidæ*. Thus the reversible outer toe is possessed in a great degree by *Icthyophaga* (*Polioaëtus* auct.) and to a less extent by *Cuncuma*. The characters of the tarsus and metatarsus are found in part in the genus *Circus*. Every genus of the *Falconidæ*, as restricted by Blanford, has, however, an after-shaft to the feathers and the absence of this character in *Pandion* may suffice to retain it for the present in its family status. It seems to form a link in some respects between the Owls and the true *Falconidæ*. The family contains but one genus.

Genus **PANDION**.

Pandion Savig. Descr. de l'Egypte, Ois., i, pp. 69, 95 (1809).

Type, *Falco haliaëtus* Linn.

In this genus the bill is moderate, the tip long and greatly hooked; festoon variable; nostrils small, narrow and oblique; the tarsus is short and very powerful, reticulated throughout except on the extremity of the toes alone; toes also very powerful with prickly scales on the soles and with long, subequal claws, which are strongly curved; wings very long and pointed, the third longest and the first between the fourth and fifth or equal to the latter; tail almost square.

(1704) **Pandion haliaëtus haliaëtus.**

THE OSPREY.

Falco haliaëtus Linn., Syst. Nat., 10th ed. i, p. 91 (1758) (Sweden).
Pandion haliaëtus. Blanf. & Oates, iii, p. 314.

Vernacular names. *Machariya, Machmanga* (Hin.); *Macharang* (Nep.); *Machmoral, Bala* (Beng.); *Koramin gedda* (Tel.); *Hegguli* (Yerkli); *Verali-addi-pong* (Tam.); *Pantiong* (Lepcha); *Woon-let* (Burm.).

Description. Head and neck white, the centre of the crown and nape broadly streaked with dark brown; a broad band from the eye, including the posterior ear-coverts, down the sides of the neck dark brown; upper plumage dark brown, the central tail-feathers tipped paler or whitish; outer tail-feathers banded with paler brown on the outer and with whitish on the inner webs; wing-quills blackish brown; lower plumage white, boldly streaked with dark brown or fulvous-brown on the breast and, except in

very old birds, narrowly streaked with dark brown on the sides of the chin and throat; under wing-coverts brown mottled with fulvous-white.

In very old birds the bars on the tail become fainter and obsolete.

Colours of soft parts. Iris yellow or golden yellow; eyelids livid greenish or greenish-blue; bill black, the cere and gape dull greenish-blue; legs pale greenish or yellowish, claws black.

Measurements. Wing, ♂ 452 to 495 mm., ♀ 468 to 508 mm.; tail, ♂ 191 to 223 mm., ♀ 204 to 220 mm.; tarsus about 59 to 65 mm.; culmen 37 to 39 mm.



Fig. 2.—Foot of *Pandion h. haliaëtus*. ½.

Young birds have the feathers of the upper parts and wing-coverts boldly edged with white or fulvous-white; the breast is sometimes less marked with brown and the head, neck and face more heavily marked with dark brown.

Distribution. Practically the whole of India, Burma and Ceylon in Winter, either on the sea-coasts or wherever there are wide stretches of lake or swamp. In Summer it is found over nearly the whole of Europe and Asia, whilst it also breeds in Northern Africa, Cape Verde Islands, the Himalayas and, casually only, in the plains adjacent to the Himalayas.

Nidification. In Europe the Osprey breeds in April and May, sometimes into the early part of June, laying two or three eggs, occasionally four. The nests are huge structures of sticks added to year after year, for they are occupied many years in succession, and placed high up on some big tree or rock, or upon the edge or side of a cliff. Sometimes there is no lining, sometimes there is a

deep pad of leaves, rushes, weeds, etc. and at times all these materials together with sea-weeds form part of the nest itself. The eggs are very handsome. The ground is white, yellowish-white or pinkish, rarely a comparatively warm pink or salmon. The primary markings are all shades of deep red, red-brown, or purple-brown, usually numerous everywhere and sometimes forming more or less of a cap at the larger end. The secondary markings are inky-grey, lavender, or pale purple. A few eggs have the markings confined almost entirely to the larger end. One hundred eggs average 61·6 × 46·3 mm.: maxima **69·0** × 46·0 and 68·4 × **50·3** mm.; minima **50·4** × 41·3 and 55·2 × **40·2** mm. (*Jourdain*).

In India this bird undoubtedly breeds in the Himalayas and casually in the Plains. Parker took a single egg from a nest built on a lofty tree in the Botanical Gardens in Calcutta and a pair also bred for many years in Cachar, the nest being built in a tree on an island in the centre of a vast swamp. Three eggs from this nest measure 61·1 × 46·0, 62·0 × 45·2 and 61·0 × 46·8 mm.

Habits. The Osprey is only found on the sea-coast or on large pieces of inland waters and swamps, for its food is almost entirely fish. It surveys its domain from some lofty position and thence sails over the water, plunging with closed wings on its prey and often diving completely under water. It will seize and carry off fish of great size and is said occasionally to be drowned in attempting the capture of fish beyond its strength.

Family ÆGYPIIDÆ.

As the generic name *Vultur* is applicable to an American genus not represented in India or among the Old World Vultures, it is impossible to employ it as the basis of the Family name and the next oldest, *Ægypius*, must therefore be made use of.

The Vultures differ from the Falcons, Eagles and Hawks in having the head and neck bare, or only partly covered, with short down and in never having any true feathers on the crown.

The crop is covered with short fluffy feathers and there is generally a more or less distinct ruff at the base of the naked neck; the bill is strong, less markedly so in *Neophron*, deep and compressed with the culmen much curved; the tip is deeply hooked and the cere large and horny; there are fifteen cervical vertebræ, one more than is usual in the *Falconidæ*; the wings are long and pointed, the third or fourth longest or subequal and the first reaching nearly to the tip of the wing; there are twelve or fourteen rectrices; the tarsi are partly feathered, the naked portion covered with granular scales, the final upper portions of the toes with broad scutulæ; the central toe is long, the inner and outer toes subequal, the middle and outer being joined for half the length of the latter with a membrane; claws long but not much curved.

The family has genera extending throughout the tropical and warm temperate countries of Europe, Africa and Asia.

Key to Genera.

A. Bill stout.
  a. Nostril round or oval; tail-feathers twelve.
    a'. No wattle on the neck..... ÆGYPIUS, p. 7.
    b'. A fleshy wattle on either side of the neck SARCOGYPS, p. 8.
  b. Nostril a narrow vertical slip.
    c'. Tail-feathers fourteen ..... GYPS, p. 10.
    d'. Tail-feathers twelve ..... PSEUDOGYPS, p. 19.
B. Bill slender; nostrils elongate and horizontal. NEOPHRON, p. 21.

Genus ÆGYPIUS.

Ægypius Savigny, Descrip. de l'Egypte, Ois., i, pp. 8, 13 (1809).

Type, *Vultur monachus* Linn.

In *Ægypius* the bill is comparatively short, very strong, deep and curving from the cere; nostrils round; head broad and covered with down, short on the crown, longer on the nape; neck naked, the ruff present, not very conspicuous but reaching up to the back of the neck.

(1705) Ægypius monachus.

THE CINEREOUS VULTURE.

Vultur monachus Linn., Syst. Nat., 12th ed. i, p. 122 (1766) (Arabia *in err.*, Palestine); Blanf. & Oates, iii, p. 317.

Vernacular names. *Kala-gidh* (Hin.); *Gat-panom* (Lepcha).

Description. Dark brown throughout, the wing-quills and tail blackish; underparts very variable, sometimes paler and more fulvous in younger birds, sometimes very dark in the oldest; the thigh-feathers are always very dark, whilst the under tail-coverts and the bases of the ruff-feathers are paler. Bleaching of the feathers after the moult is very rapid and in a very few weeks the dark freshly moulted plumage, which often has a ruddy sheen on the upper parts, becomes paler and glossless.

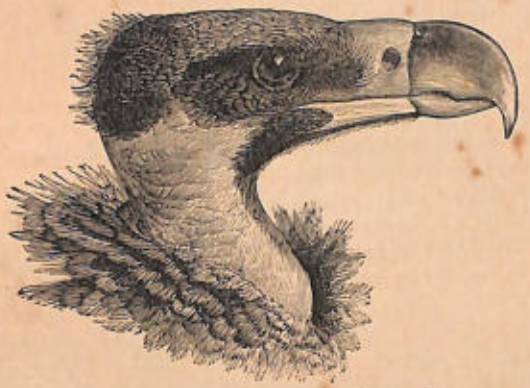


Fig. 3.—Head of *Æ. monachus*. ½.

Colours of soft parts. Iris brown; bill blackish-brown, sometimes yellowish at the base and on the lower mandible; cere pale mauve or plumbeous-grey; legs and feet creamy or yellowish-white or pearl-white; naked skin of neck livid flesh-colour.

Measurements. Wing 756 to 843 mm.; tail 350 to 400 mm.; tarsus about 132 to 146 mm.; culmen about 80 to 88 mm.

Young birds are paler and browner.

Distribution. South Europe, Northern Africa, East through South-West and South-Central Asia to India; Ningpo in China. In India it is found throughout the Himalayas from the extreme West to Eastern Assam, where I have seen individuals both in Dibrugarh and in Cachar. It occurs in Winter in the Punjab, Sind, North-West Provinces, United Provinces and as far South as Ahmedabad, Mhow and Saugor. A specimen was also shot in Calcutta feeding on offal from the municipal slaughter-houses.

Nidification. In Europe the Cinereous Vulture breeds in March and April, making a huge nest of sticks built either high up in a tree or on the ledge of a cliff. One egg only is laid and the records of two are extremely doubtful. In India Major Marshall took several eggs near Quetta from February to early April and Williams has recently taken others in the Marachuk and other gorges near the same place. From Central Asia also I have eggs taken early in April. In North Cachar the only pair I knew of bred in December and early January and an egg brought to me from Bhutan was also laid during the last ten days of December. Ten Asiatic eggs, including six from India, average 89·9 × 69·6 mm.: maxima **92·5 × 72·5** mm.; minima **88·0 × 65·0** mm. In colour they vary as greatly as those of the European bird. Some are pure, spotless white and they range from this to eggs almost as dark and uniformly blotched as those of the Peregrine. Some are blotched and splashed all over with rich blood-red or deep brown, others spotted and marked with the same in lesser and varying degree, whilst occasionally they are marked only with violet and pale neutral tint. Generally speaking they are extremely handsome eggs.

Jourdain gives the average of ninety European eggs as 91·8 × 68·8 mm.: maxima **107·0** × 68·6 and 99·0 × **76·0** mm.; minima **83·4** × 68·0 and 88·0 × **56·0** mm.

Habits. This Vulture, though so grand a bird, is quite typical of the family in all its ways, eating nothing but carrion and offal and fearing to attack or kill the weakest of animals unless dying. It, however, keeps other Vultures at a distance when feeding, driving them from the carcase on which it wishes to dine. As a rule they are either solitary birds or consort in pairs but occasionally may be found feeding together in small parties. Their notes vary from the querulous mewing indulged in by all Vultures when feeding to much louder squalling and roaring when fighting or during the excitement of the breeding-season.

Genus **SARCOGYPS.**

Sarcogyps Lesson, Echo du Monde (1832).

Type by monotypy, *Vultur ponticerianus* Lath. = *V. calvus* Scops.

This genus is distinguished by possessing a large wattle of skin behind and below each ear; the skin of the head and neck is bare, without any down; the ruff is even smaller than in *Ægypius*.

It contains one species, *S. calvus*.

Otogyps, 1841, used by Blanford, is antedated by *Sarcogyps*, 1832; *Torgos*, an African genus wattled like *Sarcogyps*, has narrow, lanceolate feathers to the under plumage, not broad and rounded as in our Indian bird.

(1706) Sarcogyps calvus.

THE BLACK, OR PONDICHERRY, VULTURE.

Vultur calvus Scop., Del. Flora et Faun. Insubr., ii, p. 85 (1786) (Pondicherry).
Otogyps calvus. Blanf. & Oates, iii, p. 318.

Vernacular names. *Raj-gidh, Mulla-gidh, Bhaonra* (Hin.); *Raj Shagon* (Beng.); *Raj-hogon* (Assam); *Loong-nong-loong* (Lepcha); *Nella Borawa* (Tel.); *Rannapanta* (Yerkli).

Description. A ring of black feathery bristles round the ear and a few scattered black bristles on the cheeks, lores and sides of the crown; general plumage above glossy black, the scapulars, rump and lower back browner; secondaries pale brown with black tips; crop-patch brown, ruff and lower plumage black, the feathers with white bases which show through everywhere; upper thighs and posterior flanks covered with white downy feathers.

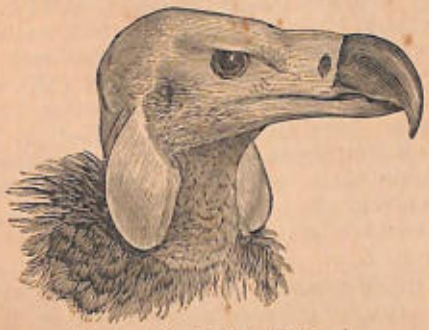


Fig. 4.—Head of *S. calvus.* ½.

Colours of soft parts. Iris yellow, red-brown or crimson; bill dark brown, yellowish at the base of the lower mandible; cere, bare skin of head and neck deep yellowish-red; wattles often more red; bare skin on either side of the crop and inside the thighs duller yellowish-red; legs dull livid-fleshy to dull red.

Measurements. Wing 600 to 625 mm.; tail 226 to 257 mm.; tarsus 108 to 116 mm.; culmen 74 to 80 mm.

Young birds have the crown covered with white down and a certain amount of light brown down on chin, throat and crop-patches; the general plumage is brown above, the feathers with paler edges; quills and tail darker brown, the former nearly black; below the crop is white; breast, anterior flanks and abdomen pale brown; posterior flanks and abdomen, vent and under tail-coverts white.

Distribution. Throughout India and Burma but not in Ceylon; it is also found East and South into Siam, Cochin China, and the Malay Peninsula.

Nidification. The Black Vulture breeds in Western and Southern India principally in February and March, though eggs have been taken as early as October and again in December. In Eastern India the principal breeding months are December and January. This Vulture invariably makes its nest on trees or, where these are scarce, on high bushes, cacti, etc.; never, so far as authentic records go, do they build them on cliffs. The nest may be anything from two to four feet in diameter and from six to eighteen inches or more in depth and is built of sticks and branches, normally well lined with green leaves and branches, less often with straw, grass or rubbish.

In most cases the nest is built in trees in orchards, village surroundings, or open cultivated country but occasionally in forest or thin scrub- and tree-jungle. Both birds assist in building the nest but as a rule the male brings the material and the female constructs the nest. Only one egg is laid and this is always pure white. Hume obtained one egg very faintly flecked with reddish but among the hundreds I have personally seen I have only come across one, taken by Howard Campbell, which was marked at all, though this particular specimen is very handsomely blotched and spotted with red. Sixty eggs average 83·9 × 66·0 mm.: maxima **89·5** × 65·3 and ? × **71·1** mm. (*Hume*); minima **79·5** × 64·5 and 79·6 × **61·5** mm. Incubation takes 42 to 47 days.

During the hottest hours of the day neither bird sits on the egg, at night the male seems always to be on the nest and in the mornings and afternoons the female. The birds pair either on the nest or on one of the branches adjoining and the ceremony is always attended by extraordinary roarings, uttered by both sexes. The female seems to be the more prominent of the two birds in making advances prior to copulation. In Eastern Bengal, where they are unusually common, I have known two nests on adjacent trees but usually each pair has a wide territory to itself.

Habits. The Black or King Vulture, as this bird is commonly called, is scattered widely all over the Indian Empire but is nowhere seen in flocks like the Common Vulture; I once saw eight, probably four pairs, feeding on a dead Gaur, but usually they are only seen in pairs or alone. Although smaller than most of the other Vultures it is far bolder, more pugnacious and more powerful and its arrival at a carcase is the signal for the dispersion of the Vultures already assembled and feeding, who take up their position at a little distance until his majesty is gorged. On the ground his movements are more dignified though easier and quicker, whilst in the air his flight is equally graceful and picturesque.

Genus **GYPS.**

Gyps Savigny, Descrip. de l'Egypte, Ois., i, pp. 8, 11 (1809).

Type, *Gyps vulgaris* Savigny = *G. fulvus fulvus* Habl.

The genus *Gyps* is distinguished from *Sarcogyps* in having no earlappets; the head is narrower and longer in proportion and the bill more slender and longer; the nostril is very narrow and vertical or slightly oblique; the ruff at the base of the neck is well developed, consisting of long, narrow feathers. From *Sarcogyps*, as from all other Indian Vultures, it is also separated by possessing fourteen tail-feathers.

The genus is represented throughout Africa, Southern Europe, South-West and Central Asia.

Key to Species.

A. Bill larger and less slender; depth of base of bill equal to length of cere.	
a. Lower plumage with narrow shaft-stripes.	*G. fulvus*, p. 11.
b. Lower plumage with broad shaft-stripes.	*G. himalayensis*, p. 13.
B. Bill smaller and more slender; depth of base less than length of cere	*G. indicus*, p. 15.

Gyps fulvus.

Key to Subspecies.

A. Prevailing tint a golden rufous	*G. f. fulvescens*, p. 11.
B. Prevailing tint isabelline in old birds, brown or buff in young ones	*G. f. fulvus*, p. 13.

(1707) Gyps fulvus fulvescens.

THE INDIAN GRIFFON VULTURE.

Gyps fulvescens Hume, Ibis, 1869, p. 356 (Gurgaon, Punjab).
Gyps fulvus. Blanf. & Oates, iii, p. 320.

Vernacular names. None recorded.

Description. Crown thickly covered with white hair-like feathers, more sparse and bristly on sides of head, chin and throat; upper neck covered with white down, becoming thinner and more bristle-like on the fore-neck; ruff golden fulvous, the feathers long and lanceolate with pale fulvescent central streaks; upper plumage fulvous, varying considerably in shade; in some pinkish, in others browner, in others again more fawn; in all, however, with paler edges and pale shaft-lines; rump and shorter upper tail-coverts paler fulvous; greater and primary wing-coverts dark brown, edged paler when in fresh plumage; primaries and tail dark brown or blackish-brown; lower parts bright fulvous, pinkish brown or ochraceous, each feather with a narrow pale shaft-line. Very old birds obtain a pure white ruff of downy feathers.

Colours of soft parts. Iris yellow-brown to brown; bill yellowish or greenish-horny to dusky brown, sometimes paler along the edge of the culmen; cere black; legs and feet dirty yellow to greenish-grey.

Measurements. Wing 675 to 740 mm., both extremes ♂; tail 302 to 330 mm.; tarsus about 100 to 120 mm.; culmen 71 to 74 mm.

Young birds are darker-coloured throughout and much less streaked, especially on the upper plumage, which is almost uniform dull fulvous-brown or even dark brown; the feathers of the ruff are brown with pale centres and are less narrow and lanceolate than in the more adult birds.

Distribution. This Vulture is common over the greater part of the North-West but is replaced in Afghanistan and Baluchistan by the typical race. It extends South to Khandesh and the Deccan and East to the plains of West Assam, where it is a non-breeding straggler only; it was also recorded from Manbhoom by Ball and was seen by Blanford on the banks of the Godavery near Dumagudem and is not rare in Behar and Orissa. In Kashmir it is common up to some 6,000 feet.

Nidification. The Indian Griffon breeds in small colonies on ledges of cliffs, making rough nests of sticks, branches and rubbish, which are occupied for many years in succession unless blown away in the Monsoon gales, when they are rebuilt on the same site. A single egg is laid, generally all white, rarely faintly spotted or blotched with pale reddish and, exceptionally, really well marked. As incubation advances the eggs get very filthy and stained. Twenty-five eggs average 90·7 × 70·2 mm.: maxima **97·0** × 72·0 and 95·0 × **73·0** mm.; minima **83·8** × **65·0** mm.

The number of pairs in a colony varies from half-a-dozen to about twenty. The breeding-season is November to early March in the plains, February to early April in Kashmir.

Habits. This Vulture is always gregarious both in the breeding- and non-breeding-season but is nowhere seen in the same numbers as that in which *Pseudogyps* collects. It feeds entirely on carrion and has the usual disgusting habits of its tribe, feeding to repletion when the opportunity occurs and often, when forced to fly immediately after its repast, disgorging part before it takes to wing. When feeding in company with other Vultures, whether of its own or other species, it keeps up a continuous querulous mewing and squabbling, yet is never brave enough to make a real fight. On the ground it proceeds by ungainly hops and rarely runs, whilst if in great haste it assists its legs with flaps of its wings. In the air its flight and wonderful soaring powers are as imposing as those of other Vultures. The smell of these birds is so overpowering, even when just killed, that no native cares to undertake the job of skinning them, so that skins of even the most common Vultures are not numerous in Museums.

(1708) Gyps fulvus fulvus.

THE EUROPEAN GRIFFON.

Vultur fulvus Habligl., N. Nordische Beytr., iv, p. 58 (1783) (Gilan, N. Persia).
Gyps fulvus. Blanf. & Oates, iii, p. 320 (part.).

Vernacular names. None recorded.

Description. The fully adult bird is far more isabelline than our Indian Plains race and birds at all stages are less golden-rufous than are *G. f. fulvescens*. Again, old birds, probably at four years of age upwards, acquire a pure white fluffy ruff, hardly ever seen in the plains form.

Colours of soft parts as in *G. f. fulvescens*.

Measurements. Wing 700 to 715 mm.; tail 302 to 380 mm.; tarsus about 100 to 110 mm.; culmen 71 to 74 mm.

Young birds appear to be a much darker brown than young of *G. f. fulvescens* of a similar age and have no golden-rufous tinge at all and very little buff.

Distribution. South Europe, Western Asia to Turkestan, Persia, Afghanistan and Baluchistan. In India it occurs as a montane bird as far east East as Sikkim and, almost certainly, Bhutan, whence I have seen a specimen I attribute to this race with a pure white ruff. The specimens from Africa, the Red Sea Province of the Sudan and Dabeta form another race named by Schlegel *G. f. occidentalis*.

Nidification. The European Griffon breeds from the end of January to March, occasionally eggs, probably second layings, being found in April. Like the Indian form it breeds normally in colonies on cliffs but is said sometimes also to make use of nests of other birds built in trees. Only one egg is laid, which is generally all white, rarely spotted and blotched with reddish-brown. Sixty eggs average 92·0 × 71·0 mm.: maxima **101·2** × 73·8 mm. and 94·0 × **75·0** mm.; minima **81·5** × 65·0 and 85·0 × **64·5** mm. Incubation is said to take 50 days.

Habits. Those of the genus. Its status in India is doubtful and there is nothing to show whether it is a resident bird or merely occurs as a rare straggler. Kashmir birds apparently are all *fulvescens* but the specimens I have been able to examine are all from low levels and Northern birds may prove to be true *fulvus*.

(1709) Gyps himalayensis.

THE HIMALAYAN GRIFFON.

Gyps himalayensis Hume, Rough Notes, i, p. 12 (1869) (Simla); Blanf. & Oates, iii, p. 321.

Vernacular names. *Barra Gid* (Chamba).

Description. Head and upper neck covered with dirty yellow hair-like feathers, these turning whiter and more downy on the lower neck; feathers of ruff long and lanceolate, pale buff or fulvous with central whitish shaft-streaks; on the chest these feathers turn to dense white down, running completely round the light brown breast-patch; upper parts and wing-coverts pale fulvous-brown, the centres of the feathers browner and showing up in irregular patches; outer greater coverts, wing-quills and tail dark brown, the inner secondaries tipped paler; feathers of "shirt-front" with faint pale streaks; lower parts fulvescent, darker on the breast and almost white on the vent and lower tail-coverts, with faint central streaks which show fairly plainly on the darker breast.

In some individuals there is a distinct isabelline tinge on the scapulars and back; the depth of colour varies very greatly and it probably takes several years for the palest plumage to be attained.

Colours of soft parts. Iris dull yellow or creamy-yellow to pale brown; bill horny-green, dull yellowish-horny or yellowish-plumbeous; cere pale brown or greenish-brown; legs and feet dingy greenish-grey or white.

Measurements. Wing 755 to 805 mm.; tail 365 to 402 mm.; tarsus about 110 to 126 mm.; culmen 71 to 77 mm. (one Tibet, 81); mid-toe and claw 121 to 135 mm.

Young birds have the feathers of the head much more downy; the upper parts are dark brown, the back, scapulars and wing-coverts boldly streaked with fulvous-white; the primaries and tail blackish-chocolate; below the "shirt-front" is dark brown, the feathers streaked paler and the whole of the lower parts chocolate-brown with bold whitish shaft-stripes.

Between the darkest very young birds and the oldest pale fulvous ones every stage of colour may be met with.

Distribution. Throughout the Himalayas from Afghanistan to Western Assam and North to Turkestan and Tibet.

Nidification. The Himalayan Griffon breeds from January to March. Ward, however, took fresh eggs in April and I have received one taken on the 9th May, an egg laid in a solitary nest from which an egg had been taken the previous February. The nests, like those of the two preceding Vultures, are built on cliffs in colonies and, like them also, are used year after year. The eggs, of which one only is laid, are, in the majority of cases, unspotted white, but a good many are faintly marked and a few handsomely blotched, with pale reddish to deep reddish-brown. Fifty eggs average 94·8 × 70·1 mm.: maxima **103·6** × 71·2 and 94·7 × **74·0** mm.; minima **89·2** × 68·9 and 96·0 × **65·0** mm. They are longer eggs in proportion to their size than most of our other Indian Vultures' eggs.

Habits. The Himalayan Griffon is entirely a mountain form, being most common between 4,000 and 8,000 feet but occurring

at much greater height than this. Scully records that it is very common in Gilgit over 10,000 feet and both he and Marshall noticed it soaring over the snowy ranges, whilst Wollaston found it common up to 14,000 feet in Tibet. It is a scavenger, feeding almost entirely on carrion following caravans for the purpose of feeding on the dead horses, etc. At the same time it is said not to frequent the vicinity of villages like most Vultures. In flight the contrast between the white under body and black wings is said to be very conspicuous.

Gyps indicus.

Key to Subspecies.

A. Crown of head well covered with hair-like feathers.
  a. Smaller, wing under 680 mm. ..... *G. i. indicus*, p. 16.
  b. Larger, wing over 690 mm. ..... *G. i. jonesi*, p. 18.
B. Crown of head almost or quite bare..... *G. i. nudiceps*, p. 17.

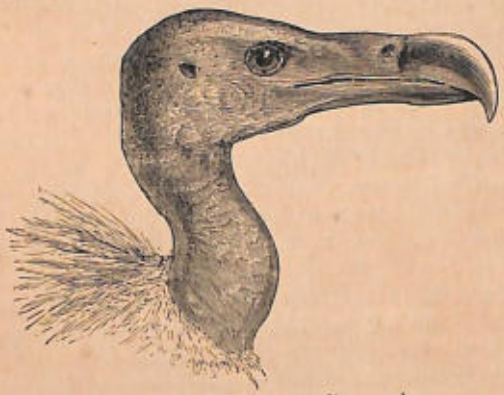


Fig. 5.—Head of *G. i. nudiceps*. ½.

It is with some doubt I retain *G. i. jonesi* as a race of *indicus* as it differs in several respects from that bird, notably in its heavy bill and tarsus. Further material may show that it is entitled to specific rank but at present there are only three specimens available for examination. Its large bill and powerful feet show a close affinity to *Gyps fulvus* and it may be that it is a dark race of this species inhabiting the hill ranges of the Punjab, though it would be very remarkable for an isolated race to occupy an area in the centre of that of another race. The name *tenuirostris* of Hume cannot be used for the Northern race of this Vulture. *Tenuiceps* of Hodgson is a *nomen nudum* and Grey (1846) again gives it as a *nomen nudum*. Next Grey gives both *tenuiceps* and *tenuirostris* as synonyms of *indicus* (Hand-List, i, p. 2, 1869), so that it was not available for Hume to use in 1878. I, therefore, have given it the new name of *G. i. nudiceps*, referring to its extraordinarily bald head and neck.

(1710) Gyps indicus indicus.

THE INDIAN LONG-BILLED VULTURE.

Vultur indicus Scop., Del. Flor. et Faun. Insubr., ii, p. 85 (1786) (Pondicherry).
Gyps indicus. Blanf. & Oates, iii, p. 322.

Vernacular names. *Gidh* (Hin.); *Gidad, Maha-dho* (Mahr.).

Description. Whole head and nape with short hair-like feathers, pale whitish-brown to brown, scattered thinly over the surface; upper neck more or less clothed with white downy feathers, lower part of the neck generally more naked; ruff pure white, extending from round the back of the neck and round the rich brown breast-patch; the feathers of the ruff disintegrated and fluffy; back pale brown, the centres, mostly concealed, darker; lower back, rump and upper tail-coverts creamy-white with pale brown bases, sometimes showing extensively, sometimes hardly visible; wing-coverts and scapulars like the back but paler and with the dark centres in greater contrast; quills and tail dark brown or blackish; lower parts pale dirty fulvous, sometimes almost white, sometimes slightly isabelline on the breast and generally showing faint traces of still paler central streaks; under wing-coverts mottled brown and creamy-white.

Colours of soft parts. Iris brown; bill greenish or yellowish-horny, darker on the culmen; cere dull, dirty greenish; bare skin of head and face plumbeous-ashy; legs and feet greenish or plumbeous-ashy.

Measurements. Wing 560 to 650 mm., nearly all between 600 and 625 mm.; tail 238 to 274 mm.; tarsus about 90 to 94 mm.; culmen 66 to 69 mm.

Young birds are much darker and browner than the adults and in some cases boldly streaked both above and below with pale buff or whitish; the ruff consists of long lanceolate buff to brown feathers, boldly streaked with paler; the breast-patch is generally a paler brown.

Distribution. Practically all India South of the Indo-Gangetic plain. It does not occur in Ceylon nor in Sind.

Nidification. This Vulture breeds during December and January, laying a single egg in large stick nests built on ledges of rock on cliff-sides, or on the summits and sides of outcrops of rocks. It apparently never breeds on trees and the nests and eggs recorded by Parker were undoubtedly those of *G. nudiceps*, which breeds in these same colonies to the present day. One egg only is laid, the majority white or nearly so but a considerable number are quite well marked with reddish or red-brown blotches, occasional eggs are quite handsome. Twenty eggs average 86·6 × 67·3 mm.: maxima **91·5** × 68·5 and 84·6 × **68·6** mm.; minima **81·6** × **64·2** mm.

Habits. Much the same as those of other Vultures; birds of wonderful flight and awkward movements on the ground; evil smelling, voracious but cowardly scavengers, never assaulting other living creatures except when they are on the point of death. In parts of Southern India they often collect in numbers over carcases but not in the multitudes in which the White-backed Vulture is often seen.

(1711) Gyps indicus nudiceps.

THE NORTHERN LONG-BILLED VULTURE.

Gyps indicus nudiceps Stuart Baker, Bull. B. O. C., xlvii, p. 151 (1927) (Nepal).
Gyps tenuirostris Hume, Str. Feath., vii, p. 326 (1878) (Nepal); Blanf. & Oates, iii, p. 323.

Vernacular names. *Sagun* (Beng.); *Hogun* (Assam); *Gut* (Lepcha).

Description. Differs from the preceding form in having the head and neck practically naked, having no hairy down on the crown and nape and either none or very little on the neck; the upper plumage is sometimes darker and browner and the underparts more brown and less fulvous; the bill is more slender with a rather larger, more open nostril.

Colours of soft parts. Iris dark brown; "bill brownish dusky horny; cere horny-black; skin of head and neck dark muddy; tarsi and toes black; claws dusky and horny-black" (*Hume*).

Measurements. Wing 590 to 630 mm.; tail 237 to 256 mm.; tarsus about 110 mm.; culmen 66 to 68 mm.

Distribution. The Lower Himalayas from Kashmir to Eastern Assam, Burma and, according to Blyth, the Malay Peninsula. It is extremely common in parts of Assam and almost equally so in Eastern Bengal throughout the plains. It also extends into the plains of Northern India but is much less common than further East and its exact limits to the South have not been defined.

Nidification. The Northern race of Long-billed Vulture breeds from the middle of November to the end of February and builds its nest on trees, not on cliffs, even when these are available. The nest is like that of the other Vultures which breed in similar places, great structures of sticks and branches, used for several years but always renewed and lined with green branches and leaves. Parker found them breeding in colonies in the 24th Parganas and I found large colonies in Assam and Eastern Bengal, though in no case did I find more than one nest in any tree. Some were built low down, some at inaccessible heights in huge Cotton-trees. Only one egg is laid, like that of other birds of the genus but, as a series, better marked and I have

one or two which are more like well-marked Eagle's eggs than those of Vultures. One hundred eggs average 84·7 × 63·6 mm.: maxima **91·8** × 65·4 and 90·7 × **67·9** mm.; minima **76·1** × 62·8 and 78·4 × **59·9** mm.

Habits. Those of the genus. It is one of the Vultures which haunt the vicinity of villages and breed on the trees round about them.

(1712) Gyps indicus jonesi.

THE HIMALAYAN LONG-BILLED VULTURE.

Gyps indicus jonesi Whistler, Bull. B. O. C., xlvii, p. 74 (1927) (Rawal Pindi).

Vernacular names. None recorded.

Description. "Differs from *G. i. indicus* in its larger size, darker coloration and thicker covering of the head and neck. The body-plumage is a dull earthen-brown colour with faint shaft-stripes, this colour being duller and darker even than in *G. fulvus* or *G. himalayensis*. The crop-patch is a more sooty-brown than in *G. indicus* and the rump is brown slightly marked with white as opposed to the white rump flecked with brown in the typical form. The head is clothed with thick buffy-white hairs and the neck with thick white down, as thickly as in *G. fulvus* or *G. himalayensis*. Ruff white tinged with buff, the feathers short and downy, as in the typical form."

Colours of soft parts. Apparently the same as in the other races.

Measurements. Wing 700 to 750 mm.; tail 300 to 310 mm.; tarsus 100 to 109 mm.; culmen about 71 to 74 mm.; depth 35 to 36 mm.

Distribution. Lower ranges of hills, 1,500 to 2,500 feet between the Salt range and the Indus.

Nidification. Mr. A. E. Jones, the discoverer of this fine Vulture, found a colony breeding on a cliff of a low range of hills known as the Kala Chita Reserve, near Campbellpur, West Punjab. The nests were "rather scanty, composed of twigs with the leaves still adhering to them and a small quantity of dried grass, measuring from two to two-and-a-half feet in diameter. The nests were placed 20 to 30 feet apart on separate and distinct ledges but the whole cliff-face was whitewashed with their droppings and they had evidently occupied this breeding-place for many years."

Habits. Similar, so far as is known, to those of other Vultures of the genus *Gyps*. This Vulture is probably a form restricted in its breeding-area to the low hills at the foot of the North-Western Himalayas.

Genus **PSEUDOGYPS.**

Pseudogyps Sharpe, Ann. Mag. Nat. Hist. (4) xi, p. 133 (1873).

Type, *Vultur bengalensis* Gmelin.

The genus *Pseudogyps* differs from the other Vultures in having 12 tail-feathers instead of 14. The genus contains two species, one Indian and one African.

(1713) **Pseudogyps bengalensis.**

THE INDIAN WHITE-BACKED VULTURE.

Vultur bengalensis Gmelin, Syst. Nat., i, p. 245 (1788) (Bengal).
Pseudogyps bengalensis. Blanf. & Oates, iii, p. 324.

Vernacular names. *Gidh* (Hin. & Mahr.); *Ságún, Changoon* (Beng.); *Guli-gadu, Mati-pudum-gudu* (Tel.); *Walhorya* (Yerkli); *Karru* (Tam.); *Lin-tah* (Burma).

Description. Head and fore-neck almost nude, only sparsely speckled with fine yellowish hairs; hind neck with tufts of dirty white downy feathers; interscapulars, scapulars, wings and tail dull blackish, the secondaries and inner primaries generally browner and paler; ruff of short downy feathers, usually lanceolate and less downy on the back of the neck, pale fulvous to pure white, extending round the deep chocolate-brown shirt-front; feathers of the latter indistinctly streaked paler; lower back, rump, upper part of flanks, inner wing-coverts, axillaries and thigh-coverts white; breast, abdomen and under tail-coverts dark brown with pale shaft-streaks.

Colours of soft parts. Iris yellowish-brown or pale brown; bill dark plumbeous or greenish-plumbeous, the culmen greyish or yellowish-white; cere shining horny-black; legs and feet greenish-plumbeous or greyish-plumbeous to almost black; the naked skin of the head and neck is dusky plumbeous.

Measurements. Wing 535 to 578 mm.; tail 217 to 232 mm. tarsus 108 to 124 mm.; culmen 71 to 81 mm.; mid-toe and claw 121 to 136 mm.

Young birds have the head and neck much more covered with hairs and down; the ruff has the feathers less downy, more lanceolate and much longer and of a darker brown with broader whitish streaks; the lower back and rump, etc., dark brown instead of white and the plumage generally much paler, more brown and not blackish.

Distribution. Common throughout nearly the whole of India and Burma but comparatively rare in the Punjab, Sind and in the desert portions of Rajputana. It also occurs in Siam, the Northern parts of the Malay Peninsula and French Indo-China.

Nidification. This Vulture breeds throughout its habitat from October to February but the great majority of eggs are laid in December and January. The nests are built on high trees round about villages and towns, less often in the open cultivated tracts at some distance from dwelling-places. Favourite trees are Pepul, Banian and Mango trees but all others are used from time to time. Sometimes the nests are solitary but more often several pairs breed near one another and sometimes there are regular colonies. Hume found fifteen nests on one tree, Dodsworth about thirty on a small clump of trees near Kanchrapara, and Scrope Doig forty on some large babool trees on an island in a swamp. These colonies are occupied for many years in succession and the trees get ruined and the surroundings made filthy with droppings, etc. One egg only is laid. Anderson took *three* eggs from one nest and *two* from another, but of course not the produce of the same bird." Most eggs are white, sometimes with a faint grey-green tinge, but a fair number are lightly spotted or blotched with varying shades of red and reddish-brown. Occasionally one obtains a really handsome egg richly marked with blotches and smears of dark reddish and with others underlying of lavender and neutral tint. One hundred eggs measured by myself average 85·8 × 64·2 mm., but sixty-eight measured by Hume average only 82·8 × 61·5 mm.: maxima **107·0** × 66·0 and 90·0 × **69·0** mm.; minima **80·5** × 64·0 and 83·0 × **61·0** mm. Abnormally small but fertile eggs, not included in the above, measure as little as 64·5 × 51·0 mm.

Incubation, I think, takes 45 days, and the chicks grunt and mew in the eggs at least two days before they are hatched.

Habits. This loathsome but very useful bird lives by scavenging only and therefore is most common in the immediate vicinity of towns and villiages in the plains of India. It finds its food only by sight and it is extraordinary how quickly kills are found and how, when found, they are devoured. A huge bull Gaur killed by me at 1 P.M., when not a Vulture was within sight of human eye, had nothing left but skin and bones at 4 P.M., when I returned to get the head. All round were Vultures gorged with meat, many on the ground almost unable to fly, others with wings semi-spread perched on the branches of adjacent trees. Possibly 200 birds were present. The majority of these had been led to the kill simply by seeing the first-comers cease their soaring and drop down to feed. They are not guided by the sense of smell, for a dead animal, well concealed by branches, may lie undiscovered until its decay can be smelt by man nearly half a mile away. Like all its kind, in flight this Vulture is majestic and the acme of graceful power but once on the ground lurching about in ungainly hops and runs, squabbling noisily with its mates, playing at tug-of-war with the entrails of some carcase, there are few more repulsive sights. It is an utter coward and beyond caterwauls, squeals and half-hearted pecks at its own fellow Vultures, it utters no protest against any marauding jackal or pariah who

drives it away from its meal. It never assaults any living creature for food unless *in extremis*, when it will attack the eyes and the softer parts of the stomach. When hard pressed it will eat worms, frogs and small lizards and the bigger beetles, locusts, etc. The stench emitted by these birds, even individuals, is very sickening and is very strong also in the nests and eggs.

It does not ascend the hills to any height, though it may make casual visits up to 5,000 feet for the purpose of feeding on carcases lying exposed in open land.

Genus **NEOPHRON.**

Neophron Savigny, Descrip. de l'Egypte, Ois., i, pp. 68, 77 (1809).

Type, *Vultur percnopterus* Linn.



Fig. 6.—Head of *N. p. ginginianus*. ½.

In this genus of small Vultures the bill is long and slender, the cere and culmen making, at first a convex or nearly straight line and then a sharply curved hook; cere very long; the nostrils large, elongate and horizontal; head and upper fore-neck and crop naked; the usual Vulturine ruff of hackles and downy feathers; wings long and pointed, the third primary longest, the first between the fifth and sixth; tail long and slightly graduated; third and fourth toes united by a web over the length of the basal phalange; claws rather long, straight and sharp.

The genus *Neophron* extends over the South Palæarctic region, Africa and Western Asia.

Neophron percnopterus.

Key to Subspecies.

A. Bill dark horny-blackish at all ages .... *N. p. percnopterus*, p. 22.
B. Bill yellow in the adults ..... *N. p. ginginianus*, p. 23.

(1714) Neophron percnopterus percnopterus.

THE EGYPTIAN, OR LARGE WHITE, SCAVENGER VULTURE.

Vultur percnopterus Linn., Syst. Nat., 10th ed. i, p. 87 (1758) (Egypt).
Neophron percnopterus. Blanf. & Oates, iii, p. 327.

Vernacular names. *Safed Gidh*, *Kol-Murghab* (Hin.).

Description. Lores with a few white bristles; sinciput nearly always with a little down running into the ruff of narrow lanceolate feathers, which commence on the nape instead of the lower neck as in other Vultures; winglet and primaries black, the inner primaries edged with grey near the lores; secondaries creamy-white, brown at the bases, tips and on the inner webs of the outer feathers; outer greater coverts brown at the base; remainder of plumage white, nearly always stained with creamy-fulvous, more strongly so on the ruff and breast than elsewhere.

Colours of soft parts. Iris yellow or dark brown; bill dusky black; cere reddish yellow; naked parts of head yellow; legs and feet dusky yellowish, claws horny-black.

Measurements. Wing 474 to 506 mm.; tail 205 to 263 mm.; tarsus 80 to 83 mm.; culmen 58 to 65 mm.; mid-toe and claw 83 to 90 mm.

Young birds have the bristles and down of the head blackish-brown; the ruff is composed of shorter, broader feathers also blackish-brown and the general plumage is dark brown, the dull white bases of the feathers of the lower plumage showing through everywhere.

At a later stage, probably after the first complete moult, the feathers of the ruff, upper back and wing-coverts are tipped with pale brown or whitish. These tips get larger at each moult, all the feathers of the underparts are edged with whitish, the dark scapulars and inner secondaries are replaced by lighter brown and pale mottlings, with occasional white feathers appearing on both upper and lower plumage.

Many individuals, otherwise in complete adult plumage, retain a brownish or fulvous wash both on the upper and lower surfaces.

Distribution. The North-West of India as far East as Delhi and South to Cutch. Outside India this Vulture extends through Afghanistan, Baluchistan and Persia to Egypt and Southern Europe. It occurs in the Canary Islands and South throughout Africa, except in the Western Equatorial Forest-region.

Nidification. The Egyptian Scavenger Vulture breeds principally in February and March, a few in January and equally few in April, the latter month more especially in the higher hills, where they are found nesting up to some 8,000 feet or perhaps a little higher. On the other hand, on the Afghan Frontier it often breeds much earlier and Pitman took one egg as early as the 14th November at Dehra Ismail Khan. It is not very

particular in the choice of a nesting-site: trees, buildings, rocks, the steep banks of rivers or the sides of cliffs, are all alike made use of. The nest when on trees is sometimes bulky, being made of all kinds of rubbish, sticks and branches, well lined with smaller twigs, grass, wool, etc. At other times, when on cliffs, it is very scanty and at times the eggs are laid on the bare earth or rock. The eggs number two or occasionally only one and are extremely handsome. The ground-colour varies from white to a light bright brick-red, whilst the markings are of every description. In some there are a few bold blotches of light red, deep reddish-brown or chocolate-black, sparse elsewhere but forming a rough cap at the larger end; other eggs have the whole surface covered with rich red blotches, smears and spots, in appearance much like immense eggs of the Peregrines. Every intermediate form is to be found but as a whole they are very richly coloured. Jourdain gives the average of 60 European eggs as 66·2 × 51·0 mm.: maxima **75·0** × 55·3 and 68·1 × **56·1** mm.; minima **58·2** × 50·0 and 73·4 × **45·0** mm.; an egg in my own collection from Spain is still broader, measuring 69·4 × **58** mm. Indian eggs average almost exactly the same.

Habits. This little Vulture, wherever found, haunts the vicinity of towns and villages and though it eats all sorts of carrion, lives principally on human excrement. Its flight, once it is up and away, is very easy, graceful and powerful and it rises into the air quicker than do its larger relatives. On the ground, also, it is less awkward, running and walking without effort and at some speed. It is a resident bird wherever found but moves locally from the highest and coldest parts of its habitat, as in the high plateaux of Persia, in Winter.

(1715) Neophron percnopterus ginginianus.

THE SMALLER WHITE SCAVENGER VULTURE.

Vultur ginginianus Lath., In. Orn., i, p. 7 (1790) (Ginga, South India).
Neophron ginginianus. Blanf. & Oates, iii, p. 326.

Vernacular names. *Safed Gidh*, *Kal Murgh* (Hin.); *Tella borawa* (Tel.); *Manju Tiridi*, *Pittri gedda*, *Papa*, *Papa purundu* (Tam.).

Description. Rather smaller than the last bird and with decidedly smaller feet and claws and with the bill quite yellow in adults.

Colours of soft parts. Bill in adults yellow, the skin of the head yellow with no red tinge, and the feet and claws paler, otherwise as in the preceding race.

Measurements. Wing 443 to 482 mm.; tail 228 to 251 mm.; tarsus 72 to 85 mm.; culmen 72 to 85 mm.; mid-toe and claw 73 to 85 mm.

Young can only be distinguished from those of the Egyptian Scavenger Vulture by their smaller size.

Distribution. A straggler in Ceylon, all India from Cape Comorin to the Himalayas except in the wettest and most heavily forested country. It extends as far as Chota Nagpore, Purulia, etc., in Bengal and is common in Behar. In the North-West it is replaced by the preceding race in Sind, the Punjab, North-West Provinces and Kashmir but the two overlap in the West of the United Provinces, Rajputana and Cutch, in which many intermediate forms occur.

Nidification. The Smaller White-backed Vulture breeds principally in March and early April but occasionally as early as the end of January or as late as early May and I found many birds breeding during this month in Chota Nagpore, whilst Sparrow took eggs on the 4th April in the Deccan. Nests and eggs differ in no way from those of the preceding bird but as a series those of the present race are decidedly less handsome and richly coloured, the majority of eggs being poorly and dingily marked. One hundred eggs average 64·3 × 49·3 mm.: maxima **71·0** × 53·8 and 62·8 × **54·0** mm.; minima **57·7** × 46·0 and 68·3 × **41·6** mm.

This race breeds from the level of the plains up to some 7,000 feet in the hills of Southern India but in Northern India, as in Behar and the United Provinces, seems to keep entirely to the plains.

Habits. The same as those of the preceding bird. I can nowhere find any description of the calls and cries of this Vulture, probably because it is on the whole a very silent bird. The usual note is a disagreeable whining mew and it gives vent to hisses and low growls when angry but it does not seem ever to roar during the breeding-season like the bigger Vultures.

Family FALCONIDÆ.

This Family contains all those genera of Indian *Accipitres* not already dealt with in preceding families and comprises the Falcons, Hawks, Kites, Eagles, Harriers and Buzzards. They are distinguished from the Vultures in having the head and neck feathered and from the Osprey in having an after-shaft to the body-feathers. *Gypaëtus*, which in habits and in many of its structural characters is very Vulturine, seems to form a link between the true Vultures and the *Falconidæ* but in virtue of its feathered head may be more conveniently retained as a subfamily of the latter.

In this family there are always 12 tail-feathers and 14 cervical vertebræ. The division of the family into groups or subfamilies has been dealt with differently by almost every Ornithologist who has reviewed them but I agree with Sclater ('Systema Avium Æthiopicarum'), who retains all under the one group, except that it seems imperative to separate *Gypaëtus* in a sub-group by itself or perhaps with the genus of African Vulturine Fish-Eagles. As regards the sequence of the genera it appears impossible to arrange any better sequence than that of Blanford, except that it seems preferable to commence with the typical genus *Falco*. It is, of course, impossible to produce any order which shall in every case lead naturally from one genus to another but in Blanford's arrangement the natural affinities between each two genera seem easier to discern than in most others.

Key to Subfamilies.

A. Bill lengthened and Vulturine in shape; claws blunt; a tuft of long bristles on the chin ..... *Gypaëtinæ*, p. 25.

B. Bill short and aquiline in shape; claws sharp and generally greatly curved; no tuft on chin..... *Falconinæ*, p. 29.

Subfamily GYPAËTINÆ.

Bill moderately high, compressed, much hooked at the end, culmen curved throughout; nostrils oval, longitudinal and concealed by long bristles directed forwards from the cere and lores; another tuft of black bristles descending perpendicularly from the chin; tarsi feathered to the toes: feet fairly strong with moderate claws, blunt and well curved; wings long and very pointed, the third primary longest and the first between the fifth and sixth; tail of twelve feathers, long and very much graduated.

The position of the Lämmergeyer seems to be one of great uncertainty. Sclater places it as one genus of his *Falconidæ*, Kirke-Swann gives it the rank of a subfamily, *Gypaëtinæ*, between the *Butioninæ* and *Aquilinæ*. To me it certainly seems to be intermediate between the Vultures and the true *Falconinæ* and to deserve the rank of a subfamily if not of a distinct family. In life-characters it is a Vulture, though a very magnificent one.

The Subfamily contains one genus, consisting of one species only, which is found in the Mountains of the Sub-Palæarctic and Æthiopian regions.

Genus GYPAËTUS.

Gypaëtus Storr, Alpenreise vom Jahre, 1781, p. 69.

Type, *Gypaëtus grandis* Storr. Switzerland.

Gypaëtus barbatus.

Vultur barbatus Linn., Syst. Nat., 10th ed. p. 87 (1758).

Type-locality: Africa, Santa Cruz.

This species has been split up into many races, five of which are accepted by Kirke-Swann *, among which are *G. b. hemachalanus*, the common Indian Himalayan bird, differing from the typical form in its larger size and from *G. b. grandis* of Southern Europe in its rather larger size and deeper coloration of the lower parts. From *G. b. altaicus* it differs in being much smaller. This latter form is almost certainly the one straggling into Assam from Tibet and Central Asia.

Key to Subspecies.

A. Smaller; wing, ♂ 726 to 815 mm., ♀ 755 to 850 mm. ..... *G. b. hemachalanus*, p. 26.
B. Larger; wing 830 to 890 mm. ..... *G. b. altaicus*, p. 29.

(1716) Gypaëtus barbatus hemachalanus.

THE HIMALAYAN BEARDED VULTURE OR LÄMMERGEYER.

Gypaëtus hemachalanus Hutton, J. A. S. B., vii, p. 22 (1838) (Simla).
Gypaëtus barbatus. Blanf. & Oates, iii, p. 328.

Vernacular names. *Argul* (Hin., Mussooree); *Okhab* (Chamba).

Description. Bristles of lores, chin and cere black, the latter with white bases; a black line round the front of the eye and over it extending back and into the occiput; crown white, more or less speckled with black; sides of the head white with black bristles in front of the face, black lines on the side of the head and a black streak below and behind the ear-coverts; upper back, shorter scapulars and inner coverts black with narrow white shaft-

* Kirke-Swann, Bull. B. O. C., xlv, p. 85, March 1925.

stripes broader at the tips; remainder of upper plumage deep silvery-grey, most of the feathers white-shafted and with black edges; feathers of the nape and neck white, more or less tinged with rufous and, especially on the nape, long and lanceolate; chin, throat and breast pale creamy-white to pale buffy-grey but almost invariaby stained rufous or deep ferruginous, the feathers of the breast broadly tipped with black forming a gorget, interrupted in the centre; abdomen, vent and under tail-coverts white, more or less tinged with rufous; flanks purer white; under wing-coverts like the back; longest axillaries white with broad black edges, the shorter like the wing-coverts.

Colours of soft parts. Iris pale to blood-orange, the sclerotic membrane blood-red; bill horny-brown, the tip almost black; feet plumbeous-grey.

Measurements. Wing, ♂ 726 to 815 mm., ♀ 755 to 850 mm.; tail 440 to 555 mm.; tarsus 86 to 95 mm.; culmen 74 to 85 mm.; mid-toe and claw 95 to 102 mm.

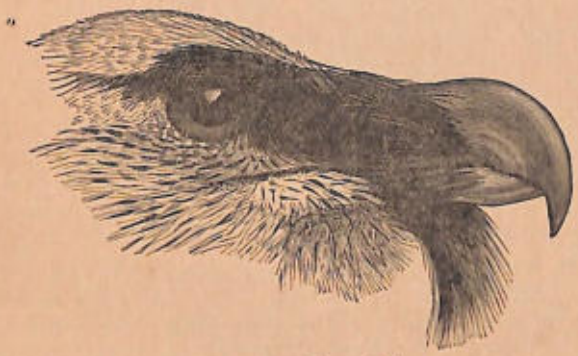


Fig. 7.—Head of *G. b. hemachalanus*.

Young birds have the head and neck black; the upper parts brownish-black and the lower parts greyish-brown with no white shaft-stripes.

Intermediate stages between the young and fully adult plumage are common.

Nestling in down dull, pale, grey-brown sometimes tinged with ferruginous, probably merely a stain from the lower plumage of the adult brooding-bird.

Distribution. Afghanistan, Sind, Baluchistan, the Salt ranges of the Punjab and the whole of the Himalayas as far east as Bhutan.

Nidification. The Himalayan Bearded Vulture breeds throughout its range at elevations of 4,500 feet upwards but up to what elevation it actually nests there is no record. Jones, Dodsworth and Whymper all record 8,000 feet or lower as the limit and it

does not appear to have been found nesting at any great elevations in Kashmir. Meinertzhagen records its breeding at 10,000 feet near Quetta and Williams took eggs on the Marachak also near Quetta at nearly the same elevation. A Bearded Vulture certainly breeds in Ladak at 14,000 feet but this is probably the Central Asian race *altaicus*. It was seen by Osmaston up to 16,500 feet during June in Ladak. The nest is always built on a ledge, or in a cave or crevice on the face of a cliff, often in absolutely inaccessible places, occasionally where they can be taken by hand. Dodsworth, who visited sixteen eyries in the Simla States during January and February of 1912, found that nearly all the nests showed signs of having been occupied for many years and the Hill-men told him that some had been used as long as their village had been in existence. Some were of immense size, composed of sticks and rubbish but nearly always with wool, skins, etc., in the depression as a lining. The number of eggs may be either two or one, never three. In colour they vary from a very pale dull greyish, tinged with ferruginous and sometimes blotched and spotted with various shades of red, to a deep, almost uniform ferruginous-red, the overlying blotches and spots so profuse as to practically cover the whole ground. Occasionally an egg is pale clay or buffy-stone colour, with numerous blotches and spots of lavender. In shape they are broad ovals, pointed eggs being quite exceptional. Sixty eggs average 85·0 × 67·4 mm. as against 82·8 × 65·5 mm., the average of seventy-one European eggs: maxima **91·5** × 70·0 and 87·0 × **72·0** mm.; minima **76·5** × **72·0** mm. The breeding-season lasts from December to February, a few eggs only being laid in March.

Habits. This magnificent bird is a scavenger like the Vultures, living principally on carrion and offal but they have been seen to carry off fowls, wounded game-birds, such as Partridges, Pheasants, etc., and Ward records finding a hare in the stomach of one bird. It has also the curious, though well-known, habit of carrying big bones high into the air and dropping them on rocks so that they may be smashed into small enough bits to swallow. It is credited with killing lambs, fawns and young of the various hill-goats but there is little actual proof that they ever do so. They are not gregarious or even sociable and will not join with Vultures in quarrelling over carcases. When very hungry, however, they will sometimes drive the Vultures away, though, as a rule, they are content to wait and take the bones which these birds leave. The flying power of these birds is very wonderful, especially in the manner in which they soar continuously or glide along the face of some cliff. When thus engaged their heads turn from one side to the other, the wedge-shaped tail moves now and then like a rudder but the wings, stretched, pointed and motionless, seem hardly to alter their position at all, until they suddenly break into a few rapid beats and flap out of sight. Wollaston records that during the Everest Expedition this bird was seen soaring at an elevation of 24,000 feet.

(1717) Gypaëtus barbatus altaicus.

THE ALTAI BEARDED VULTURE.

Gypaëtus altaicus Sharpe, Cat. B.M., i, p. 229, ex Gebler, Bull. Soc. Acad. St. Peters., vi, p. 292 (1840) (Altai).
Gypaëtus barbatus. Blanf. & Oates, iii, p. 328 (part.).

Description. A much larger and much paler bird than the preceding race, the abdomen and vent practically white; the silvery-brown of the upper parts lighter also.

Colours of soft parts as in other races.

Measurements. Wing 830 to 890 mm.

Distribution. Northern Central Asia, Turkestan, Tianschan to Altai and South Siberia, South to Tibet. A pair of birds breeding in the N. Cachar Hills, the wings of one of which measured about 890 mm. (35·5"), must, I think, be attributed to this race; a very pale bird from Nepal, wing 885 mm., must also, I think, be referred to it.

Nidification. Probably not differing in any way from that of the preceding bird except that it breeds at much higher elevations. An egg sent me from Tibet was taken from an eyrie at 14,000 feet and the members of the Everest Expedition saw it soaring at a height certainly of 24,000 feet. Hume records it as resident on the Lingzi Plateau, Yarkand, at over 17,000 feet and Osmaston between 14,000 and 16,000 feet in Ladak. The egg referred to above is a rather poorly-coloured specimen, measuring 85 × 65 mm.

Habits. This race is probably merely a Northern and high altitude race of the Himalayan bird, following the usual law of being paler and larger than its more tropical cousin. Where the two grade one into the other we as yet have no evidence.

Subfamily FALCONINÆ.

This Subfamily differs principally from the *Gypaëtinæ* in its shorter, comparatively deeper bill and in the sharp claws. There is no tuft of bristles on the chin. The arrangement adopted is that of Blanford except that the third of his groups, that which contains the type genus *Falco* with one tooth on each side of the bill, is given priority of place. The key given below applies, in some cases, to Indian species only.

Key to Genera.

A. Bill with one tooth on each side of the upper mandible, opposite the tip of the lower mandible.
a. Tail never more than two-thirds length of wing.

a'. Size moderate, wing never under 180 mm.
a''. Tail rounded, never graduated.
a^3. Sexes alike; foot long, mid-toe over 30 mm. ..... FALCO, p. 31.
b^3. Sexes not alike; foot small, mid-toe about 25·5 mm..... ERYTHROPUS, p. 58.
b''. Tail graduated ..... CERCHNEIS, p. 60.
b'. Size very small, wing under 170 mm. MICROHIERAX, p. 51.
a''. Tail nearly as long as wing ..... NEOHIERAX, p. 55.

B. Bill without any tooth on upper mandible; a festoon commonly present further back.
c. Lores with bristles or with feathers ending in bristles.
c'. Tarsus feathered throughout.
c''. Claws much curved; hind claw longer than inner.
c^3. Primaries exceeding secondaries by more than length of tarsus.
c^4. No crest.
a^5. Nostrils round; bill longer. AQUILA, p. 67.
b^5. Nostrils oval; bill shorter. HIERAËTUS, p. 77.
d^4. A long occipital crest ..... LOPHOTRIORCHIS, p. 80.
d^3. Primaries exceeding secondaries by less than length of tarsus.. SPIZAËTUS, p. 84.
d''. Claws but little curved, inner longer than hind claw ..... ICTINAËTUS, p. 82.
d'. Tarsus not feathered throughout.
e''. Tarsus reticulated throughout, no scutellæ broader than high.
e^3. Tarsus long; more than $1\frac{1}{2}$ times length of bill from point to gape.
e^4. Scales on tarsus subequal throughout.
e^5. Head not crested ..... CIRCAËTUS, p. 93.
d^5. Feathers of head and nape forming a crest ..... SPILORNIS, p. 95.
f^4. Scales in front of tarsus larger than those behind ..... BUTASTUR, p. 103.
f^3. Tarsus short, less than $1\frac{1}{2}$ times length of bill ..... ELANUS, p. 125.
g^4. Size large; tarsi scutellated in front and reticulated or irregularly scutellated behind.
e^5. Claws grooved beneath .. HALIAËTUS, p. 108.
f^5. Claws rounded beneath .. ICHTHYOPHAGA, p. 114.
h^4. Size moderate; tarsus scutellated in front but not behind.
g^5. Tarsus short, less than twice length of bill from gape.
a^6. Tail slightly rounded .. HALIASTUR, p. 118.
b^6. Tail forked ..... MILVUS, p. 120.
h^5. Tarsus long, more than twice length of bill .... CIRCUS, p. 127.

i^4. Size moderate, tarsus scutellated behind.	
i^5. Bill from gape not more than half tarsus.	
c^6. Bill from gape between half and three-quarters length of hind toe without claw	ASTUR, p. 144.
d^6. Bill from gape about half mid-toe..?.....	ACCIPITER, p. 156.
k^5. Bill from gape more than half tarsus	BUTEO, p. 136.
b. Lores densely feathered, without bristles.	
d'. Loral feathers scale-like; bill not much compressed	PERNIS, p. 164.
e'. Loral feathers not scale-like; bill much compressed	MACHÆRAMPHUS, p. 169.
C. Bill with two teeth on either side of the upper mandible, opposite tip of lower bill	BAZA, p. 170.

Genus **FALCO**.

Falco Linn., Syst. Nat., 10th ed. p. 88 (1758).

Type, *Falco subbuteo* Linn.

In this genus the bill is stout and strongly toothed inside the hooked tip, often with a blunt festoon behind the tooth; the nostril is circular with a central tubercle; the tarsus is equal to, or shorter than, the middle toe without the claw; the upper part is plumed in front, whilst the exposed portions are covered by small hexagonal scales; the toes are very long and covered with transverse scales above, the hind toe being shorter in proportion and very powerful; the claws are sharp, curved and strong; the tail is moderate in length and slightly rounded but not graduated; the wing is long and very pointed, the proportions of the primaries varying somewhat; in the Peregrine Falcon the second quill is longest and the first exceeds the third; in the Laggar and the Lanner the first and third quills are about equal, whilst in Sakers the first is the shorter; the second primary is notched on the inner web and in some species this notch extends to the first also.

The Falcons have been much split up by some writers but I follow Sclater in keeping practically all the species under *Falco*, though I separate the Kestrels, which seem sufficiently well differentiated, both structurally as well as in habits, to be conveniently kept apart, whilst *Erythropus* seems to be intermediate between the two. In *Falco* the sexes are sometimes alike and sometimes dissimilar; the young go through one or more phases before reaching the fully adult plumage which, in some cases, takes several years to complete.

Key to Species.

A. Size large; mid-toe without claw over 40 mm.
  a. First primary longer than third; upper parts ashy-grey or slaty-grey in adults.
    a'. Cheek-stripe broad; no nuchal collar. *F. peregrinus*, p. 32.
    b'. Cheek-stripe narrow; a buff nuchal collar ..... *F. peregrinoides*, p. 36.
  b. First primary about equal to third; upper parts not ashy- or slaty-grey.
    c'. A distinct narrow cheek-stripe; middle tail-feathers entirely brown in adults ..... *F. jugger*, p. 37.
    d'. No cheek-stripe; middle tail-feathers with white spots on each web .... *F. cherrug*, p. 39.
B. Size small; mid-toe without claws under 40 mm.
  c. Second quill longest; first much longer than fourth.
    e'. Breast white or buff with brown streaks ..... *F. subbuteo*, p. 41.
    f'. Breast deep rufous, unspotted in adults ..... *F. severus*, p. 45.
  d. Second and third quills subequal; first and fourth quills subequal.
    e'. Crown grey or brown ..... *F. columbarius*, p. 49.
    d'. Crown chestnut..... *F. chiquera*, p. 47.

Falco peregrinus.

Falco peregrinus Tunstall, Orn. Brit., p. 1 (1771).

Type-locality: Great Britain.

The typical form is much bigger and paler than the Indian *P. p. peregrinator* and differs from *P. p. calidus* in being rather darker and in having a good deal more black on the sides of the head and ear-coverts.

Key to Subspecies.

A. Above paler; below white or almost so.. *P. p. calidus*, p. 32.
B. Above much darker; below very ferruginous ..... *P. p. peregrinator*, p. 34.

(1718) Falco peregrinus calidus.

THE EASTERN PEREGRINE FALCON.

Falco calidus Lath., Ind. Orn., i, p. 41 (1709) (India).
Falco peregrinus. Blanf. & Oates, iii, p. 413.

Vernacular names. *Bhyri* ♀, *Bhyri Bacha* ♂ (Hind.); *Bhyri dega* (Tel.); *Dega* (Yerkli).

Description. Head and neck dark slaty, the centres of the feathers blackish; upper back, scapulars and wing-coverts rather paler grey with black shafts and broad bars of dark, dull brown; rump and upper tail-coverts still paler, the brown bands narrower

and showing up more boldly; tail darker again, especially towards the tip, banded with blackish-brown and tipped with white; primaries dark grey, the inner webs barred with mottled rufous and white, these bars becoming more faint on the inner primaries and disappearing on the secondaries, which are narrowly edged with white; cheeks, anterior ear-coverts and a broad line below blackish; lower parts white with more or less of a pinky fulvous tinge on the throat, breast and upper abdomen, and a blue-grey tinge on the lower breast, abdomen, flanks and under tail-coverts; the sides of the neck and the breast are narrowly streaked and the remainder of the underparts narrowly barred with blackish, each bar with a tiny spear-head on the shaft, except in the oldest birds; axillaries and under wing-coverts white barred with dark brown.

Colours of soft parts. Irides brown or deep hazel; bill bluish-slaty, the base of the lower mandible yellowish; cere yellow; legs and feet dull chrome-yellow to almost orange-yellow, claws deep slaty to almost black.

Measurements.—**Male.** Wing 297 to 316 mm.; tail 134 to 145 mm.; tarsus about 49 to 51 mm.; culmen about 25 to 26 mm.; mid-toe and claw about 57 to 58 mm.

Female. Wing 344 to 379 mm.; culmen 27 to 30; mid-toe with claw 62 to 70 mm.

Young birds are dark brown above, darkest on the head and edged everywhere with paler rufescent-brown, the edges broadest and most noticeable on the rump and upper tail-coverts; tail dark brown banded with mottled rufous and brown; whole lower surface pale fulvous-white, the chin and throat immaculate, the rest boldly streaked with brown, the streaks becoming bars on the flanks and thigh-coverts; on the nape the buff bases and edges to the dark brown feathers show through, forming a faint collar.

Every stage of difference may be found between the most juvenile and fully adult birds; the back becomes more slaty-grey at each succeeding moult and the broad streaks on the breast disappear, whilst those on the abdomen, flanks and vent change in character from streaks to bars.

Distribution. Breeding throughout Northern Asia and migrating South in Winter to Malay Peninsula, Burma, India, Eastern Europe and to Egypt and North Africa.

In India it occurs in Winter practically throughout the Empire and has been found as far South as Ceylon, whilst it has also been killed in the Laccadive and Andaman Islands.

Nidification. The Eastern Peregrine Falcon breeds during March and April, placing its nest either in a crevice or on a ledge of some rocky cliff or, where these are not available, on steep river-banks. The eggs, three or four in number, are not distinguishable from those of the Shahin, though almost certainly larger on an

average. 21 eggs measured by Jourdain average 53·2 × 41·2 mm.: maxima **56·6 × 42·5** mm.; minima **48·6 × 41·7** and 50·7 × **39·0** mm.

It is said occasionally to make a nest, very scanty and ill put together, on the ground, or to lay its eggs on the ground with no nest at all.

Habit?. Similar to those of the Common Peregrine but there is very little on record.

(1719) Falco peregrinus peregrinator.

THE SHAHIN FALCON.

Falco peregrinator Sund., Phys. Sall. Tid., i, p. 177 (1837) (Indian Ocean off Nicobar Is.); Blanf. & Oates, iii, p. 415.

Vernacular names. *Shahin Kohi* ♀, *Kohila* ♂, (Hind.); *Jowalum* (Tel.); *Wallur* (Tam.).

Description. Similar to the preceding bird but it is at all ages much darker above and much more ferruginous below; the abdomen, breast and vent vary from deep ferruginous to pale ferruginous-buff but I have seen no specimen either of the true Peregrine or of *F. p. calidus* approaching even the latter in depth of colour; the head and nape is almost black, there is far more black on the sides of the head whilst the cheek-stripe is also much broader.

Colours of soft parts as in the other races.

Measurements.—Male. Wing 265 to 339* mm.; tail 128 to 162 mm.; tarsus 48 to 50 mm.; culmen 25 to 27 mm.; mid-toe with claw about 53 to 55 mm.

Female. Wing 312 to 342 mm.; culmen 28 to 29 mm.; mid-toe about 60 to 63 mm.

Young birds in their first plumage are intensely black on the whole of the upper parts, wings and tail, they then become paler brown and go through the same phases as *Falco p. calidus* but are always age for age darker everywhere and also more ferruginous below.

Distribution. The whole of India and Burma from the sub-Himalayas to Ceylon and to Tounghoo and the Hills of South and Central Burma. It is found in the Yangtse Valley and Southern China, the birds from this country being inseparable from individuals from Assam and from Dharmsala, except that on the whole they are much less ferruginous below and more blue-grey on the abdomen, vent and posterior flanks. Birds from Bonin Island are much smaller and nearer *F. p. pealei* and belong to a small insular form.

Nidification. The Shahin breeds over the Northern portion of its habitat during the end of March, April and early May, second layings sometimes being found in late May and early June. In the South it breeds in suitable localities in January and February. Wherever there are steep cliffs the Shahin may be found

* Probably wrongly sexed, the next biggest male has a wing of 295 mm. only.

breeding from the Himalayas to Travancore, for the nest is invariably placed on a ledge or in a rocky crevice or cave in the face of a cliff or high river-bank. In most cases the nest is a comparatively well-built affair of sticks, sometimes more or less mixed with tufts of grass, weeds, wool or other oddments; sometimes it is lined with wool or with green leaves, sometimes unlined. Not infrequently, however, no nest at all is built, the eggs being deposited on the ground, such having been taken by Jones and Dodsworth near Simla and by Hopwood in Burma. The eggs are exactly like those of the Peregine and go through the same variations. The ground-colour is pale stone-colour, pale yellowish-cream or pale brick-red and the markings consist of blotches of brick-red or reddish-brown, sometimes boldly and rather sparsely distributed so as to contrast finely with the ground-colour, sometimes small and numerous, covering practically the whole surface. Sixty eggs average 51·8 × 40·7 mm.: maxima **58·5** × 42·0 and 56·0 × **44·0** mm.; minima **48·9** × 39·2 and 51·2 × **38·8** mm. Many pairs of birds seem to have alternative eyries, breeding sometimes in one, sometimes in the other.

Habits. The Shahin is not rare along the lower hills of the Himalayas up to some 8,000 or 9,000 feet but over the rest of India it is nowhere at all numerous and in most places very rare. In the hills of South Assam the immense cliffs next the plains are a very favourite resort, and here wherever the cliffs are steep every few miles form the haunt and breeding-home of a single pair, who allow no breeding interlopers of their own kind within it, although they seem to have no objection to the presence of Hobbies and Kestrels. They feed freely on all and any game-birds from quail to the largest pheasants, but their favourite prey seems to consist of pigeons, parrots, bats and, in the Winter, duck and teal. Their stoop is wonderful in its speed and accuracy, all their game being killed by a stroke from the powerful hind claw, which will rip the back of a duck or similar-sized bird from end to end. Large birds when killed are allowed to fall on the land or water and are then retrieved but bats and small birds are seized in the air and carried off. I have seen one of these birds devouring an Eagle-Owl but this may not have been killed by the Shahin, for sometimes this Falcon will partake of a meal from a carcase of a dead animal or will pick up a duck previously shot and lost by some sportsman.

Jerdon describes the method of hawking with this Falcon: "The Shahin is always trained for what, in the language of Falconry, is called a standing quit, that is, is not slipped from the hand at the quarry, but to hover and circle high in the air over the Falconer and party and, when the game is started, it then makes its stoop, which it does with amazing speed. It is indeed a beautiful sight to see this fine bird stoop on a partridge or florikin, which has been flushed at some considerable distance from it, as it often makes a wide circuit round the party. As soon as the Falcon observes the game which has been flushed, it makes

two or three onward plunges in its direction, and then darts down obliquely with half-closed wings on the devoted quarry, with more than the velocity of an arrow. The Shahin is usually trained to stoop at partridge or florikin, occasionally at the stone-plover and jungle-fowl. It will not hover so long in the air as a Laggar, which, being of a more patient and docile disposition, will stay up above an hour."

Falcons for Falconry are either taken from the nest or, preferably, caught in many ways after they have left it. A very common way is with a fall-net beside a bird pegged to the ground as a lure. Another way described by Jerdon is by affixing a lime-covered piece of cane to a bird which is made to soar; the Falcon strikes the bird, becomes entangled with the cane and falls to the ground.

They are said to be long-lived birds and certain eyries to have been occupied by, presumably, the same pair of birds for about forty years. Certain stretches of country seem to be favoured by these birds above others and if one pair is killed another promptly takes its place. In the same way if one of a pair dies the remaining bird mates again at once, and thus an eyrie may be occupied almost indefinitely.

Falco peregrinoides.

Falco peregrinoides Temm., Pl. Col., livr. lxxxi, pl. 479 (1829).

Type-locality: Nubia.

The typical African form is much smaller than that found in India.

(1720) Falco peregrinoides babylonicus.

THE RED-CAPPED FALCON.

Falco babylonicus Gurney, Ibis, 1861, p. 218 (Oudh).
Falco barbarus. Blanf. & Oates, iii, p. 417.

Vernacular names. *Shahin, Safed Shahin* (Hind.); *Lal-sir Shahin* (Hind., Punjab).

Description. Lores and forehead pale rufous, the latter shading into ashy-brown on the hind crown and nape, each feather with a blackish shaft-line; a broad nuchal collar rufous, more or less mottled with brown, especially in the centre; upper parts ashy-grey barred with dark brown, this colour dominating the upper back and lesser wing-coverts but gradually becoming fainter and more narrow posteriorly, the longest upper tail-coverts being almost pure pale grey in very old birds; tail ashy-grey tipped with pale rufous and barred with dark brown, the bars darkest and broadest at the tip, palest at the base; primaries dark brown barred with pale rufous on the inner webs when concealed; secondaries like the scapulars and wing-coverts; feathers round the eye, cheeks, a few streaks on the ear-coverts and a broad moustachial streak black; chin and throat white to pale rufous deepening gradually towards the vent; lower breast to under tail-

coverts narrowly barred with blackish bars obsoletely edged with grey: in old birds the bars on the centre of the breast and abdomen almost disappear and even those on the flanks are greatly reduced.

Colours of soft parts. Iris deep brown; bill slaty-blue, the tip almost black, base sometimes yellowish; cere, orbital skin and gape bright yellow; legs and feet bright yellow to deep yellow, claws black.

Measurements. ♂, wing 273 to 284 mm.; tail 126 to 135 mm.; tarsus 45 to 46 mm.; culmen 23 to 26 mm.; ♀, wing 320 to 338 mm.; tail 151 to 158 mm.; tarsus 53 to 55 mm.; culmen 26 to 28 mm.

Young birds have the upper parts and wings dark brown, each feather broadly edged with pale rufous and those of the scapulars and greater coverts with rufous spots or broken bars on either web; upper tail-coverts and tail barred rufous and brown; a broad rufous nuchal collar much mixed with brown; black on face as in the adult; lower parts pale to deep rufous with broad streaks of dark brown on all but the chin and throat.

Distribution. West and Central Asia through Mesopotamia and Persia to Afghanistan and Baluchistan. Common in India in the North-West as far East as the United Provinces and Nepal, though Hodgson's specimens from the latter country may have been tame. South it has occurred as far as Raipur. Col. A. C. Butler says that he shot one bird at Mt. Aboo, as well as many in Sind.

Nidification. Lieut. (now Col.) Phillott took two young from an eyrie in the Gumal Pass, at about 2,000 feet, near Dehra Ismail Khan; Delmé Radcliffe informed Hume that they bred in some numbers in the hills surrounding Kalabagh and many in and about the Khyber Pass and in Afghanistan. Beyond this I can find nothing authentic about their breeding within our limits.

Habits. Very similar to those of the Shahin but whereas that bird prefers well-wooded, well-watered country, this Falcon is essentially one of barren rocky hills and desert country. It is a bold, powerful bird and is used in Falconry for the pursuit of partridges, florikin and especially wild duck. Their cry is said to be the same loud scream as that of the Peregrine Falcon.

(1721) Falco jugger.

THE LAGGAR FALCON.

Falco jugger Gray in Hardw. Ill. Ind. Zool., ii, pl. 26 (1833–4) (India); Blanf. & Oates, iii, p. 419.

Vernacular names. *Laggar* ♀, *Jaggar* ♂ (Hind.); *Lagadu* (Tel.).

Description. Forehead, lores and broad supercilia to the nape white to pale rufous, with more or less black shaft-streaks; crown and nape rufous with broad central black streaks; hind neck and upper back dark brown, becoming paler and more ashy in tint

towards the tail; each feather with pale ashy edges and with black shafts, not noticeable on the darker parts but contrasting strongly on the pale upper tail-coverts; pale ashy-brown tipped with white or fulvous, the central tail-feathers immaculate or obsoletely barred with paler rufous and the lateral more boldly barred on the inner webs; wing-coverts like the back but paler; primaries dark brown, edged pale and boldly barred on the concealed inner webs, the bars gradually becoming less on the secondaries and almost disappearing on the innermost; a narrow rim of feathers round the eye and a broad streak from behind the eye to the neck black; a few black streaks on the cheeks and a narrow moustachial streak also black; remainder of sides of head, chin, throat and under plumage white to pale fulvous or rufescent-white; sides of lower breast and abdomen much barred with deep brown, the bars changing to lanceolate drops and then to fine streaks on the centre of the breast and abdomen.



Fig. 8.—Head of *F. jugger*. ¾.

Colours of soft parts. Iris dark brown; bill bluish-slaty, darker at the tip, paler and sometimes yellowish at the base; cere yellow; legs and feet yellow, claws black.

Measurements. Wing, ♂ 305 to 328 mm., ♀ 323 to 364 mm.; tail, ♂ 167 to 175 mm., ♀ 169 to 198 mm.; tarsus about 47 to 50 mm.; culmen 24 to 26 mm.

Young birds are dark brown above, the feathers pale edged, the crown often with very conspicuous pale edges; chin and throat white or fulvous-white and practically the whole of the rest of the lower parts dark brown, the pale bases showing through here and there, especially on the abdomen and lower tail-coverts.

In the young the cere is pale grey-green and the legs and feet are dull slaty or greenish-grey.

Distribution. Practically the whole of India from the extreme South to the Himalayas and from Afghanistan, Baluchistan and Sind on the West to Manipur and Assam in the East. I twice obtained it in Cachar but neither I, Coltart nor Stevens ever met with it in Upper Assam.

Nidification. The Laggar Falcon breeds over the whole of its area in January, February and March, but occasional second layings may be taken in April and Vidal took one such in Sind on the 15th May. Occasionally they build their own nests but, as a rule, use old nests of Vultures, Kites and even Crows, not troubling

even to repair them so long as they will hold their eggs in safety. The nest, built or stolen, may be placed on tree, cliff or building and in Sind Scrope Doig took over a dozen nests all placed on tombs in bare plains, the one exception being built in a tree. The eggs number three or four, rarely as many as five or as few as two. They are typical Falcons' eggs but are much paler than those of the Peregrine a great many having a very pink tinge. As a series they are not nearly so densely marked as are those of the true Peregrines, the spots, blotches and smudges being much more definite, and many of the eggs being of great beauty. Fifty eggs average 50·0 × 39·4 mm.: maxima **54·7** × 39·3 and 51·0 × **41·0** mm.; minima **46·5** × 39·4 and 49·0 × **36·2** mm. In shape they are broad ovals and the texture is coarse but close without any gloss. Both birds sit very close once the full complement of eggs is laid and will often attack anyone robbing them.

Habits. This Falcon is a bird of open and cultivated country and, to some extent, of light deciduous woods but never of the damp, humid evergreen forests of the wetter districts. It has no fear of civilization and haunts the surroundings and even the interior of towns and villages, not infrequently preying on chickens and tame pigeons. A curious fact that has often been commented upon, not only in regard to this, but to other Raptores also, is that the very birds on which they prey to the greatest extent build their nests close to those of the Falcons, who never interfere with them. Evidently some natural law is obeyed which grants immunity under such circumstances, for we find that it is almost universal. The Laggar eats more pigeons, doves and rollers than any other species of bird, yet Blue Pigeons often breed in a cliff where there is a nest of the Falcon, doves build in the same tree and rollers have nests in the very building selected by the Falcon for the same purpose. The Laggar is now seldom trained for hawking but in former times was much used for the pursuit of crows and to a less extent for herons of all kinds and for most game-birds. Its flight and boldness are ranked as less admirable than those of the Shahin but it is considered more docile, more patient and easier to teach. Ticehurst speaks of it as "a degenerate Falcon" in Sind and observes that it there preys principally on "lizards, gerbilles, locusts, etc."

Falco cherrug.

Key to Subspecies.

A. Plumage above with no bars ..... *F. c. cherrug*, p. 39.
B. Plumage above barred throughout ..... *F. c. milvipes*, p. 41.

(1722) Falco cherrug cherrug.

THE SAKER OR CHERRUG FALCON.

Falco cherrug Gray in Hardw. Ill. Ind. Zool., ii, pl. 26 (1833–4) (India); Blanf. & Oates, iii, p. 420.

Vernacular names. *Charg* ♀, *Chargela* ♂ (Hind.).

Description. Forehead, crown and nape white or fulvous-white, each feather with a broad central dark brown streak; bristly shafts of lores and cheeks black; posterior ear-coverts more or less streaked with brown; a very narrow moustachial-streak brown; remainder of head and face white or fulvous-white; nape white heavily spotted with short brown streaks; remainder of upper parts and wing-coverts brown with broad tawny edges and blackish shafts; the greater coverts, scapulars and sometimes a few other feathers with one or two fulvous or rufous spots or broken bars; quills rather darker brown barred on the concealed portions of the inner webs with white or rufescent-white, the white coalescing on the edges; tail pale fulvous-brown, the central feathers spotted on both webs with white, each spot edged darker; the lateral feathers darker and barred, not spotted; lower parts white or nearly so, with longitudinal drops of light brown, small and sometimes almost disappearing on the breast and centre of the abdomen in very old birds, larger and more numerous on the flanks and thigh-coverts and absent on the under tail-coverts; axillaries and under wing-coverts white more or less streaked with brown.

Colours of soft parts. Iris dark brown to golden-hazel in old birds; bill ivory-white or yellowish-white tipped blackish; cere dull yellow; legs and feet dull yellow or yellowish-green, claws black.

Measurements. Wing, ♂ 348 to 370 mm., ♀ 390 to 412 mm.; tail, ♂ 190 to 200 mm., ♀ 207 to 210 mm.; tarsus about 56 to 58 mm.; culmen about 26 to 27 mm.

Young birds are darker and more brown generally above, the head is more brown and the dark markings on the head more extensive; below the chin and throat only are immaculate, bold dark brown streaks covering the remaining parts; in some young birds the central tail-feathers are without bars or spots. The cere is dull grey-green and the iris dull brown.

Distribution. Breeding in the Balkan Peninsula, South Russia, Cyprus and West Central Asia, migrating to North-West India, China and North-West Africa in Winter.

In India it is common in the North-West Provinces and the Punjab, straggling into Sind and as far East as Nepal, though Hodgson's specimens may have been tame birds.

Nidification. The Saker breeds during April and early May, generally constructing its own nest in trees, less often on cliffs or high river-banks and occasionally usurping the nest of a Vulture or some other large bird. When self-made the nest is said to be compact, bulky and well-lined and almost invariably at a great height from the ground. The full complement of eggs is three or four, most often the latter. In general appearance they are much like those of the Peregrines but, on the whole, a browner, less rich red and not so handsome. They are in fact somewhat intermediate between the Peregrine's and the Laggar Falcon's but are nearer the former. One hundred and fifty eggs

average 54·1 × 41·6 mm.: maxima **58·7 × 43·6** mm., minima **50·1** × 40·5 and 52·2 × **38·8** mm.

Habits. This is a Falcon of open lands, deserts and wide uncultivated tracts. It is inferior only to the Peregrine in courage and speed and formerly used to be trained to kill hares and gazelles, as well as Cranes, Bustard and Kites. It feeds on all kinds of birds and small mammals but in the Punjab is said to feed principally on a lizard (*Uromastix hardwickii*) found only in dry and barren country.

(1723) Falco cherrug milvipes.

THE SHANGHAR FALCON.

Falco milvipes Hodgs. in Gray's Misc., p. 81 (1844) (Nepal); Blanf. & Oates, iii, p. 421.

Vernacular names not distinguished from the preceding bird.

Description. Differs from *F. c. cherrug* in having the whole of the upper parts a darker brown barred everywhere with pale dull rufous; the central tail-feathers are barred, not spotted, and the primaries are marked with rufous on the outer webs; the moustachial streak is broader and blacker and the sides of the head more streaked with black; the crown is darker and more rufous and the underparts marked with darker brown.

Colours of soft parts as in *F. c. cherrug* but with a darker bill, more bluish-slate than ivory-white.

Measurements. Wing, ♂ 340 to 351 mm., ♀ 374 to 435 mm.; tail 188 to 236 mm.; tarsus 50 to 60 mm.; culmen 25 to 27 mm.

Young birds are very similar to that of the preceding bird but are darker and generally have the tail with complete cross-bars.

Distribution. Central Asia East of the range of the preceding race, Turkestan, Tibet, Mongolia and Setchuan. In Winter to Baluchistan, India and South China.

Nidification. As far as is known this Falcon breeds in the mountains of Central Asia in April, making its own nest on ledges or in crevices of cliffs. The normal full clutch seems to be three, less often four. The eggs are like those of Peregrines and nineteen average 55·6 × 42·3 mm.: maxima **57·6** × 41·2 and 57·0 × **44·0** mm.; minima **53·6** × 43·0 and 57·5 × **41·0** mm.

Habits. Apparently similar to those of the preceding bird but it is more exclusively a bird of mountainous country. The earlier records of the two birds have been much confused so that it is not easy to say what refers to which.

Falco subbuteo.

The Hobby has been much split up by various authorities and the latest, Kirke-Swann, recognizes four Asiatic and European races, *F. s. subbuteo*, Europe and in Winter to India; *centralasiæ*,

from Central Asia, *jarkutensis* (=*saturatus*) from E. Asia and *streichi*, a small form breeding in South China. Its small size suffices to distinguish *streichi* from the other three but these latter are very hard to distinguish from one another. With large series it, however, seems possible to pick out from birds killed in the breeding-season, first, birds from Central Asia averaging larger and paler than European specimens and, secondly, a few Eastern (presumably) breeding-birds which are somewhat darker and which average in measurement between these two. For the present, therefore, I accept the four races, all of which are found within our limits.

Key to Subspecies.

A. Larger; wing over, ♂ 240 mm.; ♀ 270 mm.	
a. Darker	*F. s. jarkutensis*, p. 44.
b. Intermediate, but nearer *F. s. jarkutensis*.	*F. s. subbuteo*, p. 42.
c. Paler	*F. s. centralasiæ*, p. 43.
B. Smaller; wing, under, ♂ 240 mm., ♀ 270 mm.	*F. s. streichi*, p. 44.

(1724) Falco subbuteo subbuteo.

THE HOBBY.

Falco subbuteo Linn., Syst. Nat., 10th ed. i, p. 89 (1758) (Sweden); Blanf. & Oates, iii, p. 422 (part.).

Vernacular names. *Morassani* (Oude).

Description. Upper parts slaty-grey, darkest on the head and upper back, palest on the lower back, rump and upper tail-coverts, the feathers of these parts black-shafted; outer tail-feathers barred on the inner webs with darker slate and dull rufous-grey; a collar on the hind-neck white, sometimes tinged with rufous; primaries and outer secondaries almost black with a fine edging of whitish; inner webs with half-bars of dull rufous; round the eye, cheeks, ear-coverts and a broad moustachial stripe blackish-slate; forehead, lores and a small supercilium whitish; chin, throat, front and sides of neck pure white; thighs and under tail-coverts rufous; remainder of lower parts white, more or less tinged with rufous, especially on the lower abdomen and flanks, and broadly streaked throughout with black.

Colours of soft parts. Iris bright hazel to deep brown; bill pale slate with black tip and sometimes a yellowish tinge at the base of the lower mandible; cere and orbital skin greenish-yellow; legs orange, claws black.

Measurements. Wing, ♂ 245 to 265 mm., ♀ 273 to 280 mm.; tail, ♂ 129 to 142 mm., ♀ 146 to 148 mm.; tarsus about 30 to 35 mm.; culmen 17 to 18 mm.

Young birds are much darker above, almost black and generally with a brown rather than a slaty tinge; each feather is broadly edged with white, fulvous-white or pale rufous; the bars on the

lateral tail-feathers extend to the outer webs; the underparts are white or fulvous-white, nearly always tinged with rufous and sometimes all pale rufous broadly streaked with blackish.

Distribution. Europe and Asia, East to Japan; South in Winter to Africa, India and China.

Hobbies in poor condition are often very difficult to determine but undoubtedly a very large number of our Indian cold weather birds cannot be distinguished from the European typical race.

Nidification. The Hobby breeds during June, generally in the first half of that month, depositing its eggs in old nests of Crows, Magpies or Herons, occasionally in a Rook's nest or in a squirrel's drey. The tree selected is most often one in a hedge or on the extreme edge of a spinney, whence the bird can observe intruders from a considerable distance. The number of eggs laid is nearly always three, sometimes only two, whilst on the continent four are not very rare. The ground-colour is a pale dull yellowish or pinkish-clay, the whole surface profusely speckled all over with reddish-brown, almost obliterating the ground-colour. Rarely the eggs are more boldly marked with larger blotches and are then very like Kestrels' eggs, from which, indeed, it is impossible to distinguish them with certainty. Fifty eggs average 41·5×32·7 mm.: maxima **45·5×31·8** and 44·1×**35·7** mm.; minima **38·1×31·1** and 38·8×**31·0** mm. Incubation is said to take 28 days and both parents share in this duty, though the female does the greater part.

Habits. The Hobby is a bird of well-wooded country living principally on small birds, bats and the larger insects. Its flight is very powerful and swift and in character very like that of the Peregrine. It has been recorded as catching Swifts on the wing on several occasions and it frequently captures dragonflies and the quickest flying butterflies, etc. It is a very bold courageous bird and in former time was much used for hawking thrushes, larks, pipits and other small birds. When not busy feeding their young they are rather crepuscular in their habits, hawking principally in the mornings and evenings.

(1725) Falco subbuteo centralasiæ.

THE CENTRAL ASIAN HOBBY.

Falco subbuteo centralasiæ Buturlin, Orn. Mitt., ii, p. 175 (1911, Tianschan).
Falco subbuteo. Blanf. & Oates, iii, p. 422 (part.).

Vernacular Names. *Morassani* (Oude).

Description. Similar to the preceding race but paler and, on an average, rather larger.

Colours of soft parts as in the typical race.

Measurements. Wing, ♂ 250 to 275 mm., ♀ 277 to 286 mm.

Distribution.—Central Asia, South to the Himalayas. Kirke-Swann refers to this race a specimen from Assam. Buchanan, Rattray and Osmaston obtained it breeding in Murree and Kashmir and Jones took nests in and near Simla.

Nidification. This Hobby breeds in the Himalayas from 6,000 feet, at which height Jones obtained young birds near Simla, to 14,000 feet in Tibet. It lays three or four eggs, quite indistinguishable from those of the British bird. The twenty I have seen and measured average 41·4 × 33·0 mm.: maxima **43·4** × 31·9 and 40·8 × **34·2** mm.; minima **39·3** × 31·7 and 40·0 × **31·4** mm. Nests with eggs have been taken from the 29th May to the 7th July, whilst Jones found well-fledged young on the 16th August. This race, like the others, makes use of the old nests of other birds for breeding-purposes, but seems to select trees well inside heavy forest as well as those on the outskirts.

Habits. Except that it is more essentially a frequenter of the interior of forests rather than of their outskirts the habits of this Hobby are typical of the species. The young birds found by Jones eventually died, or were killed by their parents and partly eaten.

(1726) Falco subbuteo jarkutensis.

THE KAMSCHATKAN HOBBY.

Falco jarkutensis Buturlin, Nascha Ochota, iv, p. 71 (1910) (N.E. Siberia).
Falco subbuteo. Blanf. & Oates, iii, p. 422 (part.).

Vernacular names. None recorded.

Distribution. This Hobby differs from the typical form in being slightly darker and slightly larger.

Colours of soft parts as in the other races.

Measurements as in the Central Asian race.

Distribution. Eastern Siberia and Central Asia to Kamtschatka and in Winter South to Japan and China. Meinertzhagen obtained specimens of this race in Ladak and the Winter birds obtained by me in Assam were also referable to it.

Nidification. Not recorded.

Habits. Those of the species.

(1727) Falco subbuteo streichi.

THE CHINESE HOBBY.

Falco subbuteo streichi Hartert & Neum., Journ. für Orn., 1907, p. 572 (Swatow, South China).
Falco subbuteo. Blanf. & Oates, iii, p. 422 (part.).

Vernacular names. None recorded.

Description. Differs from the European Hobby only in its smaller size.

Colours of soft parts as in the preceding race.

Measurements. Wing, ♂ 235 to 258 mm., ♀ 245 to 268 mm.; tail 121 to 133 mm.; tarsus 30 to 32 mm.; culmen 15 to 17 mm.; mid-toe and claw 35 to 36 mm.

Distribution. Breeding in South China and as far West as the Shan States. Harington found a Hobby, not *severus*, breeding in the Ruby Mines District which was evidently the present race, both Cook and Livesey have also recorded the occurrence of a Hobby in the same district, whilst there is one specimen, unsexed, of this race in the British Museum from these States. Forrest obtained it in Yunnan.

Nidification. La Touche and Rickett found this Hobby breeding freely in Fokhien from May to July, whilst Vaughan and Jones obtained eggs near Howlik in June and July. The eggs are laid in old nests of Kites, Magpies, Crows or Mynas, and number from two to four, three being the most usual number. One set of eggs taken by Jones was laid in an old nest on the top of a pagoda but the site normally selected is one on a tree standing either by itself or in a small clump or orchard. Fifteen eggs taken by La Touche and five others taken by Jones average 40·1 × 31·7 mm.: maxima **43·1** × 32·5 and 40·6 × **34·0** mm.; minima **38·1** × 29·7 and 38·5 × **29·5** mm.

Habits. This Hobby is said to collect in flocks of some size prior to local migration in September and October. According to Vaughan and Jones it is a resident bird inland but only visits the coast as a casual visitor in Winter. It feeds largely on insects but also on small birds and mammals. It is a very bold bird and seems to have a special antipathy to Kites, which it attacks viciously whatever the season of the year, making its loud screaming cry at the same time.

Falco severus.

Key to Subspecies.

A. Darker, lower plumage very deep ferruginous ..... *F. s. severus*, p. 45.
B. Paler, lower plumage less deep ferruginous *F. s. rufipedoides*, p. 47.

(1728) Falco severus severus.

THE BURMESE HOBBY.

Falco severus Horsf., Trans. Linn. Soc., xiii, p. 135 (1822) (Java); Blanf. & Oates, iii, p. 423 (part.).

Vernacular names. None recorded.

Description. Head, hind-neck and upper back almost black, just tinged with slaty, changing gradually into dark slaty-grey on the lower back, scapulars, wing-coverts, rump, upper tail-coverts and tail, each feather with a black shaft; central tail-feathers faintly barred darker, very old birds having only one subterminal

blackish band; lateral tail-feathers more boldly barred; primaries black, the inner concealed webs with short bars or spots of pale ashy-rufous; outer secondaries with fainter spots and inner secondaries grey like the scapulars; sides of the neck, chin and throat white tinged with orange-rufous; remainder of lower parts deep ferruginous-red, often showing traces of black streaks on the sides of the breast.

Colours of soft parts. Iris hazel-brown to almost black; bill bluish-slate, the tip black and the base paler; cere, gape and orbital skin lemon-yellow; legs and feet yellow to almost orange-yellow, claws black.

Measurements. Wing 221 to 238 mm.; tail 95 to 110 mm.; tarsus about 30 to 33 mm.; culmen about 18 mm. (Apparently all females.)

Young birds are very dark above, the feathers when first moulted with narrow rufous edges, soon lost by abrasion; the under surface is boldly streaked with black from upper breast to under tail-coverts.

Distribution. Assam, Cachar, Manipur, Arakan, Kachin Hills, Tenasserim, Siam (Malay States?) to the Philippines. East to Trang Bong in Cochin China.

Nidification. The Burmese Hobby breeds in some numbers in the Cachar and Khasia Hills, almost invariably selecting an old nest of a Crow or other bird built in a tree on the face of a very steep cliff. Rarely the nest is placed on a ledge of rock and when this is the case it is very roughly and carelessly built, probably by the birds themselves, whilst in one case in Burma P. Macdonald found a solitary young bird in a hole in the high earth-bank of the Mugitha River. In the Khasia Hills each pair of birds seemed to have two nests, which they used in alternate years or to which they resorted if the first set of eggs were taken. The eggs are like those of the other races but much more richly coloured than those of the European Hobby. Fifty-four eggs average 40·1 × 31·9 mm.: maxima **41·4** × 33·0 and 41·1 × **34·0** mm.; minima **37·1** × 30·9 and 38·4 × **30·0** mm. The breeding-season lasts from April to June and I think some birds rear two broods in the season.

Habits. Like all other Hobbies these are birds of well-wooded country, but they never appear to penetrate deep woods and prefer scattered copses or single trees. They feed on insects, the larger Coleoptera, small birds and bats, some individuals confining themselves almost entirely to the last-named. These they catch by a steady pursuit and not by the wild dash and stoop by which small birds are captured. All those I saw taken were grabbed in the air and then carried off to a tree to be eaten. Every pair of Hobbies have their own hunting-ground, which they guard most jealously from others of their own species yet share in amity with Peregrines and other larger Raptores. I have seen remains of Barbets, Bulbuls, Bustard-Quail and other birds, lizards, mice, rats, etc., in or under their nests. Their cry is a loud squealing note and when enraged they repeat this cry continuously until

the intruder retires. Like all Hobbies they are very crepuscular in their habits and very seldom hunt during the hotter hours of the day, even when the young are hatched.

(1729) Falco severus rufipedoides*.

THE INDIAN HOBBY.

Falco rufipedoides Hodgs., Calcutta Journ. Nat. Hist., iv, p. 284 (1844) (Nepal).
Falco severus. Blanf. & Oates, iii, p. 423 (part.).

Vernacular names. *Dhutar* ♂, *Dhuti* ♀ (Hind.).

Description. Differs from the preceding bird in having the lower plumage much lighter; the upper plumage is practically the same as in *F. s. severus*.

Colours of soft parts as in the other races.

Measurements. Wing, ♂ 211 to 219 mm., ♀ 237 to 248 mm.; tail, ♂ 94 to 95 mm., ♀ 105 to 112 mm.; tarsus 33 to 34 mm.; culmen, ♂ 17 mm., ♀ 19 mm.

Distribution. The Himalayas from Kuman to Western Assam, North of the Brahmapootra. There are also Winter specimens in the British Museum from Oude, Calcutta, Punjab and Travancore.

Nidification. Donald says that this Hobby is a regular breeder in Garhwal. Mackinnon took one nest near Murree and others round about Mussoorie. The eggs are deposited in the nests of other birds, repaired and lined afresh by the Hobbies themselves, built on trees on the outskirts of heavy forest. The only three eggs in my collection were taken on the 14th June and measure 41·4 × 30·2, 40·2 × 29·0 and 40·8 × 31·0 mm. respectively.

Habits. Those of the species.

(1730) Falco chiquera chiquera.

THE RED-HEADED MERLIN.

Falco chiquera Dauden, Traité, ii, p. 121 (1800) (Bengal); Blanf. & Oates, iii, p. 427.

Vernacular names. *Turumti*, *Turumtari* ♀ (Hind.); *Chetwa* (Hindi); *Jellaganta*, *Jelgadda* (Tel.); *Jelkat* (Yerkli).

Description. Crown, nape, sides of neck, posterior ear-coverts and a cheek-stripe chestnut; lores and sides of the forehead whitish; upper parts clear pale bluish-ashy, the wing-coverts and scapulars with narrow bars of black; tail the same with a very broad sub-apical black band, the extreme tip almost white;

* Messrs. Meyer and Wiglesworth, in naming our Indian race *indicus*, overlooked the fact that Hodgson had already published (in *loc. cit.*) a good description of this form, giving it the name quoted.

primaries dark brown edged with pale grey and the inner tipped and edged also on the inner webs, which are all closely barred with grey turning white as the feathers bleach; edge of wing generally mottled with rufous and white all round the shoulder; anterior ear-coverts and lower plumage white, the breast with a few black central streaks and the remainder of the lower parts clearly barred with blackish.

Colours of soft parts. Iris light brown; bill dark plumbeous, black at the tip, greenish-yellow on the basal half; cere, orbital skin and legs yellow, claws black.

Measurements. Wing, ♂ 190 to 201 mm., ♀ 220 to 232 mm.; tail, ♂ 124 to 131 mm., ♀ 152 to 155 mm.; tarsus, ♂ 35 to 37 mm., ♀ 38 to 39 mm.; culmen, ♂ 17 to 19 mm., ♀ 20 to 21 mm.

Young birds are more heavily barred than adults and quite young birds have the upper parts also barred throughout, whilst the chestnut of the head is duller, more rufous and is streaked with black; the throat and breast are also heavily marked with black.

Distribution. Himalayas to extreme South India. East it occurs in the Surrma Valley, where it is rare, and Hume saw it in Manipur. We never saw it anywhere in Assam in the Brahmapootra Valley.

Nidification. The Turumties, or Red-headed Merlins, breed during January, February and March, a few birds laying as late as May, though these are probably second layings. As a rule they build new nests every year but some birds repair their old nests and a few appropriate the nests of other birds, such as those of Crows and Kites. The nests are well built of small sticks and twigs and lined with grass and roots, the roots of the khas khas grass being a favourite material for this purpose. Where big trees are available they are placed high up and well hidden in these, but in the more arid districts, where large trees are not to be found, they are often placed quite low down in small babool or other trees. Three or four eggs are laid, which closely resemble those of the Hobby but are more red, less brown in general tint. Very washed-out pale eggs are not at all uncommon. One hundred eggs average 41·7 × 32·1 mm.: maxima **46·7** × 31·0 and 41·4 × **34·0** mm.; minima **40·2** × 32·0 and 41·3 × **30·0** mm. The parent-birds guard their nesting-area with great jealousy, and will attack even Kites and the larger Falcons if they approach too near.

Habits. The Turumti is a bird of the open country and is never found in forest but, on the other hand, is quite common in many almost desert districts. Its flight is intermediate between that of the true Falcons and the Kestrels and it sometimes hovers in the air as the latter do. It was formerly employed in Falconry for the pursuit of small birds, more especially the Roller or "Blue Jay," and differs from the true Falcons in following its quarry into trees

and driving it therefrom. It is occasionally trained to work in couples. In a wild state it regularly hunts hedges, banks and the edges of groves and orchards, seizing on any small bird or mammal it may espy. Jerdon says that it also feeds on bats in the dark. Its cry is a high-pitched squeal like that of the Merlin and it has also a chattering screech when angry similar to the anger-note of that bird.

Falco columbarius *.

Falco columbarius Linn., Syst. Nat., 10th ed. p. 90 (1758).

Type-locality: America.

The typical form, as also *F. c. regulus*, the British form, is much darker than either of the two forms found within our limits.

Key to Subspecies.

A. Darker, both above and below in both sexes ..... *F. c. insignis*, p. 49.
B. Paler ..... *F. c. christiani-ludovici*, p. 50.

(1731) Falco columbarius insignis.

THE NORTH ASIAN MERLIN.

Æsalon regulus insignis Clarke, Proc. U.S. Nat. Mus. xvi, p. 470 (1907) (Corea).
Æsalon regulus. Blanf. & Oates, iii, p. 426.

Vernacular names. *Daurai* ♀, *Daurela* ♂ (Hin.); *Retal Turumti, Regi* (Panjab).

Description. Forehead, lores, small supercilium and sides of the head whitish with black shaft-streaks, the supercilium becoming rufescent posteriorly; upper parts bluish-slaty, each feather with a black shaft-stripe; feathers of the hind-neck rufous with black stripes, forming a broad distinct collar; tail tipped white and with a broad black sub-terminal band; quills brownish-black, the first edged white, the others sub-edged grey and all barred with white, becoming grey on the inner primaries and secondaries; innermost secondaries like the back; chin and throat immaculate white; sides of throat, neck and all underparts white, more or less strongly tinged with rufous and streaked with black; in many specimens the thigh-coverts and under tail-coverts are a darker rufous than elsewhere.

Colours of soft parts. Iris brown; bill slaty-blue, tipped black and yellowish at the base of the lower mandible; cere, legs and feet yellow, claws black.

* Many systematists still retain the Merlins in a separate genus, *Æsalon*.

Measurements. Wing, ♂ 196 to 204 mm., ♀ 220 to 224 mm.; tail 121 to 138 mm.; tarsus about 34 to 39 mm.; culmen, ♂ 14 to 15 mm., ♀ 15 to 16 mm.

Female. In very old females like males but these are exceptional. As a rule, the head is rufous-brown with dark shafts; hind-neck as in the male but whiter and with broader shafts; upper parts brown with a tinge of slate-grey, each feather margined with rufous and dark-shafted; scapulars and wing-coverts with broader edges and stripes: tail barred dark brown and rufous-grey throughout, tip whitish and apical dark brown bar broader than the rest; underparts paler than in the male and more broadly streaked with brown, especially on the breast and flanks.

Young birds are browner than the adult female without the grey or slate tinge; the margins to the feathers are more pronounced and the head is rather more rufous. The bars on the wing-quills extend across both webs.

Distribution. Breeding Northern Asia from Turkestan to Ussuri and Japan and migrating in Winter to Cyprus, Egypt, Mesopotamia, Syria, India and South China.

In India it has been obtained in Kandahar, the Peshin Valley, Gilgit and in various places in the Punjab and in Sind.

Nidification. A clutch of eggs in my collection was taken on the 2nd June at Fort Naryn, Turkestan, from a nest on the ground. They are very handsome eggs of the same type as those of the Turumti but are darker, deeper red and more handsomely blotched. They measure 39·7 × 31·0, 40·5 × 30·3 and 41·2 × 32·0 mm.

Habits. Nothing on record but probably differing in no way from those of the European bird.

(1732) Falco columbarius christiani-ludovici.

THE CENTRAL ASIAN MERLIN.

Falco columbarius christiani-ludovici Kleinsch., Falco, xiii, p. 10 (1917) (Caucasus).
Falco regulus. Blanf. & Oates, iii, p. 426 (part.).

Vernacular names. As in the preceding bird.

Description. Differs from all other races in being much paler in both sexes; female and young are pale rufous in general effect rather than rufous-brown; the bars on the primaries in both sexes are especially pale.

Colours of soft parts as in the preceding bird but the bill a paler bluish and the cere a paler yellow.

Measurements. Wing, ♂ 203 to 226 mm., ♀ 200 to 232 mm.

Distribution. "Breeding from the Kirghis Steppes to the confines of Altai" (*Sushkin*). There are specimens in the British Museum from Mesopotamia, Trebizond, Arabia, Peshawar, Kohat,

Gilgit and Sind. From further East there is a specimen from Gyantse, Tibet, and Ludlow obtained another from the same place.

Nidification. The eggs of this race have been taken in May and June and number three to five according to Evermann, or two to six according to Sarudny. They differ in no way from those of the other races.

Habits. Those of the species. It is said to prey principally on small birds, less often on insects.

Genus **MICROHIERAX.**

Microhierax Sharpe, Cat. B.M., i, p. 366 (1874).

Type, *Falco fringillarius* Drap.

The genus *Microhierax* contains five species of pigmy Falcons, or Falconets, tiny Raptores with the carriage and wonderful eye of the fiercest Eagle, and habits which, almost alone, would justify their separation from the other Accipitres.

The bill is large, slightly compressed, with a very large tooth on the upper mandible, sometimes with a second and smaller anterior tooth; the wings are long in proportion to the size of the bird but are rather rounded, the second and third primaries are longest, the first and fourth subequal and nearly as long; the tail is long and nearly square; the tarsi and toes powerful with strong claws and the lateral toes nearly equal in length and not much shorter than the middle toe; the tarsus is feathered about half-way down.

Key to Species.

A. No white collar.
  a. Thigh-coverts black ..... *M. fringillarius*, p. 51.
  b. Thigh-coverts and lower plumage white *M. melanoleucus*, p. 54.
B. A white collar ..... *M. cærulescens*, p. 52.

It is doubtful whether *cærulescens* should not be treated as a subspecies of *fringillarius* but in the fine series in the British Museum, consisting of twenty-five specimens of the latter from South Tenasserim and seventeen of the former from North Tenasserim, I can find no intermediate forms. Each individual specimen can, without hesitation, be assigned to one or the other species and I therefore for the present give *fringillarius* the status of a full species.

(1733) **Microhierax fringillarius.**

THE BLACK-LEGGED FALCONET.

Falco fringillarius Drapiez, Dict. Class. d'Hist. Nat., vi, p. 412 (1824) (Indes, restricted to Malacca, Kirke-Swann).
Microhierax fringillarius. Blanf. & Oates, iii, p. 434.

Vernacular names. Nothing recorded.

Description. Forehead and supercilium from above the eye

white, the latter running down behind the ear-coverts to the breast; cheeks and anterior ear-coverts white: posterior ear-coverts black; remainder of upper plumage, closed wings and tail black, glossed with green-blue; inner webs of wing-quills and of all but the middle tail-feathers barred with white; chin, throat and breast white, changing to ferruginous on the lower breast and abdomen; flanks, thigh-coverts and ends of under tail-coverts black.

Colours of soft parts. Iris rich brown; bill black, the base next the forehead sometimes bluish-slate; legs and feet black.

Measurements. Wing, ♂ 89 to 95 mm., ♀ 96 to 102 mm.; tail, ♂ 52 to 54 mm., ♀ 54 to 59 mm.; tarsus 18 to 19 mm.; culmen, ♂ 10 to 11 mm., ♀ 11 to 12 mm.

Young birds have the forehead, supercilium and cheeks rich ferruginous; the feathers of the upper plumage and wing-coverts are narrowly edged with dull pale fulvous, the edges broader and brighter on the rump and upper tail-coverts.

Distribution. The South of Tenasserim through the Malay Peninsula to Java, Borneo, except the North-East portion, and Sumatra.

Nidification. The Black-legged Falconet breeds in Tenasserim during March, laying its eggs in deserted nest-holes of Barbets or Woodpeckers. Davison obtained an egg from the oviduct of a female, which he shot after it had flown out of a Barbet's nest-hole, which on examination proved to contain a mass of flies' and butterflies' wings. The egg was pure white with a pale green tinge when held up to the light (? from the inner membrane). The egg was obtained on the 25th March. Robinson informs me that it has also been known to breed in the roofs of houses in the Malay States.

Habits. Very little on record. They prefer open country but are also occasionally found in dense forest. They feed on insects, small birds and mammals and are exceeding bold and courageous little birds, generally consorting in pairs. In the Malay Peninsula they generally frequent the outskirts of forest.

Microhierax cœrulescens.

Key to Subspecies.

A. Lower surface suffused with rufous throughout ..... *M. c. cœrulescens*, p. 52.
B Breast pure white..... *M. c. burmanicus*, p. 53.

(1734) Microhierax cœrulescens cœrulescens.

THE HIMALAYAN RED-LEGGED FALCONET.

Falco cœrulescens Linn., Syst. Nat., 10th ed. i, p. 88 (1758) (Bengal).
Microhierax eutolmus. Blanf. & Oates, iii, p. 432 (part.).

Vernacular names. *Ching-fin-nyel* (Lepcha); *Daoling kashiba* (Cachari).

Description. Differs from the Black-legged Falconet in having the thigh-coverts and under tail-coverts deep ferruginous instead of black; there is a broad white collar on the hind-neck; the supercilium and forehead are more broadly white and there is more white on the face and ear-coverts; the lower plumage is more or less suffused with rufous throughout and the black of the flanks is more restricted in extent; the chin and upper throat are deep ferruginous. The inner primaries are spotted with white at the bases of the outer webs.

Colours of soft parts. Iris brown; bill slaty-blue, sometimes tinged greenish and black on the terminal half; legs and feet black.

Measurements. Wing, ♂ 98 to 106 mm., ♀ 100 to 112 mm.; tail, ♂ 58 to 64 mm., ♀ 64 to 67 mm.; tarsus about 20 to 22 mm.; culmen, ♂ 11 to 12 mm., ♀ 12 to 13 mm.



Fig. 9.—Head of *M. c. cærulescens*. ½.

Young birds have the forehead, supercilium, face and collar more or less ferruginous; the breast is generally whiter and in quite young birds the feathers of the upper parts and wing-coverts are edged with pale rufous.

Distribution. The lower Himalayas and Terai from Kuman to Assam. From the latter Province there are in the British Museum specimens from Goalpara and Kamrup in Western Assam and others from the Garo Hills and Cachar in the South. In the West Himalayas it has been taken in Kuman (3) and from Naini Tal. The most Southern record is Sultanpur in the United Provinces.

Nidification. Unknown.

Habits. Those of the genus.

(1735) Microhierax cœrulescens burmanicus.

THE BURMESE RED-LEGGED FALCONET.

Microhierax cœrulescens burmanicus Kirke-Swann, Syn. List Accip., p. 116 (1920) (Thayetmyo, Burma).
Microhierax eutolmus. Blanf. & Oates, iii, p. 432 (part.).

Vernacular names. *Doun-oo-hnouk* (Burma).

Description. Differs from the typical form in having much broader white forehead and white collar whilst the breast is nearly always much whiter, generally pure white.

Colours of soft parts as in the Himalayan form.

Measurements. Wing, ♂ 91 to 99 mm., ♀ 105 to 109 mm.

Distribution. Burma to North Tenasserim; Shan States, Siam and Annam.

Nidification. Bingham took four eggs of this bird on the 14th April from a hole on the underside of a decayed bough "of a mighty Pymma-tree," shooting the female which flew from the hole. The eggs, which lay on a thick mass of fragments of dragon-flies, were dirty yellowish-white in colour, much stained and in shape broad ovals. Bingham likens the texture to that of eggs of *Taccocua* and *Centropus*. The four eggs vary between 33·5 × 22·3 and 27·9 × 21·4 mm. An egg sent me from Perak agrees well with these eggs, measuring 29·2 × 23·8 and having the same curious texture, rather *Centropus*-type but really *sui generis* and unlike any other egg I know of. It was taken from a Barbet's nest-hole on the 11th February.

Habits. Apparently very similar to those of the next bird.

(1736) Microhierax melanoleucus melanoleucus.

THE INDIAN WHITE-LEGGED FALCONET.

Ierax melanoleucus Blyth, J. A. S. B., xii, p. 179 (1843) (Assam).
Microhierax melanoleucus. Blanf. & Oates, iii, p. 433.

Vernacular names. *Doaling kashiba* (Cachari).

Description. A narrow line across the forehead, lores, cheeks, supercilium and whole lower plumage white; whole visible portion of upper plumage, flanks, ear-coverts and a broad continuing line black; outer tail-feathers with white bars on the inner webs and a few broken ones at the base of the outer webs; wing-quills barred with white on the inner webs and some spots of white on the bases of the primary-coverts.

Colours of soft parts. Iris bright brown; bill deep slaty-blue to almost black, quite black at the tip; legs and feet dark horny-brown to black.

Measurements. Wing 111 to 117 mm.; tail 71 to 73 mm.; tarsus 22 mm.; culmen 14 to 15 mm. There are no males in the British Museum series.

Distribution. The whole of Assam from Jaipur in Kamrup, where Chennell found both this form and the Red-legged Falconet, to Dibrugarh on the extreme East. South it ranges to Cachar, Sylhet, Manipur (where I have obtained it) to Hill Tippera and probably Chittagong, whence I have had it reported. A race resident in Fokien, China, has been separated as *M. m. sinensis* and differs merely in having some white feathers indicative of a collar on the hind-neck. Some Dibrugarh specimens show several white feathers on the neck and, on the other hand, some Chinese specimens have none, so that the net difference might be held to be negligible.

Nidification. This grand little Falconet breeds from early March to the middle of May, depositing its eggs in the deserted nest-holes of Barbets or Woodpeckers. Like the nesting-holes of the rest of the genus the bottom of the hole is always full of insect débris, mostly the elytra of Coleoptera and wings of butterflies, etc., and on these, or among them, the eggs lay. Often the hole is one at a great height from the ground and quite inaccessible without the expenditure of great trouble and time, at other times it is lower down, between twenty and thirty feet. The eggs probably number three or four as I have seen this number of young just flown but I have never taken more than one egg. The average measurements of six eggs is 27·9 × 22·4 mm.: maxima **29·0 × 23·0** mm.; minima **24·0 × 20·4** mm.

Habits. This Falconet is found both in well-wooded open country and in forest, though in the latter it keeps much to clearings, banks of open streams and similar places. It occurs in the plains adjacent to the hills and ascends the latter to a height of about 5,000 feet but is more common below 3,000 feet than above. Its food consists principally of insects which it captures on the wing, sailing round in circles much like the Swallow-shrikes or pouncing on them from a perch on some lofty tree. It is also capable of great speed, sometimes swooping on its prey just like the true Falcons and striking them with the hind-claw, killing in this manner birds far larger than itself, such as Scimitar Babblers, Thrushes, etc. Insects are captured by the grasp of a foot and conveyed at once to the mouth and eaten; small birds and mammals are carried to a perch and larger ones eaten on the ground. A bird kept by me in an aviary completely cowed a number of Kestrels kept with it and also succeeded in killing a Woodpecker at least four times its own weight. Its heavy eyebrow, fierce black eye and general demeanour are all those of the largest and haughtiest of Eagles and its upright carriage is also similar. Its cry is a shrill scream and it also utters a low chattering call, whilst it expresses rage with a prolonged hiss.

Genus **NEOHIERAX.**

Neohierax Kirke-Swann, Synopsis Accip., p. 184 (1922).

Type, *Poliohierax-insignis* Walden.

The name *Poliohierax*, which has generally been used for this little Hawk, was first applied to an African species, *Falco semitorquatus* Smith, which, as Kirke-Swann has shown, is not congeneric with our Indian birds.

In this genus the bill is similar to that of *Microhierax* but comparatively smaller and with a single tooth the tarsus is naked and is covered with polygonal scales, large in front, small behind; the toes are weak and short; wing rounded, the second,

third and fourth primaries sub-equal, the first equal to, or longer than, the fifth; the tail is strongly graduated in Burmese species; sexes not alike.

The genus is represented only in the Indo-Malayan region.

Specimens of this Hawk were received the same year by both Walden and Hume, the former publishing a description in April, the latter in May.

Neohierax insignis.

Key to Subspecies.

A. Back very dark grey, contrasting strongly with pale grey head in ♂ and pale rufous head in ♀ ..... *N. i. insignis*, p. 56.

B. Back duller and paler and showing but little contrast with head in ♂, or in depth of colour with ♀ ..... *N. i. cinereiceps*, p. 57.

(1737) Neohierax insignis insignis.

FIELDEN'S HAWK.

Poliohierax insignis Walden, P.Z.S., 1871, p. 627 (1872) (Tounghoo).
Poliohierax insignis. Blanf. & Oates, iii, p. 435 (part.).

Vernacular names. None recorded.



Fig. 10.—Head of *N. i. insignis*. ½.

Description.—Adult male. Upper part and sides of head light grey, paler still on the hind-neck and a little darker on the back, lesser and median wing-coverts, each feather with a black central streak; rump and upper tail-coverts pure white; tail-feathers black, the lateral feathers boldly barred with white, the central with only a few incomplete bars; greater and primary coverts and quills dark brown, the inner webs with broad white bars which extend to the outer webs on central primaries; below white, the sides of the head, the breast and flanks heavily streaked with blackish.

Colours of soft parts. Iris dark brown; bill horny-black, the base of the lower mandible and a patch on either side of the base of the upper mandible yellowish; cere yellow; legs and feet yellow, claws horny-brown.

Measurements. Wing, ♂ 138 to 143 mm., ♀ 148 mm.; tail, ♂ 118 to 124 mm., ♀ 129 to 132 mm.; tarsus 36 to 38 mm.; culmen, ♂ 15 to 16 mm., ♀ 17 to 18 mm.

Female. Similar to the male but with the crown and mantle dark chestnut; the forehead and supercilia are white coarsely streaked with black.

Young birds are like the male but the females soon acquire some chestnut on the nape, from whence it spreads over the rest of the head and mantle; the underparts are more heavily streaked and with brown rather than with black.

Distribution. Practically the whole of Burma from the lower Chindwin to, but not including, Tenasserim.

Nidification. A clutch of eggs sent to Dr. H. N. Coltart from the Rangoon district were said to have been taken from a stick-nest in a low tree. The eggs were a grey-white and very similar in appearance to those of *Astur badius* except in size. They were unfortunately in fragments and could not be measured. Bingham also found it breeding and says that it made a nest of twigs and sticks.

Habits. This Falconet frequents clearings in the dry forests of Burma, perching high up on a bare branch of a tree whence it makes sallies after its prey, which seems to consist entirely of locusts, grasshoppers and various other insects. Its flight is described as dipping and very like that of a Magpie.

(1738) Neohierax insignis cinereiceps.

THE TENASSERIM HAWK.

Polihierax insignis cinereiceps Stuart Baker, Bull. B. O. C., xlvii, p. 101 (1927) (Myawadi).
Poliohierax insignis. Blanf. & Oates, iii, p. 435 (part.).

Vernacular names. None recorded.

Description. Sex for sex similar to the preceding bird but with the back and upper parts darker, contrasting strongly with the head instead of merging into it. The lower parts are pure unstreaked white.

Colours of soft parts as in the Northern form.

Measurements. Wing, ♂ 139 to 145 mm., ♀ 143 to 147 mm.

Distribution. At present only known from Myawadi and the adjoining district in Tenasserim; extending Eastwards to Laos and French Indo-China.

Blanford considered this to be merely the fully adult stage of plumage acquired by *P. i. insignis* but I do not think this can be the case, as I have shown in my original description.

Nidification. Unknown.

Habits. Similar to those of the preceding race.

Genus ERYTHROPUS.

Erythropus Brehm, Isis, 1828, p. 1270.

Type, *Falco vespertinus* Linn. Province St. Petersburgh.

The genus *Erythropus* seems to be the connecting-link between the genera *Falco* and *Cerchneis*, having some characters of both the former and the latter, whilst in coloration it is somewhat intermediate between the Hobby and the Kestrel.

The bill is intermediate in size and strength between *Falco* and *Cerchneis* and is notched as in *Falco*; the middle toe is fairly long, a little shorter than the tarsus and the lateral toes are about equal. The wing is long and pointed, the second primary longest and the first longer than the third; the tail is rather long and rounded but not so long and strongly graduated as in the Kestrels.

Colour of sexes dissimilar.

The Indian or Eastern bird has generally been considered merely a race of the European bird *E. vespertinus* but Sushkin has pointed out to me that there are no specimens showing intergradation between the two and their status seems to be that of representative geographical species rather than subspecies.

(1739) Erythropus amurensis.

THE EASTERN RED-LEGGED FALCON.

Falco vespertinus var. *amurensis* Radde, Reis. Ost. Siberia, ii, p. 110 (1863) (Blagowestschensk, Amoor, E. Siberia).
Erythropus amurensis. Blanf. & Oates, iii, p. 424.

Vernacular names. *Daotu-hagra* (Cachari).

Description.—Adult male. Face, crown, mantle and lesser wing-coverts slaty-black changing to grey on the rest of the head, wings, tail and upper plumage, the wing-quills washed with silver-grey and the edges of the inner webs more brown; chin, throat, fore-neck and breast to upper abdomen grey; posterior abdomen, thigh-coverts and under tail-coverts deep ferruginous-red but often paler on the middle of the abdomen and under tail-coverts; under wing-coverts and axillaries pure white.

Colours of soft parts. Iris dark brown; bill fleshy-red, paler and more yellow at the base, blackish at the tip; orbital skin orange-yellow, deeper during the breeding-season; legs orange-yellow to orange-red, claws pale fleshy-horny.

Measurements. Wing 230 to 246 mm.; tail 124 to 131 mm.; tarsus 28 to 33 mm.; culmen 16 to 18 mm.

Female. Upper plumage slaty-grey, very often tinged with brown on the head and nape and paler and purer grey on the rump, upper tail-coverts and tail; head- and neck-feathers black-shafted; remaining upper plumage barred with black, most

densely so on the mantle; subterminal band on tail broader than the rest; inner webs of outer primaries boldly barred with white, the bars becoming greyer and less conspicuous on the inner primaries and almost disappearing, except at the base, on the secondaries; in newly moulted plumage the wing-coverts and scapulars are finely edged with white; feathers round the eye, a patch below and a cheek-band black; lower parts creamy or pale rufescent white, with bold black longitudinal spots on the breast changing to spots and bars on the lower breast and flanks and disappearing altogether on the pale rufous posterior abdomen, vent, thigh-coverts and under tail-coverts; under wing-coverts and axillaries white barred and marked with black.

Young birds are like the female but browner, with the feathers of the upper parts, excluding the head, broadly edged with rufous; the wing-quills are black with broad white edges and practically no grey wash on the outer webs; the underparts are more heavily barred and the streaks on the breast are broader, generally ending in broad spatulate drops. Plumage intermediate between this and the adult stage is common. In young birds the colours of the soft parts are paler and duller.

Distribution. Siberia East of Lake Baikal to Manchuria, North China and casual as a breeder in the Eastern Himalayas. In Winter South to South China, North-East India and South and East Africa.

Nidification. This Red-legged Falcon breeds freely in N.E. China and Manchuria, where Vaughan and Jones, La Touche and Smirnoff took many nests and eggs. The nests used are nearly always those deserted by Magpies in trees round about villages and cultivation and often several nests occupied by the Kestrels may be found close together. In North Cachar it is only a casual breeder but there also I found two nests close to a village, one in a deserted Crow's nest and one in a nest not identifiable. The eggs vary from three to five, very rarely six and are typically but richly coloured Kestrels' eggs, many being extremely handsome. Fifty eggs average 35·8 × 28·9 mm.: maxima **38·9** × 28·9 and 38·2 × **32·0** mm.; minima **33·0** × **27·1** mm. In China the birds breed from late June to the end of July but in North Cachar my two nests were taken on the 25th April and 16th May.

Habits. The Red-legged Falcons are migratory birds, leaving their normal breeding-haunts in the end of September and October and returning to them in March and April. They migrate in enormous numbers, which must be seen to be appreciated. One of their routes South ran through the Jetinja Valley in North Cachar and here in the last fortnight of October they arrived in countless numbers, looking like vast flocks of Termites as they soared about at an immense height in the clear blue sky. At night they descended to the bamboo-jungle to roost, when they were caught in thousands by the Hill Tribes, who go out with

torches, drums and various barbarous musical instruments, so bewildering the wretched birds that they fall to the ground and are caught. Large numbers are eaten in the villages and the rest taken down to the plains, where they fetch a ready sale as pigeons! The flight is like that of the true Kestrels and they may often be seen to hover when hunting for food and, though normally graceful and slow, yet the birds are capable of considerable speed when required. The cry is similar to the usual querulous cry of the Kestrel and is frequently uttered on the wing. They are easy birds to tame and thrive in captivity, whilst their nature seems to be very peaceable and even timid. The Chinese are said to employ them for hunting small birds but every stomach examined by me has contained nothing but insect-remains.

Genus CERCHNEIS.

Cerchneis Boie, Isis, 1826, p. 976.

Type, *Falco rupicolus* Daud. South Africa.

This genus is now often lumped together with *Erythropus* in the genus *Falco* but it differs greatly from the birds of that genus not only in structure but in habits. The Kestrels are birds of less powerful flight, with weaker implements of prey in their feebler bills and feet and, as we should expect, are hawkers of insects, only tackling small birds and mammals of non-resisting species and these only exceptionally.

In *Cerchneis* the wing is short and rounded, the second and third primaries subequal; the tail is long and well graduated; the feet are smaller and weaker than in *Erythropus* and, *a fortiori*, than in *Falco*; the middle toe without claw equals two-thirds to three-quarters the length of the tarsus and the outer and inner toes are about the same in length.

Key to Species.

A. Claws black ..... *C. tinnunculus*, p. 60.
B. Claws yellow ..... *C. naumanni*, p. 65.

Cerchneis tinnunculus.

Key to Subspecies.

A. Palest form admitted ..... *C. t. tinnunculus*, p. 61.
B. Intermediate in colour ..... *C. t. japonicus*, p. 64.
C. Darker and more rufous.
a. Darkest, males with slaty wash on back very pronounced ..... *C. t. saturatus*, p. 63.
b. Nearly as dark but with little or no slaty wash on back ..... *C. t. interstinctus*, p. 62.
c. Least dark but more brick-red and generally more brightly and richly coloured ..... *C. t. objurgatus*, p. 65.

(1740) Cerchneis tinnunculus tinnunculus.

THE EUROPEAN KESTREL.

Falco tinnunculus Linn., Syst. Nat., 10th ed. i, p. 90 (1758) (Sweden).
Tinnunculus alaudarius. Blanf. & Oates, iii, p. 428 (part.).

Vernacular names. *Karontia, Koruttia, Khermutia* (Hind. in the North); *Narzi* ♀, *Narzinak* ♂ (Hind. in the South); *Tondala-muchi-gedda, Tondala-doshi-gadu* (Tel.); *Ting-kyi* (Lepcha); *Gyo-thane* (Burmese).

Description.—Adult male. Lores and forehead white or creamy-white; crown, nape and sides of the neck ashy-grey with fine black shaft-lines; back, scapulars and wing-coverts bright brick-red, spotted, sparsely on the upper back, with black rather arrow-shaped spots; rump and upper tail-coverts paler grey; tail grey with a narrow white tip and broad subterminal band of black; wing-quills and primary greater-coverts dark brown, more or less edged with white, the quills broadly barred with white on the inner webs except at the tips; a black patch next the eye in front running into a cheek-stripe; ear-coverts and cheeks mixed grey and fulvous, more white on the ear-coverts; lower plumage pale buff to vinous-fawn, paler and immaculate on the chin and throat; streaked with black on the breast and spotted with black on the abdomen and flanks; under wing-coverts and axillaries white barred and spotted with black.

Colours of soft parts. Iris brown; bill slaty-blue, the tip black, the gape, base and cere yellow; orbital skin yellow; legs yellow to orange-yellow, claws black. These colours seem to be the same in all races.

Measurements. ♂, wing 230 to 259 mm.; tail 153 to 175 mm.; tarsus about 36 to 39 mm.; culmen 17 to 18 mm.; ♀, wing 243 to 267 mm.; tail 162 to 175 mm.

Female. Whole upper parts pale rufous, bleaching to sandy-rufous, the head streaked with black and the other parts banded, the subterminal band on the tail being very broad and the tip white; wing-quills as in the male; lower parts as in the male but the streaks and spots more numerous and more brown, less black; typically also the lower parts are paler and more dingy in tone.

In very old females the rump and tail sometimes become tinged with grey.

Young males are like the female but soon acquire a good deal of grey on the tail and a grey rump and upper tail-coverts.

Distribution. Practically all Europe, Western Asia to the Yenesei and Central Asia. In Winter South to North-West Africa and to North-West India. Very common in Sind and the Punjab, spreading East to the United Provinces and South to the Northern Bombay Presidency. Less commonly it extends throughout India

to Ceylon and East to Yunnan and Burma, though a great number of the specimens attributed to this form from the latter places are really *interstinctus* or *japonicus*. There is no proof that it breeds anywhere in the Himalayas, though it is possible that it does so in Gilgit.

Nidification. The Kestrel breeds from the middle of April to the end of May, laying four to six, occasionally seven or eight, eggs in the deserted nests of Magpies, Crows and other birds or in holes in walls, roofs, masses of ivy, etc. The eggs are very handsome, the ground varying from white to pale pink, yellowish or stone-colour profusely blotched, speckled or smudged with blood-red, reddish-brown or light red. In most cases but little of the ground is visible, the whole being covered with minute freckles of reddish in addition to larger spots and blotches. In some eggs the freckles are absent or sparse and the blotches bolder, showing up more on the ground-colour. One hundred eggs average 39·7 × 31·7 mm.: maxima **43·7 × 33·5** and **41·6 × 34·2** mm.; minima **35·4 × 29·7** mm. (*Witherby*).

Habits. The Kestrel is only a Winter visitor to India, arriving in September and October and leaving in March and early April. It is to be found in almost any kind of country from desert to forest but prefers well-wooded yet open country. Here it may be seen regularly quartering the ground for game, every now and then checking in its flight and hovering, with rapidly-beating wings, over one spot, suddenly swooping down on some mouse or insect or continuing its leisurely flight when it decides there is nothing worth stooping for. At times it spends long hours in soaring high up in the sky and this it does much during the hottest hours of the day. It feeds on small mammals, birds and insects, but field-mice form its staple diet. It seldom destroys game, though a few individuals have been known to kill young pheasants, partridge and grouse during the breeding-season. The call a sharp scream, rather prolonged and a low "chip chip" as it flies and hovers.

(1741) Cerchneis tinnunculus interstinctus.

THE HIMALAYAN KESTREL.

Falco interstinctus McClell., P. Z. S., 1839, p. 154 (Assam).
Tinnunculus alaudarius. Blanf. & Oates, iii, p. 428 (part.).

Vernacular names. As for the typical form.

Description. Much darker both above and below than in the Common European Kestrel, not quite so dark and without so strong a slaty-grey wash on the upper plumage of the male as in *saturatus*.

Measurements. ♂, wing 230 to 263 mm.; tail 145 to 174 mm. ♀, wing 245 to 264 mm.; tail 146 to 179 mm.

Distribution. Assam, Cachar, Sylhet, Manipur and the whole of the lower Himalayas, breeding between 2,000 and 8,000 feet and possibly higher. Breeding-birds from Northern Kashmir, Ladak and Tibet seem indistinguishable from *C. t. japonicus*.

Nidification. The Himalayan Kestrel breeds during April, May and June, nearly always placing its nest on a ledge of rock on a cliff or in holes in steep river-banks. Generally a nest of some sort is made composed of sticks, roots and grass often mixed with rags and scraps of cloth but at other times there is no nest at all, this more especially when, as at Quetta, the eggs are deposited in holes in river-banks. Occasionally eggs are laid in old nests of other birds and frequently in some districts in ruined buildings, old walls and similar places. Whistler says it certainly breeds at 2,000 feet or even lower, whilst, on the other hand, it breeds up to 8,000 feet at Simla and possibly 2,000 feet higher. The eggs number three to six and are indistinguishable from those of the Common Kestrel. Sixty eggs average 39·3×31·6 mm.: maxima 41·1×32·7 and 40·3×34·1 mm.; minima 37·4×31·0 and 40·0×29·3 mm.

Habits. Similar to those of the Common Kestrel. This Kestrel is also migratory and extends over a considerable extent of Northern India during the Winter.

(1742) Cerchneis tinnunculus saturatus.

THE BURMESE KESTREL.

Falco saturatus Blyth, J. A. S. B., xxviii, p. 277 (1859) (Tenasserim).
Tinnunculus alaudarius. Blanf. & Oates, iii, p. 428 (part.).

Vernacular names. As in the typical form.

Description. Darker than any other form and the upper parts of the male washed with slate-blue. This wash occurs in all forms of Kestrels occasionally but is only a faint plum-tinge in freshly-moulted birds and is never present to anything like the degree shown in some specimens of this race.

Colours of soft parts as in the other races.

Measurements. ♂, wing 243 to 256 mm.; tail 168 to 176 mm. ♀, wing 253 to 264 mm.; tail 146 to 179 mm.

Distribution. Yunnan and the Hills of East and Central Burma to Tenasserim. It is also found in the Shan States and Kachin Hills in Northern Burma. Grant found a Kestrel breeding in Arrakan and Kestrels also breed in the higher Chin Hills but the race is not certain. Probably *saturatus* and *interstinctus* will here be found to merge into one another.

Nidification. Wardlaw-Ramsay records that it is very common in "Karen-nee where the rocky precipices afford it good

nesting places." Harington found a Kestrel, probably this race, breeding in the Shan States.

Habits. Those of the genus. This race is probably only very locally migratory, descending into the adjacent plains during the Winter but not wandering far from the Hills.

(1743) Cerchneis tinnunculus japonicus.

THE JAPANESE KESTREL. (C. t. japonensis)

Falco tinnunculus japonicus Temm. & Schleg. in Siebold's Faun. Jap., Aves, p. 2, pls. i & i*b* (1844) (Japan).
Tinnunculus alaudarius. Blanf. & Oates, iii, p. 428 (part.).

Vernacular names as in the other races.

Description. This is a rather darker form than the typical one, yet lighter than either *saturatus* or *interstinctus*.

Colours of soft parts as in the other races.

Measurements. ♂, wing 244 to 259 mm.; tail 152 to 168 mm.; ♀, wing 243 to 268 mm.; tail 157 to 166 mm.

Distribution. Breeding Japan and North-East Asia through the Northern Chinese hills through Setchuan to Tibet, Ladak and Northern Kashmir. It seems possible that when sufficient breeding-material is available the more Northern breeding-birds will be found to be much paler and very close to *C. t. tinnunculus* but differing in being larger and in having very pronounced white fringes to the feathers of the upper parts. Birds answering to this description crop up here and there throughout the Winter ranges of the various Kestrels from North-West India to extreme Eastern South China.

In Winter birds indistinguishable from breeding *japonicus* occur all over South China, Burma and India but more commonly in Eastern than in Western India.

Nidification Within Indian limits this Kestrel breeds certainly in Ladak, whilst it is also probably the form which breeds throughout the higher parts of Kashmir. It is common in Tibet up to 14,000 feet and breeds throughout the Northern Chinese ranges. In Kashmir its eggs have been taken from the nests of Carrion-Crows and various other birds but more frequently from off ledges of rocks on cliff-faces. In the latter case there may be a slight attempt at a stick- and rubbish-nest or there may be none at all. The sixty eggs which I attribute to the Japanese Kestrel average 40·1 × 32·3 mm., which is rather larger than those of the European and Himalayan Kestrel. Eggs from Tibet average no less than 41·8 × 33·6 mm.: maxima 43·4 × 34·5 and 42·3 × 34·7 mm.; minima 27·1 × 30·5 and 41·2 × 29·0 mm.

Habits. Those of the species.

(1744) Cerchneis tinnunculus objurgatus.

THE INDIAN KESTREL.

Falco tinnunculus objurgatus Stuart Baker, Bull. B. O. C., xlvii, p. 106 (1927) (Nilgiris).
Tinnunculus alaudarius. Blanf. & Oates, iii, p. 428 (part.).

Vernacular names as in the other races.

Description. Differs from the other races in the very brick-red colour of the plumage of the male and the very rich and red plumage of the female. In both sexes the underparts are very rufous.

Colours of soft parts as in the other races.

Measurements. ♂, wing 225 to 240 mm.; tail 147 to 159 mm.; culmen 16 to 17 mm. ♀, wing 234 to 255 mm.; tail 155 to 169 mm.

Distribution. A resident breeding-form in Ceylon, Travancore, and the hill-ranges of Mysore and Southern India. It has long been known to breed about the Gairsoppa Falls and in the Nilgiris; both Bourdillon and Stewart knew it to breed in North and South Travancore: it has also been obtained in June and July in the Nelliampathy Hills, whilst Davidson also believed it to breed in the steeper and more rugged ravines and hills in the Kanara District of Bombay. It is certainly a non-migratory race but to what extent it wanders in Winter it is difficult to say. There is a specimen in the British Museum obtained in the Laccadives.

Nidification. The Indian Kestrel lays in February, March and April, Cardew also recording eggs as early as January in the Nilgiris. It is known to breed freely in these hills between 4,000 and 7,500 feet, the summits; it is also supposed to breed at Mahableswar and in the Western Ghats and it certainly breeds in Travancore during these same months. Nests taken have all been in holes and crevices or on ledges on cliffs, with the exception of a twice-occupied nest found by Darling which was built on the top of a dead stump of a tree about 14 feet from the ground. I have seen no eggs of this race, nor are there any in the Hume Collection in the British Museum.

Habits. Those of the species except that it does not appear to be migratory in the true sense of the word. In the breeding-season it is confined to the hill-country, where alone suitable breeding-places are available but in the non-breeding season it scatters far and wide over the plains of Southern and Central India.

Cerchneis naumanni.

Falco naumanni Fleisch. in Fischer, Jahrg. (1818).

Type-locality: South Germany.

The typical form differs from that which visits India in being paler and in having the wing-coverts nearly entirely rufous.

(1745) Cerchneis naumanni pekinensis.

THE CHINESE LESSER KESTREL.

Falco cenchris var. *pekinensis* Swinh., P. Z. S., 1870, p. 422 (Pekin).
Tinnunculus cenchris. Blanf. & Oates, iii, p. 430.

Vernacular names. None recorded.

Description.—Adult male. Lores and feathers next the bill rufous; upper part and sides of head and neck, lower back, rump, upper tail-coverts and all but the innermost wing-coverts ashy-grey: the cheeks are generally darker and the ear-coverts streaked with whitish; back, scapulars and innermost wing-coverts brick-red, the outer wing-coverts occasionally having a little red on the outer edges; tail pale grey with a broad subterminal black band and a white tip; lower plumage deep rufous, palest on the chin, throat, abdomen and under tail-coverts; younger birds have numerous round black spots on breast and flanks which gradually disappear with advancing age.

Colours of soft parts. Iris deep brown; bill bluish-slate, black at the tip, paler and often yellowish at the base; cere bright dark yellow; legs horny-yellow to bright yellow, sometimes tinged orange; *claws whitish or yellowish-horny.*

Measurements. Wing 222 to 244 mm.; tail 142 to 156 mm.; tarsus about 32 to 35 mm.; culmen 16 to 17 mm.

Female. Rump, upper tail-coverts and occasionally even lower back grey; remainder of upper plumage and wing-coverts rufous, streaked with black on the head, nape and neck, barred with black elsewhere; tail pale rufous, tinged grey, barred with black and with a broad subterminal band of black and narrow white tip; the central tail-feathers darkest and the outermost palest; greater wing-coverts and quills dark brown barred and notched internally with rufous; lower plumage rufous, palest on throat and abdomen, streaked and spotted with black.

Measurements. Wing 239 to 246 mm.; culmen 16 to 17 mm.

Young males are like the females but generally tinged with grey on the head and more grey on the tail.

Distribution. Breeding North China, Manchuria and probably East Central Asia. In Winter migrating to India. The exact extent of this bird's breeding-haunts and migration are difficult to decide. A bird from Sikkim (Gammie) in the British Museum is a very typical pale female and it seems hardly possible to retain it with the Eastern race and, again, two males, one from Dinapore and one from near Lucknow, are intermediate and might quite correctly be placed with either race. On the other hand, two specimens from Palestine are without doubt of the Eastern race, with very dark under plumage.

Nidification. The only eggs I have seen of this race is a clutch of five from Fort Naryn, Turkestan. These are just like those of

the typical race, small richly-coloured Kestrels' eggs. They were obtained on the 27th May and were said to have been from a nest, one of a colony breeding in an old wall. They measure 36·6 × 28·8 mm.

Habits. This little Kestrel is a bird of very sociable habits, constantly associating in flocks, often of considerable size and migrating in very large numbers. In flight, voice, etc., they closely resemble the Common Kestrel but their food is said to be more exclusively insectivorous.

Genus AQUILA.

Aquila Brisson, Orn., i, p. 419 (1760).

Type, *Aquila chrysaëtos* Linn.

The genus *Aquila* contains the true Eagles, large and powerful birds but varying greatly in courage and never competing in this respect with some of our other tropical Eagles of the genera *Lophotriorchis*, *Spizaëtus*, etc.

The bill is strong, rather long and curved from the cere, the margin of the upper mandibles straight or with a very slight festoon; wings long, the fourth or fifth quill longest, the first generally about equal to the eighth; tail moderate, slightly rounded or nearly even; tarsus feathered to the toes; claws curved, strong and sharp, the hind toe and claw especially powerful.

The genus is found throughout Europe, Asia and North America and is represented in the Indian Empire by six species only, *Aquila fulvescens* of Brooks being now generally accepted as being the same as *Aquila clanga*.

Key to Species.

A. Nostril elliptical or ear-shaped, higher than broad.	
a. Claws very large, hind claw over 50 mm.	*A. chrysaëtos*, p. 68.
b. Claws moderate, hind claw under 50 mm.	
a'. Wing, ♂ over 530 mm., ♀ over 600 mm.	
a^2. Plumage deep brown; crown and nape tawny	*A. heliaca* ad., p. 69.
b^2. Plumage all deep umber-brown, or a pale patch on the nape only.	*A. nipalensis* ad., p. 70.
c^2. Lower plumage striated	*A. heliaca* juv., p. 69.
d^2. Lower plumage not striated; greater wing-coverts and inner secondaries tipped paler.....	*A. nipalensis* juv., p. 70.
b'. Wing, ♂ under 530 mm., ♀ under 575 mm.	*A. rapax*, p. 71.
B. Nostril round, as high as broad.	
c'. Wing, ♀ over 540 mm	*A. clanga*, p. 74.
d'. Wing, ♀ under 510 mm.	*A. pomarina*, p. 75.

Aquila chrysaëtos.

Aquila chrysaëtos Linn., Syst. Nat., 10th ed. i, p. 88 (1758).

Type-locality: Europe, restricted to Sweden (*Hartert*).

The typical form is a smaller, darker bird than that found in the Himalayas.

(1746) Aquila chrysaëtos daphanea.

THE HIMALAYAN GOLDEN EAGLE.

Aquila daphanea Hodgs. in Gray's Misc., p. 81 (1844) (Nepal).
Aquila chrysaëtus. Blanf. & Oates, iii, p. 332.

Vernacular names. *Muriari* (Chamba).

Description. Loral bristles grey or fulvous, tipped black; anterior crown and sides of the head dark brown; posterior crown, nape and hind-neck golden or tawny-rufous, with dark bases and black shafts; thighs, vent and under wing-coverts rufous-brown and shoulder of wing more or less mottled with same; remainder of plumage dark brown, the bases white or mottled with white which shows through here and there, especially on the scapulars, inner secondaries and upper tail-coverts; tail dark brown, banded with dark grey except on the terminal quarter.

Colours of soft parts. Iris dark brown; bill dark horny or bluish-horny, black at the tip; cere and eyelids yellow; legs yellow.

Measurements. Wing, ♀ 660 to 700 mm., ♂ 630 to 655 mm.; tail, ♀ 350 to 365 mm., ♂ 315 to 335 mm.; tarsus, ♀ 95 to 105 mm., ♂ 89 to 95 mm.; culmen, ♀ 58 to 60 mm., ♂ 53 to 56 mm; hind claw 50 to 60 mm.

Young birds have the whole crown golden-rufous; the feathers are pure white everywhere at the base and show through far more than in the adult; the tail has the basal two-thirds white with a broad black terminal band and some brown on the white next to it.

Distribution. Central Asia to the Himalayas from Afghanistan and Baluchistan to Eastern Assam.

Nidification. This Eagle breeds in the higher mountains of Central Asia and in the Himalayas down to about 10,000 feet, Captain Unwin having found them yet 1,000 feet lower at Thundiani on the Afghan boundary. About Quetta a good many pairs breed in the higher hills, but the nests are difficult to get to in this wild and unsafe country. Capt. C. Williams obtained eggs in February and March, that obtained in the latter month being addled and found in a nest with a fledgling. These nests, as also a pair obtained at 10,000 feet in 1909, were all built on small trees on cliff-faces, enormous structures of sticks conspicuous at a

great distance and apparently used for many years in succession. In Altai Zarudny took a pair of eggs on the 12th May from a nest on a ledge of a cliff. These are small very poorly-marked eggs measuring only 71·0 × 55·3 and 71·0 × 50·0 mm. Five other eggs average 78·1 × 60·4 mm., the largest being 78·6 × 61·9 mm. Some eggs are very handsome, well covered with red blotches, and others are dull white with only a few flecks and smudges of yellowish-brown.

Habits. The Golden Eagle occurs at all levels from about 7,000 feet, occasionally up to the snow-line, soaring, of course, often far above this again. It is perhaps the most powerful as well as the boldest of the larger birds of prey, living on Snow-cock, Monal and other pheasants, pigeons, young Tahr, Barhel and Musk-Deer it hunts often in pairs and this trait has been taken advantage of by Falconers, who used to train them to hunt gazelles in this manner. When near villages they sometimes become very destructive to lambs and kids but, on the other hand, have been said to sometimes tackle and kill wolves. Hume thought he recognized this Eagle on the Mekran coast and in the Sind Hills.

(1747) Aquila heliaca heliaca.

THE IMPERIAL EAGLE.

Aquila heliaca Savigny, Descrip. Egypte, Ois., p. 82 (1809) (Upper Egypt); Blanf. & Oates, iii, p. 334.

Vernacular names. *Jumiz*, *Jumbiz*, *Barra Jumiz*, *Satangal* (Hind.); *Frus* (Beng.).

Description. The lanceolate feathers of the crown and sides of the head, nape, hind-neck and sides of the neck pale tawny-buff, the lores deeper in tint and the forehead more or less streaked with black; feathers of the hind-neck with black or dark rufous centres; tail tipped whitish with a broad subterminal band of black, remainder of feathers with alternate mottled bands of grey and dark brown; some of the scapulars pure white; remainder of plumage deep blackish-brown; in some specimens, probably not very old, the wing-feathers and dark scapulars are edged with dull buff; vent and under tail-coverts dull buff.

Colours of soft parts. Iris light hazel or hazel; young birds duller and browner; bill bluish-horny tipped blackish; cere yellow to greenish-yellow; legs and feet dull yellow.

Measurements. Indian specimens: wing, ♂ 575 to 600 mm., ♀ 605 to 630 mm.; tail 253 to 270 mm.; tarsus about 91 to 95 mm.; culmen about, ♂ 54 to 55 mm., ♀ 60 to 66 mm.; hind claw, ♂ 35 to 36 mm., ♀ 38 to 43 mm.

Young birds have the whole upper plumage tawny-buff, the lower back, rump and upper tail-coverts almost immaculate, the remaining feathers with broad brown edges; wing-quills blackish, paling to buffy-brown on the innermost secondaries and

all but the first three primaries tipped pale buff; tail dull rufous-brown, the tip pale rufous; lower surface pale rufous-buff, the throat faintly, the breast, flanks and abdomen boldly edged with dark rufous-brown.

In a later stage the dark markings of the lower surface become blacker and more extensive, the tail shows mottlings at the base and the wing-coverts and scapulars less buff.

The fully adult, almost black plumage, with many conspicuous white scapulars, probably takes about six years to acquire.

Distribution. South-East Europe; Central Asia to Mongolia, South to the Himalayas and in Winter further South again, to the Deccan and as far East as Faridpore in Eastern Bengal.

Nidification. The Imperial Eagle breeds throughout its area to the mountains of Northern India. Within our limits but very few nests have been found which can with certainty be identified but there are authentic nests and eggs from Kashmir, Dehra Ismail Khan and from the Baluchistan-Sind Hills. It is a tree-breeder, making a large nest of sticks and branches lined with smaller branches or with no lining at all. The eggs, two in number, vary greatly in colour but as a series are very poorly and weakly marked. The ground is white or greyish-white, in some unspotted or almost so, in others weakly spotted and smudged with grey-brown or light reddish, whilst in a few only are there handsome markings of red-brown or deep reddish. Jourdain gives the average of twenty-three European eggs as 73·3 × 57·6 mm.: maxima **76·4** × 59·0 and 74·6 × **61·7** mm.; minima **67·2** × 55·4 and 68·5 × **52·3** mm. Six Indian eggs in my collection average only 70·1 × 54·0 mm.

In Europe the breeding-season is April and May but in India November to January.

Habits. The Imperial Eagle is a bird of the plains and the lower hills. In Kashmir it appears to be found up to some 7,000 feet but breeds much lower than this, though authentic records are scarce. It is very inferior in all ways to the Golden Eagle, a poorer flier, a weaker, less bold bird and often an eater of carrion. It kills small mammals, birds and reptiles but is of a very sluggish disposition, spending much of its time perching on trees or rocks or even on the ground. It has often been compared with a Buzzard rather than with other Eagles.

(1748) Aquila nipalensis nipalensis.

THE EASTERN STEPPE-EAGLE.

Circaetus nipalensis Hodgs., As. Res., xviii (2), p. 13 (1833) (Nepal).
Aquila bifasciata. Blanf. & Oates, iii, p. 336.

Vernacular names. *Jumiz* (Hind.); *Woon-lo* (Burm.); *Oong au* (Lepcha).

Description. Whole plumage brown, varying from greyish-brown to deep umber-brown, bleached and worn birds being very pale.

Wing-quills black or almost so; longest scapulars the same; in most birds there is a patch of buff feathers centred darker on the nape; tail blackish-brown, tipped paler, possibly immaculate in very old birds but nearly always showing traces of cross-bars of grey-brown.

Colours of soft parts. Iris hazel to dark brown; bill black; cere deep yellow; legs and feet dull yellow or greenish-yellow to bright yellow, claws black.

Measurements. Wing, ♂ 510 to 595 mm., ♀ 602 to 625 mm.; tail 250 to 290 mm.; tarsus 85 to 89 mm.; culmen, ♂ 50 to 56 mm., ♀ 56 to 58 mm.

A bird shot by Whistler in the Punjab weighed 6¾ lbs.

Very few birds are obtained in the above completely adult plumage and some birds, perhaps, never acquire it. In nearly every specimen the tail is more or less strongly barred and mottled, the wing-quills show incipient or stronger bars of mottled grey-brown on the inner quills; secondaries more or less barred with white; upper and under tail-coverts buff.

Young birds are paler than adults and much more heavily barred and marked. The secondaries and greater coverts have broad tips of buff or whitish forming two well-defined wing-bars; in some birds, probably those of the year, the upper feathers have obscure dark bars and pale tips to the feathers of the upper plumage and occasionally the feathers of the breast and abdomen are marked with streaks or arrow-heads of dark brown.

Distribution. Central Asia, N. China, Mongolia, S.E. Siberia to N.W. India. In Winter to South China, India and N.E. Africa. At this season it wanders as far South as North Travancore (*Stewart*), Raipur in the Central Provinces and South Orissa (*Annandale*). It also occurs, but not commonly, in Assam and Burma.

Nidification. The only eggs I have seen of this Eagle were taken on the 5th December at Hansapur in Guzerat. They measure 67·6×55·0, 69·4×56·1 and 67·0×53·0 mm. One egg is practically pure white, one very faintly spotted and one fairly well marked with light brown. The nest was said to have been on a small tree.

Habits. Very similar to those of the Imperial Eagle. Davison found in Burma that this Eagle kept much to quite open country, perching on the tops of large single trees and never allowing the close approach of human beings.

Aquila rapax.

Falco rapax Temm., Pl. Col., 76 livr., pl. 455 (1828).

Type-locality: Africa.

The typical form is very close to our Indian bird and many young specimens are indistinguishable. Adult birds generally

have the head, shoulders and sometimes the greater part of the plumage more rusty or red-brown as against fulvous-brown in *A. r. vindhiana*.

(1749) Aquila rapax vindhiana.

THE INDIAN TAWNY EAGLE.

Aquila vindhiana Frank., P. Z. S., 1831, p. 114 (Vindhya Hills) Blanf. & Oates, iii, p. 337.

Vernacular names. *Wokhab, Ragar* (Hind.); *Dholwa* (Wagri); *Bursawul* (Yerkli); *Alawa, Salwa* (Tel.); *Ali* (Tam.).

Description.—Adult. General plumage brown, in most cases more or less tinged with fulvous but never with rusty-reddish as in *A. r. rapax*. Many adults have the head and shoulders very fulvous, this colour spreading and deepening on the back and wing-coverts; the rump and upper tail-coverts paler again than the back; tail light grey-brown tipped paler; in very old birds only a little mottling on the inner webs near the tips is to be seen



Fig. 11.—Head of *A. r. vindhiana*. ½.

on the outer tail-feathers but in young adult birds a certain amount of cross-barring is nearly always visible on the central tail-feathers; median wing-coverts dark brown, with pale tips and much white on the inner webs; greater coverts dark brown; primaries blackish-brown, pale-tipped and increasingly paler brown on the bases towards the secondaries, which are dark brown with white tips and grey bars on the inner webs; the lower plumage varies from dull fulvous to fulvous- or golden-brown; the chin and throat are nearly always paler and many birds have the breast or upper breast much darker, the feathers sometimes with pale tips; in the majority of adult or semi-adult specimens the feathers below have dark shaft-lines.

Colours of soft parts. Iris bright hazel; bill slaty or bluish-grey on the basal half, black on the terminal half; the extreme base of the lower mandible tinged horny-yellow; cere dull yellow-cream to bright deep yellow in the breeding-season; legs and feet

dull greenish-yellow, horny-yellow to yellow, rarely greenish-white, claws black.

Measurements. Wing, ♂ 525 to 535 mm., ♀ 536 to 560 mm.; tail, ♂ 242 to 254 mm., ♀ 260 to 285 mm.; tarsus about 63 to 71 mm.; culmen 48 to 54 mm.

Young birds are darker than adults *as a rule* and have more conspicuous streaking below and more barring on the tail; some young birds are practically entirely dull brown, earthy-brown or rufous-brown. Many birds have the feathers of the nape tipped pale, this extending on to the feathers at the side of the neck and breast much like a ruff. A few birds, especially those in a fulvous plumage, have odd narrow bars of black on the feathers of the mantle.

Nestling. "Brown, without shaft-stripes but with broad rufous-buff edges and pale tips to the quills and tail-feathers" (*Brooks*).

"Whole plumage rufous-brown, purer on the head, more earthy on the mantle, and paler below, each feather with a narrow black central stripe or line" (*Hume*).

Distribution. The greater part of India, excluding the wetter parts such as Travancore and the Malabar coast; Eastern Bengal and Assam. It also occurs in the drier region of North Central Burma near Thayetmyo.

Nidification. Hume gives the breeding-season as November to the middle of June but it is *very* rare to find any eggs after February, whilst December and January are the two principal months. The nest is built on the tops of trees, generally on trees of moderate size, often on very low ones, rarely on high trees. Whatever the height, however, it is nearly always a tree standing quite in the open. The nest varies greatly in size; sometimes it is a neat compact affair barely two feet in diameter by less than one in depth, neatly finished off and lined with green leaves; at other times it is double this size in breadth and depth and very untidy, with a lining of grass or rubbish. The normal clutch of eggs is two, often one and exceptionally three. They are generally white or nearly so, just faintly speckled or smeared with pale yellowish- or reddish-brown, but here and there one meets with a well-marked almost handsome egg. Sixty eggs average 66·0×52·8 mm.: maxima **75·1×55·4** and 70·3×**57·6** mm.; minima **58·0**×47·3 and 60·0×**46·4** mm.

Aquila rapax rapax is said to make its nest on the ground.

Habits. This Tawny Eagle is much the most common and most widely-distributed Eagle in India but it is confined to the drier areas and is practically never found in forest or heavily-wooded country, nor does it ascend the hills to any height. It hunts over fields and plains in a very methodical and rather Buzzard-like manner and does not seem to care much what it eats. All small mammals, birds, reptiles, etc., are captured and eaten and it freely devours dead animals even when putrid. It is a great bully though a poor sportsman and is well known as a robber of other

and smaller birds of prey and is a nuisance when hawking both because it steals the quarry when killed and because it pursues the falcons, mistaking the jesses for small birds. When forced by hunger it is quite capable of killing game for itself of considerable size; Jerdon saw it kill a Lesser Florikin and it has been known to strike down the larger duck, hares, etc., whilst a dead cat was once found in a nest of this Eagle. Its cry is a very loud raucous cackle and it also utters shrill screams.

[(1750) Aquila clanga.

THE GREATER SPOTTED EAGLE.

Aquila clanga Pall., Zoog. Rosso-Asiat., i, p. 351 (1827) (Russia and Siberia).
Aquila maculata. Blanf. & Oates, iii, p. 340.

Vernacular names. *Kaljanga* (Hind.); *Bakayari Jiyadha* (Beng.); *Nella gedha* (Tel.).

Description. Whole plumage dark chocolate-brown, the feathers of the head and nape tipped paler and making these parts look lighter; wing-quills blackish, the inner secondaries like the back; tail blackish-brown, generally more or less tipped paler; the bases of the body-feathers are everywhere white, showing through here and there and especially on the upper and under tail-coverts.

Colours of soft parts. Iris brown; bill slaty-blue or bluish-plumbeous, black at the tip and paler next the gape; cere yellow; legs and feet dull yellow. Nostrils large and round.

Measurements. ♂, wing 486 to 501 mm.; tail 240 to 260 mm.; tarsus 103 to 106 mm.; culmen 45 to 50 mm. ♀, wing 542 to 565 mm.; tail 250 to 276 mm.; culmen 48 to 52 mm.

Younger birds have the pale tips to the head-feathers more pronounced and also often have pale shaft-streaks on the feathers of the head and nape; the inner secondaries show more pale or white mottling and the upper tail-coverts are often more white than brown.

Still younger birds have the feathers of the upper back with small pale tips becoming much larger on the scapulars, often occupying most of the larger scapulars; the lesser and median wing-coverts are pale-tipped and the greater coverts, primary coverts and outer secondaries have broad mottled fulvous and whitish tips; the pale tips to the tail-feathers are much broader than in the adults; the upper and lower tail-coverts are mostly white. In the youngest specimens the whole of the lower parts are streaked with pale buff and the vent and middle of the abdomen are dull pale buffy-brown.

Distribution. South and South-East Europe East to Turkestan, South Siberia and Northern China; South to North-West India. In Winter South to the greater part of India and Burma but not

to Ceylon or South of Tenasserim. It is also found in Northern Africa during the Winter.

Nidification. In India the Greater Spotted Eagle breeds in the wetter, well-wooded portions of the North-West and Central India. Hume also records it as breeding in Sind, wherever there are lakes or canals but this is not confirmed by Telehurst or Bulkley. The nests are large structures of branches usually placed high up in tall trees, which may be either solitary or in clumps or groves. In India it seems to lay one egg only or occasionally two; sometimes these are pure white or very faintly blotched and spotted with light yellowish-brown or reddish, at other times they are well marked with numerous small blotches of light reddish-brown. In Europe they generally lay three eggs. Seventy eggs (including 54 Jourdain) average 68·3 × 54·1 mm.: maxima **74·6** × 55·6 and 74·4 × **58·0** mm.; minima **64·5** × 52·2 and 67·2 × **51·2** mm. Over most of the North-West this Eagle breeds from May to June but Rattray took one slightly incubated egg on the 8th March at Shikarpore and Davidson took one in Khandesh on 20th February very hard-set.

Habits. This Eagle is a frequenter of well-wooded country round swamps, lakes and rivers and even when found in the drier districts of Rajputana and Sind they will only be found near water. Their food consists in great part of frogs and they frequently also catch fish. In addition, they kill birds and small mammals and will often carry off wounded ducks and other game. It is a rather sluggish Eagle, often sitting for hours on a perch on some lofty tree and thence sailing slowly over the marshes in its search for food.

Aquila pomarina.

Aquila pomarina Brehm, Handb. Naturg. Vög. Deutschl., p. 27 (1831).

Type-locality: Pomerania.

The Indian form *hastata* has longer, weaker tarsi and a feebler bill than the European bird.

(1751) Aquila pomarina hastata.

THE SMALL INDIAN SPOTTED EAGLE.

Morphnus hastatus Less., Voy. Ind. Bélang., p. 217 (1834) (Bengal).
Aquila hastata. Blanf. & Oates, iii, p. 341.

Vernacular names. *Jiyadhar*, *Gutimar*, *Phari-tisa* (Hind.).

Description. Very dark chocolate-brown, the feathers of the head and nape faintly paler-tipped but dark-shafted, as are the feathers of the back; tail blackish-brown, nearly always showing some traces of paler, greyer barring; primaries and outermost

secondaries black or nearly so; lower parts equally dark brown, the feathers of the chin, throat and upper breast often dark-shafted; vent and under tail-coverts paler and generally showing some traces of mottling.

Colours of soft parts. Iris brown; bill slaty-blue with the tip black and the cere and gape yellow; legs dull yellow.

Measurements. ♂, wing 470 to 505 mm.; tail 230 to 248 mm.; tarsus 100 to 104 mm.; culmen 40 to 43 mm. ♀, wing 493 to 508 mm.; culmen 48 to 52 mm.

Young birds are a much paler brown; the feathers of the head, nape and neck are boldly tipped with fulvous; feathers of back and scapulars white-edged round the tips; the wing-coverts all boldly tipped with white except the primary coverts; inner secondaries barred pale brown, whitish or grey and tipped pale; tail dark brown barred with grey-brown, less definite on the central feathers and all tipped with white; breast dark brown broadly edged with pale rufous, remainder of lower parts rufous-buff with brown shaft-stripes; upper tail-coverts mottled brown and white.

Other young birds have the lower parts pale brown, the feathers of the breast, abdomen and flanks streaked with whitish. These are probably intermediate between the last and more adult birds.

Distribution. Practically the whole of India, except Sind, and in Northern Burma as far South as Northern Pegu. It does not occur in Ceylon and is uncommon in Travancore and Madras, being most plentiful in Behar and Bengal. In Assam it is rare but occurs both North and South of the Brahmapootra as well as in the Surrma Valley and Manipur.

Nidification. The Lesser Indian Spotted Eagle breeds wherever it occurs but most commonly from the United Provinces to Behar and Eastern Bengal. It makes a comparatively large nest of sticks, twigs and branches often with the leaves still on. The lining may be either of green leaves or of grass, rags, etc. The tree selected for the nest is nearly always a large one, sometimes standing by itself in cultivated land or open plain, at other times one of a clump or grove. Occasionally it will build in the immediate vicinity of a village or indigo-factory or even in a garden. Two eggs are most often laid, frequently only one whilst Inglis on one occasion took three. They are small replicas of those of *Aquila clanga* but on the whole better marked. Twenty eggs average 63·8×49·8 mm.: maxima 66·6×52·6 and 64·7×54·4 mm.; minima 58·5×47·6 and 61·1×47·3 mm.

Habits. Much the same as those of *A. clanga* but it is not quite so lethargic a bird, whilst it is even more of a thief and plunderer of other birds and their nests. Frith in Mymensingh and Inglis in Behar both observed it rifling the nests of Mynas and it systematically bullies Kites and takes away the garbage they pick up. Its call is a very high-pitched cackling laugh.

Genus HIERAËTUS.

Hieraëtus Kaup, Mus. Senckenb., iii, p. 260 (1845).

Type, *Falco pennatus* Gmelin.

The genus *Hieraëtus* contains the birds termed Hawk-Eagles. They differ from the true Eagles in their generally more slender proportions, shown especially in their smaller bills and longer and more slender tarsi; the tail is longer in proportion than it is in the Eagles, whilst in most of the Hawk-Eagles there is a phase of plumage in which the underparts are partly or wholly white. The emarginations to the primaries are generally much deeper than they are in the birds of the genus *Aquila*.

In *Hieraëtus* the bill is moderately strong, much hooked and with a prominent festoon to the upper mandible; the nostrils are elliptical and oblique; the wing is long, the fourth primary longest and exceeding the secondaries by more than the length of the tarsus; tail nearly square and equal to more than half the wing in length; tarsi feathered to the toes; toes long, outer toe rather longer than the inner; claws sharp and well curved; inner and hind claw both large, the latter the larger.

The genus is represented in Europe, Asia, Africa and Australia, two species occurring in India.

Key to Species.

A. Larger; wing over 480 mm. ..... *H. fasciatus*, p. 77.
B. Smaller; wing under 450 mm. ..... *H. pennatus*, p. 79.

(1752) Hieraëtus fasciatus fasciatus.

BONELLI'S EAGLE.

Aquila fasciata Vieill., Mém. Soc. Linn., Paris, ii (2), p. 152 (1822) (Montpellier).
Hieraëtus fasciatus. Blanf. & Oates, iii, p. 342.

Vernacular names. *Morangi* (Hind.); *Kundeli Salawa* (Tel.); *Rajali* (Tam.).

Description. Upper parts umber-brown, the bases of the feathers white and often showing through conspicuously on the lower back, nape and hind-neck; the feathers of both the head and mantle inconspicuously dark-shafted; tail dark grey above, whiter below, with a broad subterminal black band and narrower less well-defined bands elsewhere; tip whitish; lesser and median wing-coverts brown, dark-centred; quills and greater coverts blackish; primaries and secondaries blackish barred and mottled over the greater part of the inner webs with white; lores white; most specimens with traces of a white eye-brow; cheeks and ear-coverts white to buff, streaked with black; lower plumage white to rufous-buff, streaked practically throughout with blackish or dark brown, the streaks varying from narrow striations of almost

black to broad central streaks of rich rufous-brown; the thigh-coverts are often much darker than the rest of the lower parts and are well mottled with white or pale buff; under wing-coverts white along the edge of the wing, dark brown elsewhere; axillaries brown, edged white or mottled with the same.

Colours of soft parts. Iris golden yellow, browner in younger birds and bluish-brown in the very young; bill bluish-grey, black tipped, the cere and gape dull yellow; legs and feet dingy yellowish, sometimes "whitey-brown" (*Hume*), claws black.

Measurements. ♂, wing 482 to 520 mm.; tail 275 to 288 mm.; tarsus about 99 to 102 mm.; culmen 43 to 45 mm. ♀, wing 530 to 550 mm.; culmen 45 to 48 mm.

Young birds are paler above with still paler edges to the feathers of the head and nape, the latter often more rufous than the surrounding parts; lower parts pale to rather rich rufous, streaked throughout with blackish or dark rufous-brown in varying degree; tail barred and mottled equally throughout, tipped with white, but with no broad subterminal dark band; inner secondaries and scapulars much banded and mottled with white.

Distribution. South Europe, Asia Minor, Turkestan, Palestine and Central Asia to N.W. China. In India it is found from the Himalayas to Ceylon, where it has occurred once and in Northern Burma. It also occurs in North Africa.

The South African species has been separated as *H. f. minor* (*Erlanger*) on account of its smaller size.

Nidification. Bonelli's Eagle breeds from November to February, from Sind to Travancore, in considerable numbers but less commonly on the Eastern side of India, though Hopwood found it breeding at Segaing in Upper Burma. It makes a huge nest of sticks either on a ledge of a cliff, on the lofty clay-banks of rivers or on high trees, lining the centre carefully with green leaves. Occasionally it is said to use old nests of the Tawny Eagle or Vulture. The eggs number two, often one only and once Hume found three. Most eggs are white or white with very faint flecks of pale reddish; a few are fairly well marked with light reddish-brown or yellowish but none could be called handsome eggs. Forty eggs average 69·1 × 53·4 mm.; maxima **71·2** × 55·4 and 69·9 × **56·9** mm.; minima **65·0** × 54·1 and 66·5 × **51·2** mm.

Habits. Bonelli's Eagle keeps to well-wooded and well-watered country and even in Sind keeps to the vicinity of rivers, canals or swamps. It is a very bold active bird, feeding much on water-fowl of all kinds and on partridges, pigeons, etc., but never on carrion as so many Eagles do. The flight is swift and powerful and its carriage generally very majestic and much more imposing than that of the Imperial Eagle. Hume describes its call as "a shrill, creaking cry."

(1753) Hieraëtus pennatus.

THE BOOTED EAGLE.

Falco pennatus Gmelin, Syst. Nat., i, p. 272 (1788) (Spain).
Hieraëtus pennatus. Blanf. & Oates, iii, p. 344.

Vernacular names. *Baghati, Jumiz, Gilheri Mar* (Hind.); *Udatal Gedda* (Tel.); *Punja prandu* (Tam.); *Rajaluja* (Cing.).

Description. Forehead and lores whitish; head and neck tawny-brown or tawny-rufous streaked with dark brown, the streaks broadest on the crown; generally a narrow black superciliary line; upper parts dark brown; outer scapulars, innermost secondaries, lesser and median wing-coverts paler with broad whitish or pale buff edges and dark shafts; greater coverts and primary coverts blackish with narrow pale edges to the former; primaries blackish, barred and mottled with white at the bases of the inner webs; longer upper tail-coverts pale fawn or whitey-fawn; tail-feathers brown, barred above with dark grey-brown, below with pale grey; lower plumage almost pure white to buffy-white, streaked with rich brown, most thickly on chin, upper flanks and breast and almost disappearing on the abdomen, thigh and under tail-coverts, where they are usually replaced by faint rufous bars; under wing-coverts and longest axillaries white with black patches, shorter axillaries white with rufous-brown streaks.

Colours of soft parts. Iris brown; bill bluish-grey or pale blue with black tip, cere and gape yellow; legs dull yellow.

Measurements. ♂, wing 370 to 412 mm.; tail 188 to 192 mm.; tarsus 61 to 64 mm.; culmen 31 to 33 mm. ♀, wing 385 to 422 mm.; tail 205 to 211 mm.; tarsus 63 to 68 mm.; culmen 32 to 34 mm.

Young birds have the lower parts varying from rufous-brown to dark brown with dark shaft-stripes, fading away on the thigh-coverts and vent; upper parts as in the adult but the head more rufous-brown or dull rufous and the tail-coverts more white.

Many birds seem to moult from the first plumage into an intermediate stage of dark brown and there are specimens in the British Museum showing this well. In this plumage the forehead is practically black and the whole head very dark.

Distribution. South Europe, North Africa, West and Central Asia to India, Ceylon, Burma and Malay Peninsula.

Nidification. The Booted Eagle has been found breeding in India on several occasions: Salem (*Theobald*), Danga Gali (*Rattray*) and Khagan Valley (*C. H. T. Whitehead*). In India, as elsewhere, it builds a very large platform-nest of sticks high up in a tree. The three nests referred to were found in February, March and June respectively but though the female was shot off the last nest the egg had holes in it and the contents were practically dry, so that it may have been laid months before. This last nest was at an altitude of 10,000 feet. In Europe it

breeds almost exclusively in May. One hundred and thirty-eight eggs average 55·5 × 44·8 mm.: maxima **62·3 × 50·8** mm.; minima **49·9** × 42·0 and 54·3 × **39·6** mm. In colour they are bluish- or greyish-white, sometimes faintly speckled and blotched with light reddish or yellowish-brown. Two is the normal clutch, less often one or three.

Habits. The Booted Eagle is principally a Winter visitor to India, when it is by no means uncommon. It is a bold powerful bird for its size, preying on all kinds of small mammals and birds and often attacking and carrying off domestic chickens and ducks. It prefers open well-wooded country but is sometimes seen in forests and often round about villages and cultivation.

Genus **LOPHOTRIORCHIS.**

Lophotriorchis Sharpe, Cat. B.M., i, pp. 226, 255 (1874).

Type, *Astur kieneri* Geof. St.-Hil.

The genus *Lophotriorchis* differs from *Hieraëtus* in its more powerful tarsus and longer central toe as well as in having a long crest. From *Spizaëtus* it differs in its longer wing, the primaries exceeding the secondaries by more than the length of the tarsus and also in having a shorter tail. The claws are exceptionally long and well curved, that of the third toe exceeding in length the culmen, not including the cere.

The genus contains two species—one Indo-Malayan, the other South American.

(1754) **Lophotriorchis kieneri** *.

THE RUFOUS-BELLIED HAWK-EAGLE.

Astur kieneri de Sparre, Mag. Zool., 1835, Aves, pl. 35 (Himalayas).
Lophotriorchis kieneri. Blanf. & Oates, iii, p. 345.

Vernacular names. None recorded.

Description. Head above and on the sides, upper parts, scapulars and wing-coverts black, the head slightly glossy; primary coverts and quills blackish-brown, the secondaries paler brown on the edges of the inner webs; tail dark brown banded with paler greyish-brown, almost obsolete on the central tail-feathers; chin, throat and upper breast white, more or less tinged with fulvous or ferruginous and with long black stripes on the breast and on the centre and sides of the chin and throat; lower breast, flanks, abdomen, thigh-coverts and under tail-coverts deep ferruginous, the abdomen and flanks streaked with black and the latter with a few almost entirely black feathers; under wing-coverts and axillaries mixed rufous and black.

* Stresemann separates the Formosan bird as *L. k. formosus.*

Colours of soft parts. Iris dark brown; bill plumbeous-grey, the tip black; cere yellow; legs and feet dull yellow.

Measurements. ♂, wing about 380 mm.; tail about 204 mm.; tarsus about 76 mm.; culmen about 33 to 35 mm. ♀, wing 405 to 433 mm.; tail 228 to 242 mm.; tarsus 79 to 82 mm.; culmen 35 to 37 mm.

Young birds are brown above, the feathers with pale edges and dark centres; there is a broad white supercilium extending in a line across the forehead; cheeks and sides of neck mixed fulvous and white with small black central streaks here and there; the tail is dark brown with broad grey bars and a narrow pale tip; the lower parts are white throughout, sometimes faintly tinged with fulvous and with a few scattered streaks of black.

Distribution. Eastern Himalayas from Nepal to Eastern Assam; Eastern Bengal. South-West coast of India from Southern Bombay Presidency to Ceylon; Malacca and many of the Malay Islands to the Philippines.

Nidification. The Rufous-bellied Hawk-Eagle undoubtedly breeds wherever found but it is a rare bird everywhere except in Travancore, and Stewart is the only naturalist who has taken eggs. He describes the nest as a typical Eagle's nest, a massive structure of sticks placed high up in some tall tree standing in dense forest. Each pair of Eagles seems to possess a very large area for breeding-purposes and the majority of pairs have two alternative nests, sometimes using one and sometimes the other but sticking to the two for very many years in succession. Both birds assist in incubation and one is always present at the nest and, so fierce and pugnacious are they, it is impossible to take eggs or young until the birds have either been killed or well peppered with small shot, wounds from which they seem to recover very quickly. There is only one egg laid and this is placed on a lining of green leaves which, sometimes at all events, are replaced by a fresh supply when withered. The eggs are dull grey-white and are nearly always slightly marked with flecks or small blotches of light red, whilst in a few instances the markings are larger and bolder and have also underlying marks of lavender and blue-grey, giving the egg quite a handsome appearance. Sixteen eggs average 61·2 × 48·1 mm.: maxima 66·1 × 49·2 and 65·1 × 50·9 mm.; minima 53·8 × 44·9 mm. They lay from the middle of December to the middle of March.

Habits. This Eagle is a bird of the forest, both evergreen and deciduous, being found from the broken country at the foot-hills up to about 5,000 feet in the mountains. In Travancore it is most common between 1,500 and 3,000 feet. It is a most courageous bird and very much like the Falcons in flight and in manner of stooping and killing its prey. It feeds much on game and especially on spurfowl, jungle-fowl and pheasants, stooping to

them when they are running along the ground or actually squatting among grass of cover. I saw one once swoop at something in thin jasmine undergrowth in an evergreen forest and found that it had killed a fine Kalij cock pheasant, splitting its back open and almost tearing off its head. It is extraordinarily quick in its movements and dashes through thick tree-growth in a headlong manner without coming to grief. The only cry I have heard is a plaintive scream, not unlike that of a Kite, for which I first mistook it.

Genus ICTINAËTUS.

Ictinaëtus Jerdon, J. A. S. B., xii, p. 128 (1843).

Type, *Aquila pernigra* Hodgs.

This genus is remarkable for the shape of the foot, the outer toe and claw being very small; the other toes are short and the inner toe is stouter and but little shorter than the middle; the claws are less strongly curved than in other genera of Eagles; the bill is rather small, the edge of the upper mandible almost straight; nostrils broadly oval and oblique; the wing long, the fifth longest and the first a little longer than the secondaries; the tail is long and a little rounded; the tarsi are feathered to the toes.

The genus contains but one species, extending through India, Burma and Malaya to the Celebes.



Fig. 12.—Left foot of *I. malayensis*. ½.

Ictinaëtus malayensis.

Falco malayensis Reinw., Temm. Pl. Col., pl. 117 (1824).

Type-locality: Malay Archipelago.

Differs from the Indian race in being rather smaller.

(1755) Ictinaëtus malayensis perniger.

THE INDIAN BLACK EAGLE.

Heteropus pernicer Hodgs., J. A. S. B., v, p. 227 (1836) (Nepal).
Ictinaëtus malayensis. Blanf. & Oates, iii, p. 347.

Vernacular names. *Laknangbang* (Lepcha); *Hügong* (Bhutea); *Adari nalla gedda* (Tel.); *Dao-ling gashim* (Cachari).

Description. A patch under the eye white; lores dull white, the bristles black; tail blackish barred with grey; remaining plumage dark blackish-brown, generally not so dark below, where the pale bases to the feathers often show through a good deal.

Colours of soft parts. Iris dark brown; bill greenish or plumbeous-horny with black tip; cere and gape yellow; legs yellow, claws black.

Measurements. Wing, ♂ 520 to 553 mm., ♀ 538 to 568 mm.; tail 285 to 312 mm.; tarsus 69 to 73 mm.; culmen 37 to 38 mm.

Young birds are a paler brown, the feathers of the head, nape and neck tipped with pale buffy-brown; the upper tail-coverts are fringed with white; below the throat and breast are marked with oval drops of fulvous-brown and the abdomen and flanks have dark central streaks. The adult plumage seems to be attained more quickly than in most Eagles, probably in the second year.

Distribution. Himalayas from Chamba to Eastern Assam, Bengal and Chota Nagpur (*Ball*). The West coast of India from Kanara to Cape Comorin; Ceylon. Jerdon also says he saw this quite unmistakable bird in the Eastern Ghats and at Bastar in Central India. It is a rare straggler in parts of Burma and has occurred in Perak and Malacca in the Malay Peninsula.

Nidification. The Indian Black Eagle breeds over all its range from the level of the foot-hills up to at least 6,000 feet. Every pair of birds has alternate nesting-sites, sometimes a mile or more apart and if one nest is robbed will then resort to the other but otherwise occupy one or the other indifferently. The nests vary considerably; one taken by myself was a compact neat nest, not more than 24 inches across and less than a foot deep. Other nests are more than double this size and Stewart records them over four feet in diameter. They are always built very high up on big forest-trees and almost invariably in dense evergreen forest, though in Travancore they also resort to deciduous forest. The birds are probably the fiercest of all the Eagles in defence of nest and eggs and it is practically impossible to take eggs or young unless the female is shot and killed or driven away by severe blows. They return again and again to the assault and are most determined birds. As a rule, only one egg is laid but occasionally two. They are the most handsome of all Eagles' eggs and also of the most varied description. The ground-colour is white or nearly so, in a few cases only with a warm pink tinge though in

some eggs the ground is almost covered with the finest of pale brick-red freckles. In these eggs there are generally only a few grey-brown cloudings and blotches. In other eggs the markings consist of large bold blotches of deep brown and reddish-brown; in a third type they consist of deep grey blotches and clouds, whilst in yet a fourth there are primary blotches of deep brown and purple-red, with others underlying them of grey, pale purple and lavender. Sixteen eggs average 62·7 × 49·9 mm.: maxima 65·0 × 50·1 and 63·4 × 51·2 mm.; minima 55·0 × 48·0 mm. The nesting-season is very prolonged. Stewart took eggs as early as the 8th December, whilst I and Rattray have taken them as late as the 2nd and 4th of May. Most eggs, however, are laid between November and March.

Habits. This magnificent Eagle is entirely a bird of forests and generally of those which are evergreen. It is true it may be seen on rare occasions hawking on the outskirts of these but for the most part it keeps well to their interior. It feeds often on worms, frogs, lizards and large insects and has the reputation of being a confirmed robber of eggs and young birds. It, however, also attacks nobler prey and I have seen it kill pheasants, jungle-fowl and wood-partridges, which, in spite of its long straight hind claw, it seems to rip up along the back as effectively as do the short-clawed Eagles. Its flight is generally deliberate and easy but it is capable of immense speed and is wonderfully active through heavy forest. The only call I have heard is a plaintive squeal and, when attacking disturbers of its nest, a series of harsh croaks and discordant cries.

Genus **SPIZAËTUS.**

Spizaëtus Vieill., Analyse, p. 24 (1816).

Type, *Falco mauduyti* Daud.

In this genus the toes are short and stout, the claws long and well curved, the outer toe longer than the inner toe; the bill is short, rather deep at the base; the culmen compressed and curved throughout with a prominent festoon on the margin of the upper mandible; nostril round; the wings are short and rounded, the fifth longest or the fourth and fifth subequal; the primaries exceed the secondaries by less than the length of the tarsus; the tarsus is long and slender, clothed with feathers to the base of the toes; a crest generally but not always present.

This genus is a forest form represented by species both in Africa and America as well as throughout the Oriental region.

Key to Species.

A. Feathering of tarsus not extending to division of toes ..... *S. cirrhatus*, p. 85.

B. Feathering of tarsus extending on to base of toes.

a. Large; wing over 400 mm. ..... *S. nipalensis*, p. 88.

b. Smaller; wing under 400 mm. ..... *S. alboniger*, p. 92.

Spizaëtus cirrhatus.

Key to Subspecies.

A. A long crest 4 to 6 inches present.
  a. Larger; wing over 400 mm. ..... *S. c. cirrhatus*, p. 85.
  b. Smaller; wing under 400 mm. ..... *S. c. ceylanensis*, p. 86.
B. Crest short or rudimentary.
  c. Larger; wing over 400 mm. ..... *S. c. limnaëtus*, p. 87.
  d. Smaller; wing under 400 mm. ..... *S. c. andamanensis*, p. 88.

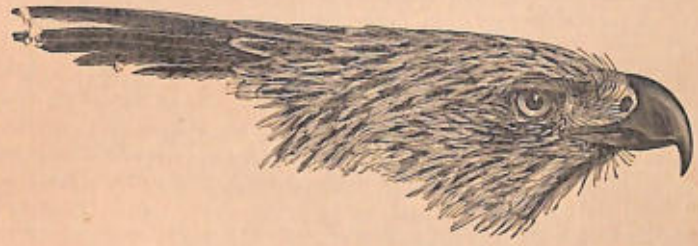


Fig. 13.—Head of *S. c. cirrhatus* ♀.

(1756) Spizaëtus cirrhatus cirrhatus.

THE INDIAN CRESTED HAWK-EAGLE.

Falco cirrhatus Gmelin, Syst. Nat., i, p. 274 (1788) (India).
Spizaëtus cirrhatus. Blanf. & Oates, iii, p. 349 (part.).

Vernacular names. *Shah Baz* (Hind.); *Jutu Bhyri* (Tel.).

Description. Feathers of head rufous-brown with broad blackish centres, the long black crest-feathers black with very narrow rufous borders and tips; upper parts umber-brown with deeper centres and paler edges; wing-coverts the same but a little paler than the back and scapulars; quills dark brown with broad bars of lighter brown above, whitish below; sides of neck like the head but with narrower black centres; chin and throat white streaked thickly with black, the streaks sometimes forming definite median and side lines; breast and fore-flanks white with broad chocolate streaks; abdomen, posterior flanks and under tail-coverts buffy-brown, the thigh-coverts and under tail-coverts barred with white; under wing-coverts barred dark brown and white; axillaries greyish rufous-brown with dark shafts.

Colours of soft parts. Iris golden yellow in adults, grey-brown or yellow-brown in young; bill dark plumbeous, black at the tip; cere plumbeous in adult, yellow in the young; legs and feet dull yellow, claws black.

Measurements. ♂, wing 405 to 430 mm.; tail 280 to 290 mm.; tarsus 102 to 110 mm.; culmen 37 to 40 mm. ♀, wing 448 to 462 mm.; culmen 37 to 42 mm.

Young birds have the head pale buff with dark centres and pale tips; the feathers of the upper plumage have more definite pale edges, often becoming broad white fringes on the greater wing-coverts and the innermost secondaries; below they are pure white to fulvous-white, more or less streaked and spotted with darker fulvous-brown or brown; the thigh-coverts and under tail-coverts are generally darker than elsewhere and more barred with fulvous or brown; the tail has more numerous bands, generally seven bars in the young as against four or five in the adult.

Distribution. Indian Peninsula North to Etawah in the Punjab and to Western Bengal. South Travancore birds are of the next race.

Nidification. This Hawk-Eagle breeds in great numbers in many parts of Western and Central India. The nest is a large untidy structure of sticks and branches, always well lined with green leaves, most often those of the mango, a tree very often selected for nesting-purposes, though any large tree will do. They are always placed high up in stout forks or in masses of branches near the very top of the tree. The egg seems always to be a single one, two never having been found. The colour is grey-white or white, often quite unmarked, less often with a few small reddish blotches at one end. Thirty-five eggs average 67·3 × 51·9 mm.: maxima **71·1** × 52·2 and 71·0 × **52·8** mm., but Vidal records one which measured 76·2 × 53·3 mm.: minima **65·3** × **49·9** mm. The breeding-season lasts from December to the end of April but most eggs are laid in January and early February. The bird has the reputation of being cowardly in defence of nest and young.

Habits. This Eagle is found in forest and the well-wooded, though more open, parts round about cultivation, where it preys on game of all kinds from the size of pigeons to young peafowl, hares, etc. It also eats rats, mice and occasionally a snake or lizard. It watches for its food from a perch on a high tree and does not quarter the ground for it like some eagles and, as Jerdon describes it, pounces on its catch rather than "stooping" to the kill. Its note is described as a prolonged shrill scream and young birds in the nest are said to be very noisy, constantly uttering raucous cries and screams.

(1757) Spizaëtus cirrhatus ceylanensis.

THE CEYLON CRESTED HAWK-EAGLE.

Falco ceylanensis Gmelin, Syst. Nat., i, p. 275 (1788) (Ceylon).
Spizaëtus cirrhatus. Blanf. & Oates, iii, p. 349.

Vernacular names. *Rajaliya* (Cing.).

Description. Only differs from the preceding race in its smaller size.

Colours of soft parts as in the typical form.

Measurements. Wing 353 to 383 mm.; tail 227 to 260 mm.; tarsus 90 to 98 mm.; culmen 31 to 33 mm. The wings of the two sexed male specimens in the British Museum series measure 363 and 365 mm.

Distribution. Ceylon and the South of Travancore.

Nidification. Stewart, who has taken many of the eggs of this Eagle, records their breeding-season as being from the end of November to the end of March. Nests and eggs are like those of the preceding bird, the latter only differing in being smaller. Twenty-four average 61·3 × 49·8 mm.: maxima **70·3** × 50·6 and 62·8 × **54·1** mm.; minima **57·5** × **45·1** mm. Like the Indian Hawk-Eagle, this bird puts up no defence for young or nest but like that bird also is extremely difficult to drive away. Stewart has taken three eggs in one season from the same nest and then left the birds still in possession.

Habits. Those of the preceding bird.

(1758) Spizaëtus cirrhatus limnaëtus.

THE CHANGEABLE HAWK-EAGLE.

Falco limnaëtus Horsf., Trans. Linn. Soc., xiii, p. 138 (Java).
Spizaëtus limnaëtus. Blanf. & Oates, iii, p. 351 (part.).

Vernacular names. *Sadal* (Beng.); *Morhaita* (Garhwal).

Description. Similar to *S. c. cirrhatus* but generally paler, especially on the underparts and with very little crest, the longest feathers seldom exceeding an inch and often being quite rudimentary. The brown of the abdomen, vent, etc., seems to be always more or less barred with rufous-white or white. In the young birds the lower parts are often pure white, entirely devoid of any spotting or barring.

Colours of soft parts as in *S. c. cirrhatus.*

Measurements. Wing 400 to 438 mm.; tail 240 to 267 mm.; tarsus 100 to 103 mm.; culmen 39 to 41 mm.

A melanistic form of this race is very common and is found throughout its area. In this form the whole plumage is dark brown, in some practically black and in others more a chocolate-brown. In these latter traces of dark central streaks and of barring show faintly through the brown; the base of the tail is greyish above and there is considerable white mottling on the base below. Both the melanistic and the common form have been taken from the same nest.

Distribution. The sub-Himalayan Terai from Garhwal to Eastern Bengal and Assam; Burma and the Malay Peninsula to Borneo, Java and Sumatra.

Nidification. This fine Eagle breeds in the plains of Assam and Bengal and in the Terai and Burmese hills from the foot-hills up to some 6,000 feet but more often between 1,500 and 3,000 feet. The nest is like that of the other races but the birds nearly all select as sites trees overhanging streams. These are usually in forest but occasionally in the open and Cripps took one nest from a large tree in a market-place. The egg, one only is laid, is a greyish-white, very rarely faintly speckled with a few reddish freckles. Ten eggs average 69·8 × 51·9 mm.: maxima **72·3** × 52·0 and 70·6 × **54·0** mm.; minima **62·0** × 51·2 and 67·0 × **48·2** mm. Two abnormally large eggs taken by myself and laid by the same bird in two consecutive years measure 74·1 × 5[illegible]·6 and 76·2 × 56·5 mm. Hopwood, Fielden and others found the breeding-season in Burma to be January to April and Whymper and I took eggs in India in these same months.

Habits. Those of the species.

(1759) Spizaëtus cirrhatus andamanensis.

THE ANDAMAN HAWK-EAGLE.

Spizaëtus andamanensis Tytler, P. A. S. B., p. 112 (1865) (Port Blair).
Spizaëtus limnaëtus. Blanf. & Oates, iii, p. 351 (part.).

Vernacular names. *Arung-ŭdda* (Andamans).

Description. Similar to the pale form of *S. c. limnaëtus* but much smaller.

Colours of soft parts as in *S. c. limnaëtus.*

Measurements. A sexed male in the British Museum series has a wing of 375 mm. and a female 366 mm.; culmen 38 and 37 mm. respectively.

Distribution. Andamans only.

Nidification. An egg taken by Osmaston in the Andamans is pure white with a greyish tinge and is very small, measuring only 62·2 × 50·1 mm.

Habits. Apparently much the same as those of the other races. Davison found it generally on the outskirts of forest near open places.

Spizaëtus nipalensis.

Key to Subspecies.

A. Darker.
  a. Larger; ♂ wing over 470 mm., ♀ wing over 500 mm. ..... *S. n. nipalensis*, p. 89.
  b. Smaller; ♂ wing under 430 mm., ♀ wing under 450 mm. ..... *S. n. fokiensis*, p. 91.
B. Paler ..... *S. n. kelaarti*, p. 91.

(1760) Spizaëtus nipalensis nipalensis.

HODGSON'S HAWK-EAGLE.

Nizaëtus nipalensis Hodgs., J. A. S. B., v, p. 229 (1836) (Nepal).
Spizaëtus nepalensis. Blanf. & Oates, iii, p. 353.

Vernacular names. *Kanda-panthiong* (Lepcha).

Description. Feathers of the crown and crest almost black, the rufous-white bases showing through everywhere and the tips pale in all but the very oldest birds; the tips of the long crest-feathers are always pale; upper parts brown, sometimes with a coppery tinge; median and greater coverts paler brown than the lesser and both these and the scapulars nearly always with white edges to the tips; rump and upper tail-coverts barred brown and white; tail dark brown barred with dark grey, these bars showing almost white below, narrow tip white and the terminal dark band almost black; ear-coverts and sides of the neck streaked dark brown and fulvous; a broad moustachial band to the fore-neck and another down the centre of the chin and throat black or blackish-brown; lower fore-neck and generally upper breast fulvous-white with broad black streaks; remainder of lower parts brown, shading from fulvous-brown on the breast to chocolate-brown on the abdomen, posterior flanks and under tail-coverts, barred everywhere with white, normally these bars interrupted by the brown shafts; in very old birds the black streaks on the upper breast disappear and are replaced by broken white bars; greater under wing-coverts blackish and white; remaining under wing-coverts and axillaries fulvous, spotted with white.

Colours of soft parts. Iris brilliant golden yellow; bill black, the cere blackish-grey; legs and feet pale dull yellow, yellowish-white or livid yellow, claws black.

Measurements. The only sexed ♀ in the Museum series has a wing of 502 mm.; other specimens vary from 475 to 491 mm.; tail 283 to 298 mm.; tarsus about 108 mm.; culmen 38 to 39 mm.

Young birds in first plumage have the head and neck white, more or less tinged with fulvous and lightly streaked with blackish-brown; the longest crest-feathers always blackish; feathers of upper parts more boldly edged with fulvous-white, the median coverts nearly all of this colour; tail with more numerous bars of dark and light than in the adult; the wing-quills are dark brown banded with lighter brown on the inner webs as in the adult; below the whole plumage is white generally faintly suffused with fulvous.

Older birds acquire the upper plumage of the adult but with broader pale margins to the feathers; the fore-neck and breast become more and more spotted and streaked and the abdomen and flanks become faintly barred fulvous and white.

A pair of birds in my possession and kept perfectly free and unfettered took four years to attain the adult plumage and became still darker in their fifth year.

Nestlings are covered with dense pure white down but, if the Nagas are correct, this is sometimes tinged with golden fulvous on the head and neck and along the back.

Distribution. Himalayas from the Hazara to Eastern Assam, North and South of the Brahmapootra. It is not very rare in Cachar and Manipur and occurs, though rarely, in the Khasia Hills In Winter it straggles into the plains of India and has been recorded as far South as Seoni and Pachmarhi.

Nidification. Hodgson's Hawk-Eagle breeds between 2,000 and 7,000 feet, at which latter height its nest was taken by Jones. Whymper took several nests in the Kuman Terai and Buchanan one in the Murree Hills. The nest is like that of *S. cirrhatus* but larger and is built high up in forest-trees, often close to streams, in many cases the same pair of birds having two nests. One egg only is laid but this varies greatly in colour. Roughly there are three types: one a typical *S. cirrhatus* egg, unmarked greyish-white or faintly marked with pale reddish; secondly, pale clay-white minutely but densely freckled all over with pale brick-red; and, thirdly, pure white handsomely and sometimes profusely blotched and spotted with rich red, the markings being more numerous and bolder at the larger end. Fourteen eggs average 69·9 × 53·8 mm.: maxima 72·7 × 57·4 mm.; minima 65·0 × 51·2 mm. In defence of their nests, eggs and young, these birds are as fierce as their cousins of the *cirrhatus* group are cowardly. Whymper gives a most interesting account of the taking of an egg of this bird. "*Spizaëtus nepalensis* nearly deceived us this year by leaving the old nest and furiously attacking a man who went up to it. As they had done nothing at all to the old nest, after thinking it over I came to the conclusion they must have another nest near by, so we went back another day and found one within 400 yards up the nullah and got a lovely egg out of it. We had a tremendous battle. As I did not want to shoot her we armed ourselves with plenty of throwing sticks and I nearly knocked her over with one but she did not mind and attacked eight times. Once my man up the tree hit her such a whack with his fist that it lifted her up clean into the air, but in spite of this she wheeled round and took his cap off, slightly wounding him on the head. They are the bravest birds I have ever seen and the speed with which they attack must be seen to be believed; they start from a tree several yards away and come on straight as a dart." They lay from February to April and if the first egg is taken nearly always lay again, sometimes in the same nest, sometimes in the alternative one.

Habits. Very similar to those of the previous species but this species preys more invariably on larger game-birds and on hares and a pair will do a great deal of damage to game in a season.

(1761) Spizaëtus nipalensis fokiensis.

THE CHINESE HAWK-EAGLE.

Spizaëtus nipalensis fokiensis Kirke-Swann, Syn. List Accip., p. 72 (Nov. ?, 1919) (Fokien, China).

Vernacular names. None recorded.

Description. Very similar to *S. n. nipalensis* but much smaller.

Colours of soft parts as in the typical form.

Measurements. ♂, wing 419 to 425 mm.; ♀, wing 445 mm.

Distribution. South China, Hainan, Indo-Burmese countries to Tenasserim.

Nidification. Rickett's collectors took a young bird in down, the feathers just showing, from a "large nest, big enough for a man to curl himself up in," in May. This was at Ah Chung in Fokien.

Habits. Apparently those of the species. It is certainly resident wherever found.

(1762) Spizaëtus nipalensis kelaarti.

LEGGE'S HAWK-EAGLE.

Spizaëtus kelaarti Legge, Ibis, p. 202 (1878) (Ceylon); Blanf. & Oates, iii, p. 354.

Vernacular names. *Rājāliyā* (Cing.); *Rāsāli, Kalaya* (Tam.).

Description. Similar to the preceding bird but paler; the scapulars and wing-coverts more definitely edged with white or whitish-fulvous; the underparts are strikingly paler and the shafts on the white bands are white also, not brown as in the Nepal Hawk-Eagle.

Colours of soft parts as in the preceding race.

Measurements. ♂, wing 427 to 453 mm.; ♀, wing 442 mm.; tail 276 to 289 mm.; tarsus 107 to 109 mm.; culmen about 42 mm.

Young birds go through the same changes as occur in Hodgson's Hawk-Eagle and, like them, have a stage in which the tail instead of being barred is all brown with white mottlings at the bases of the inner webs of the outer tail-feathers.

Distribution. Ceylon, Travancore and the Malabar coast into the Nilgiris and hill-ranges of Mysore.

Nidification. The discovery of this bird's breeding is due to Stewart, who took many of their nests and eggs in Travancore. He found them nesting between 1,000 and 4,000 feet, building great structures of branches high up in lofty trees, both in deciduous and evergreen forest. Like other forms of the genus, this Eagle often kept two nests going but even when the first

eggs were regularly taken they continued sometimes to lay again in the same nest and that for three or four years running. At other times they went off to the second nest and laid in that. The eggs are white tinged with grey or yellowish and sometimes very sparingly speckled with light red. Twenty-two eggs average 69·1 × 54·6 mm.: maxima **73·4** × 55·2 and 68·9 × **56·0** mm.; minima **65·3** × 54·8 and 68·1 × **53·3** mm. The breeding-season lasts from December to the first week in March.

Habits. Very much the same as those of *S. n. nipalensis* but this subspecies is not quite so bold in defence of its home and young and though it swoops continually will seldom really strike anyone climbing the tree on which its nest is built. Its flight is very swift and powerful but like others of the genus it generally pounces on its prey by pursuit from a perch on a tree and not by a swoop when soaring above.

(1763) Spizaëtus alboniger.

BLYTH'S HAWK-EAGLE.

Nisaëtus alboniger Blyth, J. A. S. B., xiv, p. 173 (1845) (Malacca).
Spizaëtus albiniger. Blanf. & Oates, iii, p. 354.

Vernacular names. None recorded.

Description. Upper parts and sides of head, crest, neck, upper back and lesser wing-coverts black; browner on the lower back, wing-coverts and quills; primaries blackish at the tips, with a few narrow bars of blackish and with white mottlings on the bases of the inner webs below the emargination; tail blackish-brown, a narrow pale tip and a broad grey band next to a broad black subterminal one; lower parts white, a central black streak from the chin to the throat; the breast and upper flanks with broad black streaks; abdomen, flanks and under tail-coverts with bars of black, much broader than the white; thigh-coverts with bars of black and white about equal in breadth; under wing-coverts and axillaries black and white.

Colours of soft parts. Iris yellow; bill black, the base tinged with grey or plumbeous; cere black; legs and feet yellow. The feathering of the tarsus extends well on to the base of the toes as in the other species of this genus.

Measurements. Wing 315 to 323 mm.; tail 217 to 242 mm.; tarsus about 84 mm.; culmen 28 to 32 mm. There are hardly any sexed skins in Museums but there cannot be much difference in size in the male and female.

Young birds are exactly like the young adults of *Spizaëtus n. nipalensis* but have chin- and cheek-stripes less developed, the black streaks on the breast broader and generally more rufous on the abdomen.

Still younger birds have the whole head, neck and upper back fulvous, except for the longer crest-feathers which are black; the upper parts are pale brown with broad white edges; the tail has four dark bars with intermediate paler grey-brown bars; below the plumage is pale fulvous, whiter on the throat and chin, darkest on the vent and under tail-coverts; the ear-coverts and sides of the neck are generally a darker, rather more rufous, fulvous.

Distribution. From the South of Tenasserim, through the Malay Peninsula and South-West Siam to Borneo.

Nidification. Nothing recorded.

Habits. Those of the genus so far as is known.

Genus CIRCAËTUS.

Circaëtus Vieill., Analyse, p. 23 (1816).

Type, *Falco gallicus* Gmelin.

In this genus the bill is moderate, greatly hooked and with the culmen much rounded; nostril oval and slightly oblique, the loral bristles growing over it in an upwards direction; wing long, the fourth quill longest and the third and fifth but little shorter; the primaries exceed the secondaries by more than the length of the tarsus; tarsi long, not feathered except for about an inch next the tibia; covered all round with small ill-defined hexagonal imbricate scales; toes short, the inner and outer about equal in length; claws short and not much curved.

There is no crest but the feathers of the nape are lengthened and lanceolate.

The genus contains species represented chiefly in Africa but one ranges to Europe and Asia as far East and South as India.

(1764) Circaëtus gallicus.

THE SHORT-TOED EAGLE.

Falco gallicus Gmelin, Syst. Nat. i, p. 259 (1788) (France).
Circaëtus gallicus. Blanf. & Oates, iii, p. 355.

Vernacular names. *Sampmar* (Hind.); *Sapmaril* (Beng.); *Malpatar* (Can.); *Pamula gedda* (Tel.); *Pambu prambu* (Tam.); *Rawal* (Wagri); *Kondatele* (Yerkli).

Description. Lores, forehead, fore-cheeks, eyebrow and a patch under the eye white; the loral and other bristles black; general upper plumage earthy-brown, the long lanceolate feathers of crown, nape and neck with black shaft-lines; longest scapulars darker brown; tail margined with white at the tip, with three blackish bands, the terminal very broad, alternating with grey-brown bands; inner wing-coverts paler grey-brown; the white

on the bases of the inner webs showing through here and there; outer coverts darker brown; primaries blackish-brown, diagonally white on the basal halves of the inner webs; secondaries white on the edge of the inner webs and barred faintly with blackish; chin, throat, and upper breast earthy-brown, with black shafts and white bases showing through everywhere; remainder of lower parts white barred with pale brown, the bars sometimes absent on the centre of the abdomen.

Colours of soft parts. Iris yellow to bright orange-yellow; bill pale greyish-blue, darkest at the tip; cere whitish or pale plumbeous-grey; legs and feet dirty yellowish-white to pale earthy greyish-brown; claws black.

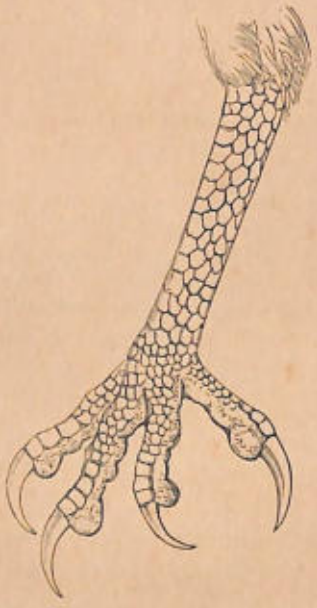


Fig. 14.—Left foot of *C. gallicus*. ½.

Measurements. ♀, wing 530 to 571 mm.; tail 287 to 330 mm.; tarsus 92 to 97 mm.; culmen 40 to 43 mm. ♂, wing 520 to 536 mm.; tail 252 to 288 mm.; culmen as in female.

Young birds have the upper parts paler and the head and neck almost white, the central pale grey streaks and dark shafts covering a very small portion of the white feathers; the lower parts are white, more or less suffused with buff and with brown shafts to the feathers of the chin, throat and breast; a few spots of pale fulvous-brown occur here and there on the flanks and abdomen.

♀

Rather older specimens than the above have the spots on the lower plumage more and more pronounced; the dark shafts and fulvous tint on the breast gradually disappear and broader, darker spots take their place; above the plumage becomes darker and the dark parts of the head cover more and more of the white, till, finally, the complete adult plumage is acquired.

Distribution. South Europe and North-East Africa, Western Asia as far South and East as India and Northern China. In India it occurs practically over the whole continent as far East as Lower Bengal. I never saw it in Assam and it has not been recorded from Ceylon. It occurs occasionally in Siam and has once been recorded from the Malay Peninsula.

Nidification. The Short-toed Eagle breeds in India from December to March except in the lower Himalayan hills, where it breeds from March to May. The nest is not very large, usually under two feet in diameter and is roughly and untidily made of sticks, sometimes unlined, sometimes lined with finer twigs, with grass or with green leaves. The tree selected may be big or small but nearly always it is one in open country or in very thin scrub-jungle. Only one egg is laid, which is pure white and very broad in shape, the two ends hardly differing in size. Thirty Indian eggs average 73·6 × 58·4 mm.: maxima **80·0 × 64·6** mm.; minima **67·7 × 50·4**; the latter is abnormally small.

On two occasions it is recorded that the nest of this bird was found built on ledges of clay cliffs on the Jumna river.

Habits. This Eagle is a bird of open country, both of dry plains and of wetter cultivated country. It spends much time circling round high up in the air, often in pairs and, during the breeding-season, indulges in wonderful evolutions. At other times it sits on the branch of a tree or on some post and thence swoops on its prey, which consists largely of snakes, lizards and frogs. It also eats small mammals and birds and will carry off ducks and small game when wounded. Its cry is described as a plaintive scream.

Genus **SPILORNIS.**

Spilornis Grey, List. Gen. B., p. 3 (1840).

Type, *Falco bacha* Daud. Java.

This genus is separated from other Indian genera by having a broad nuchal crest covering the whole nape. The coloration is also peculiar, brown both above and below in adults, the lower plumage ocellated with round white spots. The bill is rather long and well hooked, the festoon on the upper mandible obsolete or wanting; the nostrils are oval and oblique; the lores nearly naked. The wings are short and rounded.

The genus is confined to the Oriental Region and consists of five species, of which two occur within our limits.

Key to Species.

*A. Pale wing-bar next to tip of quills broader than the adjoining dark interspace	*S. cheela*, p. 96.
B. Pale wing-bar next to tip of quills much narrower than dark band on either side	*S. elgini*, p. 103.

Spilornis cheela.

Key to Subspecies.

A. Wing over 410 mm.	
a. Tail in adults with one broad band of white or pale brown.	
a'. Darker; white spots on lower plumage with conspicuous black spots on either side	*S. c. cheela*, p. 96.
b'. Paler; white spots larger but with less conspicuous blacks pots on either side.	
a''. Smaller; wing 410 to 460 mm.	*S. c. burmanicus*, p. 99.
b''. Larger; wing 460 to 490 mm.	*S. c. ricketti*, p. 100.
b. Tail in adults with two broad pale bands.	*S. c. albidus*, p. 98.
B. Wing under 410 but over 300 mm.	
c'. Upper plumage with strong purple gloss; breast less barred	*S. c. spilogaster*, p. 100.
d'. Upper plumage less glossy; breast more barred	*S. c. davisoni*, p. 101.
C. Wing under 300 but over 260 mm.	*S. c. minimus*, p. 102.
D. Wing under 260 mm.	*S. c. klossi*, p. 102.

(1765) Spilornis cheela cheela.

THE INDIAN CRESTED SERPENT-EAGLE.

Falco cheela Lath., Ind. Orn., i, p. 14 (1790) (Lucknow).
Spilornis cheela. Blanf. & Oates, iii, p. 357 (part.).

Vernacular names. *Furj baj, Dogra chil* (Hind. Saharanpore); *Tilai baj, Sabchur* (Beng.); *Sin* (Assam).

Description. Crown, nape and full crest black, the white bases of the feathers showing through more or less, the feathers of the nape edged with fulvous-brown and those of the posterior crown to a lesser degree; upper parts dark brown, often with a distinct gloss; lesser wing-coverts blackish-brown with white spots; other wing-coverts like the back, sometimes, perhaps in younger birds, with narrow white edges; quills blackish-brown with a broad paler brown band near the end and two narrower bands below this, inner webs mottled and marked with white on the inner webs below the notches; there are also narrow white tips to the quills in freshly-moulted birds; upper tail-coverts tipped white; tail black, narrowly tipped whitish, brownish at the base and with one

* I have not seen any specimen of *S. klossi* but from the description can find no character which could be used to define it as a species from *S. cheela*.

broad pale brown or white band across the centre; lower parts rufous or tawny-brown; chin and throat ashy-brown with narrow rufous bars and tips; the breast generally all brown or grey-brown with little barring and very narrow rufous fringes; remainder of lower parts with white spots, having black patches above and below them; on the abdomen these spots and patches become more like bars, whilst on the lower tail-coverts they appear as alternate bars of brown, white and black.

Colours of soft parts. Iris golden yellow; bill slaty-blue, nearly black on the culmen and tip; cere and lores yellow, brighter in the breeding-season, rather dull and dingy at other times; legs and feet dull yellow, the tarsi naked and covered with hexagonal scales, claws black.

Measurements. Wing 468 to 507 mm.; tail 295 to 315 mm.; tarsus 100 to 102 mm.; culmen 41 to 45 mm. The sexes in this genus do not differ in size.

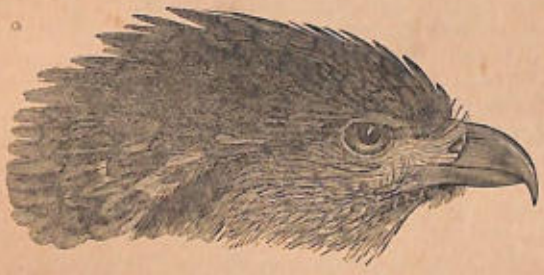


Fig. 15.—Head of *Spilornis c. cheela*. $\frac{2}{3}$.

Young birds have the feathers of the head, nape and crest fulvous-white, with dark brown sub-apical patches; the upper parts are brown, often paler than in the adult, with broad white fringes; the inner wing-coverts have broad white edges and broken bars; the tail has six bands of dark brown and pale brown, the latter often mottled with white; the lower parts are at first white, sullied brownish-white or fulvous-white with a few dark streaks on the breast and flanks; the bars on the wings are more numerous than in the adult.

The occellated brown under plumage seems to be acquired before the upper adult plumage but the chin and throat remain white for some time.

Distribution. Northern India from Sind and Kashmir to Eastern Assam but not the extreme East of Assam or to the countries South of the Brahmapootra. Birds from extreme Eastern Bengal are somewhat intermediate between the typical form and Kirke-Swann's *burmanicus* and the Southern Indian *albidus*.

Nidification. This magnificent Eagle breeds from the foot-hills up to some 7,000 feet in the Himalayas, building a large stick-nest high up on some tall forest-tree, preferably one standing by a stream or some natural opening. Some nests are well lined with green leaves, others quite unlined. The eggs, of which one only is laid, are very handsome. The ground is white, creamy white, or very faintly yellowish white and they are boldly blotched with rich brown and red-brown, with sparse secondary markings of lavender and purple-grey. In a few eggs the markings are more clouds than blotches and the underlying lavender blotches better defined; in most eggs the markings are more numerous at the larger end, in some confined entirely to it and in others distributed over the whole egg. Sixteen eggs average 71·8 × 56·2 mm.: maxima **77·3 × 57·6** mm.; minima **66·3 × 52·7** mm. The birds breed principally in May and June but some lay as early as February.

Habits. This Serpent-Eagle is found both in forests and in the open country round them, spending most of the time soaring at an immense height, often invisible to human sight. Their own sight must be very marvellous, for a pair of these birds which I had tame, though unrestrained in any way, would recognise me as I walked or rode home, though they themselves were quite out of sight. The first notice I had of their presence was the loud screaming cry, commencing with two or three loud "kōk-kōks" and then specks would appear in sight high above me, gradually enlarging as they sailed down in wide circles to within a few feet of me, or actually alighted on my shoulder. They feed much on snakes and will attack those of great size. The rat-snake, even when as big as 7 or 8 feet, are tackled and killed with ease and they seem to destroy poisonous snakes with as little fear as the harmless ones. When no snakes are to be found they will eat reptiles, birds of all kind up to the size of the largest pheasants, partridges and ducks and also grubs and the larger insects.

(1766) Spilornis cheela albidus.

THE LESSER SERPENT-EAGLE.

Falco albidus Temm., Pl. Col., iv, pl. 19 (1824) (Pondicherry).
Spilornis cheela. Blanf. & Oates, iii, p. 357.

Vernacular names. *Nalla pamula gedda* (Tel.); *Botta Genda* (Gond.); *Goom* (Can.); *Murayala* (Mahr.).

Description. Similar to *S. c. cheela* but rather smaller; the upper breast is generally uniform, the white spots not reaching so high and the barring being obsolete; the chin and throat never appear to become black but are grey or grey-brown in very old birds; the tail in adults nearly always has two pale bands, though that at the base is sometimes indistinct; the underparts are normally less rufescent.

Colours of soft parts as in the other races.

Measurements. Wing 421 to 461 mm.; tail 275 to 310 mm.; tarsus 94 to 101 mm.; culmen 42 to 46 mm.

Distribution. Practically all India South of the Himalayas. Specimens from Bengal can be distinguished by their rufous under plumage, similar to that of the Himalayan birds. On the other hand, their small size seems to link them with the Southern form. They are very close to *S. c. burmanicus* but have the long terminal black band to the primaries, as in *S. cheela cheela*.

Nidification. Stewart found this Eagle breeding in some numbers in the Plains of Travancore from December to March, and Vidal took nests in the latter month in the Konkan. Further North it breeds later. Irvine took eggs in Chota Nagpore in April and May, whilst in Rungpur I took one egg in September, perhaps an abnormal time. The nest is like that of the preceding bird and the eggs only differ in being smaller and, as a series, less richly coloured. Thirty eggs average 65·7 × 50·9 mm.: maxima 72·4 × 52·4 and 68·1 × 54·3 mm.; minima 61·1 × 48·7 mm.

Habits. Those of the species. Stewart found both this form and *S. c. spilogaster* in Travancore but the present race kept entirely to the plains whereas the Ceylon form kept entirely to the hills. He at first thought the two forms were *S. c. cheela* and *S. c. albidus* but an examination of the skins proved them to be the latter form and *S. c. spilogaster*, the latter race being very common in the hills of South Travancore.

(1767) Spilornis cheela burmanicus.

THE BURMESE CRESTED SERPENT-EAGLE.

Spilornis cheela burmanicus Kirke-Swann, Synopsis Accip., 2nd ed. p. 81 (1920) (Thvetmyo, Burma).
Spilornis cheela. Blanf. & Oates, iii, p. 357 (part.).

Vernacular names. *Doun-zoon*, *Lin-yen* (Burmese); *Sin* (Assam).

Description. A rather smaller, paler race than typical *cheela*; the white spots on the lower plumage are larger and more conspicuous, the black adjoining spots are paler and less conspicuous; the terminal black band on the primaries is not quite so broad.

Colours of soft parts the same in all races.

Measurements. Wing 408 to 463 mm.*

Distribution. Burma, South to Tavoy, North to Shan States, Ruby Mines District, Chin Hills and Assam South of the Brahmapootra. Hume identified this form with the similar but much smaller Hainan race *rutherfordi*, which does not occur within our limits.

* Possibly the bigger birds are wandering specimens of *S. c. cheela*, as there are very few over 450 mm. and these from the Western area only.

Nidification. Harington obtained a nest of this species with one egg on the 26th March, built high up against the trunk of a big tree in dense forest; Hopwood took another on the 14th February in the Lower Chindwin; Bingham took an egg in Tenasserim in March; a fourth egg was taken by myself in Silchar in May. These four eggs measure 67·9 × 53·2, 73·1 × 56·0, 69·3 × 57·1 and 66·3 × 54·0 mm. One egg is white with a little stippling of light red at the larger end, the second is lightly clouded and blotched with pale purple-red at this end and the others are handsomely marked all over with dark red.

Habits. Exactly the same as those of the typical form.

(1768) Spilornis cheela ricketti.

THE CHINESE SERPENT-EAGLE.

Spilornis cheela ricketti Sclater, Bull. B. O. C., xl, p. 37 (1919) (Yamakan, Fokien).
Spilornis cheela. Blanf. & Oates, iii, p. 357.

Vernacular names. *Doun-zoon* (Burmese).

Description. Differs from *S. c. cheela* in having both upper and lower parts rather paler, the back being a paler ashy-brown with a purple-brown gloss; the cheeks are grey and the chin and throat never black but either grey or brown, concolorous with the breast; the spots on the abdomen are very white and conspicuous but the adjoining dark markings paler and less conspicuous than in *cheela*; the terminal black primary band is dark, as in that race.

Colours of soft parts as in the other races.

Measurements. Wing 455 to 490 mm.; culmen 41 to 45 mm.

Distribution. South China from Amoy to North-East Burma.

Nidification. Nothing recorded.

Habits. Those of the species.

(1769) Spilornis cheela spilogaster.

THE CEYLON SERPENT-EAGLE.

Hæmatornis spilogaster Blyth, J. A. S. B., xxi, p. 351 (1852) (Ceylon).
Spilornis cheela. Blanf. & Oates, iii, p. 357 (part.).

Vernacular names. *Rajaliya* (Cing.); *Kalumbien* (Tam., Ceylon).

Description. Smaller than any of the preceding forms; upper parts brown but with a stronger purple-grey tinge than in any of the Northern forms; throat very grey; breast browner than in the other races and immaculate; remainder of lower parts browner and less rufescent than in *S. c. cheela*, darker than in *ricketti* or *burmanicus*.

Colours of soft parts as in the other races.

Measurements. Wing 355 to 402 mm.; culmen 38 to 45 mm.

Distribution. Ceylon and South Travancore. According to Stewart this small form is resident in the wetter evergreen forests at the lowest elevations and sea-level, whereas *albidus* is confined to the higher and dryer ranges where the forest is almost deciduous. A very small specimen from Khandesh, with a wing of 394 mm., seems to be nearest this race and is probably only a non-breeding wanderer so far north.

Nidification. Stewart took many of the nests of this bird in South Travancore, though he at first attributed them to *S. c. albidus* and the larger eggs which he took in the plains to *S. c. cheela*. The mistake was rectified by Kirke-Swann, who examined the skins. Nests and eggs are like those of the other forms but three eggs taken by Phillips in Ceylon are of a beautiful type very uncommon in the other races. The ground is white and the eggs are well-marked with small blotches of purple-red with secondary markings of lavender-grey. Twenty-two eggs average 62·8 × 49·4 mm.: maxima **65·5** × 47·2 and 64·7 × **51·0** mm.; minima **59·3** × 49·0 and 65·5 × **47·2** mm. Stewart remarks that this bird breeds in far denser forest than does *S. c. albidus* and whilst that bird nearly always makes its nest on a tree near water, the Ceylon Serpent-Eagle builds on trees far away from it.

Habits. Similar to those of the other races. In Travancore this bird keeps invariably to the hills, never breeding below 500 feet and generally at about 2,000 feet. It is found in Ceylon over the greater part of the island and is common in many parts. It feeds on snakes but also very often on bull-frogs, gliding on to these from a perch in a deeply-shaded tree and, though its nest may be far from water, its daily hunting look-out is of necessity over some pool, lake or river.

(1770) Spilornis cheela davisoni.

THE PALE ANDAMAN SERPENT-EAGLE.

Spilornis davisoni Hume, Str. Feath., i, p. 307 (1873) (South Andamans)
Spilornis cheela. Blanf. & Oates, iii, p. 357 (part.).

Vernacular names. None recorded.

Description. Very similar to *S. c. spilogaster* but somewhat browner above with less purple tinge; the breast is generally more distinctly barred.

Colours of soft parts as in the other races.

Measurements. Wing 374 to 407 mm.; culmen 37 to 41 mm.

Distribution. Andaman Islands.

Nidification unknown.

Habits. Hume and Davison say that the habits are exactly the same as those of the typical form.

(1771) Spilornis cheela minimus.

THE NICOBAR SERPENT-EAGLE.

Spilornis minimus Hume, Str. Feath., i, p. 464 (1873) (Camorta, Nicobars); Blanf. & Oates, iii, p. 361.

Vernacular names. None recorded.

Description. This is the smallest and palest of all forms of *Spilornis cheela* except the next. The upper parts are paler grey or brown; the breast is greyish-brown and unbarred in old birds, the chin and throat the same colour as the breast. The apical black band on the primaries is short, under two inches in breadth.

Colours of soft parts. Iris yellow; bill light blue, dark horny at the tip; cere, gape and orbital skin bright yellow; legs and feet yellow.

Measurements. Wing 286 to 290 mm.; tail 191 to 192 mm.; tarsus about 75 to 77 mm.; culmen 35 to 37 mm.

Distribution. Nicobars; Camorta and Nancowry Islands.

Nidification unknown.

Habits. Those of the species. Davison records that this little Eagle was very wild and shy and was only found in forest near rivers, etc. and that it did not frequent the shores and openings.

(1772) Spilornis cheela klossi.

THE GREAT NICOBAR SERPENT-EAGLE.

Spilornis klossi Richmond, Proc. U.S. Nat. Mus., xxv, pp. 304-5 (1902) (Great Nicobar).

Vernacular names. None recorded.

Description. "General colour above...drab with a slight coppery sheen and some of the feathers with narrow white tips; nape and sides of the neck Isabella colour; top of head black, the longer feathers with narrow tips of Isabella colour; ear-coverts, cheeks and malar region clear smoke-grey; throat buffy-white with an indistinct median stripe of smoke-grey; breast buffy wood-brown, paler on abdomen, sides, thighs and under tail-coverts; lesser and middle wing-coverts dark drab, prominently edged with white; primaries black with two dusky bars, one only on the outer primary; tail with two pale bars."

Colours of soft parts. "Iris yellow; cere, base of bill and naked skin on sides of head yellow; bill, tip black, middle bluish."

Measurements. "Wing 257 mm.; tail 165 mm.; tarsus 75 mm.; culmen 33 mm."

Immature birds "have buffy tips to the feathers of head, back and wing-coverts; the tail has three bars instead of two."

(Taken from original descriptions by Richmond.)

Distribution. Great Nicobar.

Nidification. Unknown.

Habits. Richmond records that the stomachs of the birds obtained by Kloss contained the remains of lizards, rats, a small bird and an Emerald Dove.

(1773) Spilornis elgini.

THE DARK ANDAMAN SERPENT-EAGLE.

Spilornis elgini Tytler, J. A. S. B., p. 87 (1863) (South Andaman Island). Blanf. & Oates, iii, p. 361.

Vernacular names. None recorded.

Description. A very dark chocolate-brown bird, much darker both above and below than any race of *cheela*; the crown and crest, however, are less black, more brown than in that bird and the crest is decidedly shorter; chin, throat and breast are all dark brown, the chin and throat occasionally almost blackish-brown; the abdomen, flanks and, sometimes, the lower breast are ocellated with white but have no adjoining black patches above or below; the tail has two narrow pale bands and a narrow pale tip; the primaries and secondaries have numerous brown bars a little paler than the darker parts, generally almost invisible on the secondaries.

Colours of soft parts. Iris bright yellow; bill pale horny, bluish-horny or fleshy, darker on the culmen; cere, lores and orbital region bright or lemon-yellow; legs and feet yellow.

Measurements. Wings 344 to 368 mm.; tail 215 to 241 mm.; tarsus about 81 to 84 mm. (once 75); culmen 36 to 38 mm.

Young birds have the head-feathers white or fulvous-white with dark centres on the crown; streaked darker on face and throat; the breast is finely barred with dusky and the dark brown feathers of the upper parts are fringed with white and sometimes with a few white spots; the wings are much more profusely spotted with white in the young than in the adult.

Possibly there is no stage in which the young have pure white underparts as in the *cheela* group.

Nidification. Unknown.

Habits. Apparently much the same as those of the preceding species.

Genus BUTASTUR.

Butastur Hodgs., J. A. S. B., xii, p. 311 (1843).

Type, *Circa teesa* Frankl.

The genus *Butastur* is in many ways intermediate between the Buzzards and true Eagles but differs from both in certain important characters. In the characters of the tarsus they approach

Cuncuma and seem to have been rightly placed by Blanford between this genus and *Spilornis*, though they might equally well be interleaved between the Kites and Buzzards.

In this genus the tarsus is naked, without transverse shields, covered with imbricate shields which are rather larger in front; the toes are short; the bill is compressed and the culmen curved from the base; there is generally a festoon, sometimes well marked, on the edge of the upper mandible; the nostrils are oval and oblique; the wings are long, the third quill longest, the fourth nearly equal to it, the second and fourth about equal and much shorter; the first four primaries emarginate inside; the size is rather small and the measurements of the two sexes much the same.

The genus is represented in Africa and the Oriental Region.

Key to Species.

A. Tail tinged rufous, with narrow or no cross-bands.
   a. Quills chiefly brown above ..... *B. teesa*, p. 104.
   b. Quills chiefly rufous above ..... *B. liventer*, p. 106.
B. Tail not tinged rufous, with broad dark bands.. *B. indicus*, p. 107.

(1774) Butastur teesa.

THE WHITE-EYED BUZZARD-EAGLE.

Circa teesa Frankl., P. Z. S., p. 115 (1831) (Ganges-Nerbudda).
Butastur teesa. Blanf. & Oates, iii, p. 362.

Vernacular names. *Tisa* (Hind.); *Buda-mali Gedda* (Tel.); *Yellur* (Yerkli).

Description. Upper parts rufous-brown to brown, each feather with a black shaft or shaft-stripe; lores, a patch on either side of the forehead and a nuchal spot white; the nuchal spot often striped or tipped with dark brown; upper tail-coverts and tail always more rufous than the back, the latter with a broad subterminal band of blackish and with narrow bands of black, sometimes obsolete or absent; wing-coverts mottled or indefinitely barred with white; quills brown or rufous-brown edged with grey, black-tipped and with a few narrow black bars on the inner webs, which are mostly white; under aspect of wing almost entirely pure white, the dark bars showing faintly through; chin and throat white with a black median and two side-streaks of blackish; sides of head, neck and breast brown, each feather black-shafted; breast brown with dark shafts and numerous fulvous-white bars, becoming more numerous towards the abdomen and vent, which are wholly pale fulvous or rufous with narrow bars of a slightly darker tint; axillaries brown and white.

Colours of soft parts. Iris almost white or pale yellow; brown in young birds; bill black at the tip changing to yellow on the gape, base of lower mandible and cere; legs and feet dingy orange-yellow.

Measurements. ♂, wing 278 to 296 mm.; tail 151 to 169 mm.; tarsus 58 to 61 mm.; culmen 28 to 31 mm. ♀, wing 294 to 314 mm.

Young birds have the foreheads and a broad supercilium white or buffy-white, the feathers of the crown and nape brown with broad pale edges; the feathers of the upper parts are more or less pale-edged, traces of these edges showing on the hind neck and shoulders of otherwise adult birds; the lower parts vary from buffy-white to pale buff or creamy, the feathers more or less streaked with dark brown, the chin- and cheek-stripes narrow or even wanting.

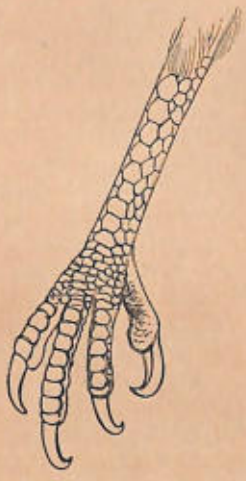


Fig. 16.—Left foot of *B. teesa*. ¾.

Distribution. Practically the whole of India from the plains at the foot of the Himalayas to South Travancore. Rare in the wetter and more heavily-forested parts, such as Malabar and Western Bengal. Most common in North-West India to Behar and Eastern Bengal as far South as Central India and the Deccan. It is found throughout North and Western Burma to Tenasserim but is common nowhere.

Nidification. The White-eyed Buzzard-Eagle breeds throughout the plains of India and Northern Burma during March, April and early May; in Burma March is the favourite month, in India April. The birds build their own nests, generally a small rather poor affair with no real lining, in forks of trees at any height

from the ground. They have been taken on small solitary Babool-trees, standing in wide open spaces and so low down that they could be taken by hand. Others are placed 50 feet up in huge trees in the open and others again between 20 and 40 feet up in groves and clumps of trees. The eggs number two or three, very rarely four and occasionally one only. The great majority are pale bluish-white or pure white with no markings at all, a minority are faintly marked with pale grey or pale reddish specks or blotches, whilst a very few, not one in twenty, are comparatively well marked with reddish-brown. Eighty-six eggs average 46·4 × 38·4 mm.: maxima **49·9** × 39·0 and 47·9 × **39·1** mm. Hume gives a maximum breadth of 41·0 mm.; minima **43·0** × 35·8 and 45·0 × **35·0** mm.

Habits. This bird, next to the Kite, is the most familiar of all Indian Raptores, being found in open country all over India, though it is rarer in the wetter districts, such as Eastern Bengal and the Malabar coast. It frequents the open slopes of the hills of Southern India to some height but does not ascend the Himalayas anywhere. It quarters the ground much as a Kestrel does and is very similar to that bird in flight but it generally flies closer to the ground and, if it hovers, this is only for a second or two. It feeds on small snakes, frogs, lizards, mice, shrews, an occasional small bird and any large insect, being very partial to large grasshoppers and locusts, which it seizes on the wing. Its cry varies from a low plaintive mewing call to a loud prolonged squeal. The young are very noisy and both birds, but more especially the female, continue the mewing call constantly during the breeding-season.

(1775) Butastur liventer.

THE RUFOUS-WINGED BUZZARD-EAGLE.

Falco liventer Temm., Pl. Col., lxxiv, pl. 438 (1827) (Java).
Butastur liventer. Blanf. & Oates, iii, p. 364.

Vernacular names. None recorded.

Description. Head, neck and upper back ashy-grey, tinged with brown in younger birds, the shafts darker; back and wing-coverts ashy-brown, tinged with rufous and becoming darker and more rufous on the upper tail-coverts and rump; tail deep rufous, tipped pale ashy, a subterminal band of blackish and two or three narrow incomplete bars of black; edge of wing white; outer coverts and primary coverts rufous tipped with brown; quills bright rufous-chestnut, tipped and edged outwardly with brownish, broadly white on the basal edges of the inner webs and with narrow bars of black; innermost exposed secondaries like the back; lower parts ashy-grey, more or less tinged with brown and with faint dark shafts, vent and under tail-coverts pure white or buffy-white; abdomen intermediate and showing traces of the juvenile barring.

Colours of soft parts. Iris yellow, sometimes golden yellow; bill yellowish-horny, black at the tip; cere and gape yellow; legs and feet dull yellow, claws black.

Measurements. ♂, wing, 261 to 275 mm.; tail 139 to 145 mm.; tarsus 62 to 66 mm.; culmen 28 to 31 mm. ♀, wing 264 to 280 mm.

Young birds have the head and neck above brown or rufous-brown with pale edges; the forehead is paler and there is a distinct whitish supercilium; upper parts generally darker and more heavily streaked with blackish; wing-coverts much mottled and barred with whitish; chin and throat white, brown at the sides; lower parts pale grey with fine black shafts and faint white bars; thigh-coverts, vent and under tail-coverts white.

Distribution. Throughout Burma from the Chin and Kachin Hills to Southern Tenasserim; Shan States, Siam and Yunnan; Borneo, Java and Celebes.

Nidification. Oates and Fielden found this Buzzard-Eagle breeding in March in Pegu, Harington and Grant took nests and eggs in April in the Kachin Hills and Wickham found it breeding commonly in the Southern Shan States in March and April. Nest and eggs exactly resemble those of *Butastur teesa*. The former is built in trees in thin forest or in trees standing in the open. The average of eleven eggs is 46·3 × 37·8 mm.: maxima **48·7** × 37·1 and 46·6 × **40·0** mm.; minima **44·2** × 36·8 and 45·6 × **36·5** mm.

Habits. Similar to those of the preceding bird. Freshwater crabs are said to form a large part of its diet and therefore its resorts are principally the banks of the large rivers but Wickham also found it frequently in the interior of thin deciduous oak forests in the Shan States.

(1776) Butastur indicus.

THE GREY-FACED BUZZARD-EAGLE.

Falco indicus Gmelin, Syst. Nat., i, p. 264 (1788) (Java).
Butastur indicus. Blanf. & Oates, iii, p. 365.

Vernacular names. None recorded.

Description. Lores and a patch on either side of the forehead white; sides and upper parts of the head and neck and the upper back greyish-brown with fine black shaft-lines; on the nape there is usually a patch where the white bases of the feathers show through; remaining upper parts brown, more or less tinged with rufous and black-shafted; upper tail-coverts tipped and barred with white; tail brown with two black bars and a third basal bar brownish-black; the under aspect of the tail very pale; edge of wing white; greater coverts pale rufous-brown, with a subterminal indefinite brown band and edged with whitish; quills blackish-brown, paler on the inner webs

which are barred with black and with white edges to the bases; in fresh plumage all the tips are edged pale; chin and throat white with a central and two side streaks of blackish, often very ill-defined; breast pale ashy rufous-brown with a few spots and bars of white; abdomen, vent and thigh-coverts white with rufous grey-brown bars, under tail-coverts white; under wing-coverts white with a few rufous bars; axillaries like the flanks and abdomen.

Colours of soft parts. Iris bright yellow; bill horny-yellow, blackish at the tips, the base, gape and cere orange-yellow; legs dull yellow, claws black.

Measurements. ♂, wing 315 to 325 mm.; tail 190 to 193 mm.; tarsus 55 to 59 mm.; culmen 27 to 30 mm. ♀, wing 322 to 336 mm.

Younger birds are like the adults but darker and browner and have four or five dark bands on the tail.

Young birds have the upper parts brown with dark shaft-stripes and pale edges to all the feathers; those of the crown edged with pale rufous and with white bases; the wing-coverts are all tipped with white and more or less barred with rufous-white; below white to buffy or rufous-white, streaked on the breast with rufous-brown and barred with the same on the abdomen and posterior flanks.

Distribution. All Burma to Tenasserim, through the Malay Peninsula to the Philippines, Celebes and New Guinea; Japan, China and the Indo-Chinese countries.

Nidification. This Buzzard-Eagle breeds in Japan and, according to Père David, in the Mountains near Pekin. How far West it breeds is not known. According to Ouston it breeds commonly in the Southern Islands, building a nest like that of *Butastur teesa* in solitary trees in rice-fields or other cultivation. The eggs only differ from those of that species of *Butastur* in being larger. Twelve eggs average 49·0 × 39·7 mm.: maxima **52·0** × 40·3 and 49·5 × **41·3** mm.; minima **45·5** × **38·5** mm.

Habits. Apparently much the same as those of other Buzzard-Eagles but this bird is migratory instead of sedentary and in the Winter is found over a very wide extent of country.

Genus **HALIAËTUS**.

Haliaëtus Savign., Hist. Ois. d'Egypte, p. 254 (1809).

Type, *Falco albicilla* Linn.

Blanford, with some hesitation (Avifauna, iii, p. 367), retained the three Eagles *albicillus*, *leucoryphus* and *leucogaster* under the one genus *Haliaëtus*. Mathews, however, considers (B. of Aus., v, p. 131) that they are divisible into two genera, *Haliaëtus* for *albicillus* and *Cuncuma* Hodgs. for the other two, basing his

separation on the differences he alleges to exist in their bills and feet. He does not mention what these differences are but it is obvious that *albicillus* has comparatively the largest bill of the three and that *albicillus* and *leucogaster* have much more powerful feet than *leucoryphus*. Again, *leucoryphus* has a well-marked ruff of lanceolate feathers, *albicillus* has no definite ruff but has the feathers of the hind-neck and breast lanceolate, whilst *leucogaster* has no lanceolate feathers at all. It would seem, therefore, that we must either retain all these species in one genus or separate them into three. I accordingly retain all three in the one genus *Haliaëtus*, which has priority.

In the present genus the bill is stout but varies considerably in degree; the culmen is straight at the base and then curved, the festoon variable in individuals but generally well marked; tarsus stout and feathered on the upper third; scutellated in front and on the toes, reticulated elsewhere; claws grooved underneath in all but varying much in size and strength, being immensely powerful in *leucogaster*; wings long, third or fourth quill longest, second nearly as long; tail wedge-shaped or rounded.

The genus consists of several species distributed throughout Europe, Africa, Asia, the Indo-Australian regions and North America. Three species are found in the Oriental region.



Fig. 17.—Head of *H. leucoryphus*. ½.

Key to Species.

A. Tail all white	*H. albicillus*, adult, p. 110.
B. Tail brown with white end	*H. leucogaster*, adult, p. 111.
C. Tail brown with a white cross-band	*H. leucoryphus*, adult, p. 112.
D. Tail variegated and mottled brown and white.	
a. Head nearly always lighter than back	*H. leucogaster*, juv., p. 111.
b. Head and back concolorous.	
a'. Feathers of breast lanceolate but no ruff	*H. albicillus*, juv., p. 110.
b'. Feathers of breast lanceolate with distinct ruff	*H. leucoryphus*, juv., p. 112.

(1777) Haliaetus albicillus.

THE WHITE-TAILED SEA-EAGLE.

Falco albicilla Linn., Syst. Nat., 10th ed. i, p. 89 (1758) (Sweden).
Haliaëtus albicillus. Blanf. & Oates, iii, p. 369.

Vernacular names. None recorded.

Description. Whole head, neck and upper breast pale fulvous-brown or whity-brown, the bases darker and showing through and the shafts black; remainder of upper parts dark brown; wing-coverts brown with pale edges, these covering almost the whole visible portions of the inner lesser coverts and decreasing in extent outwardly, often disappearing entirely on the outermost and on the primary coverts; quills blackish-brown; the innermost secondaries edged with whitish like the scapulars and interscapulars; tail white generally more or less mottled with brown at the base; lower parts brown, the feathers of the lower breast with a good deal of pale edging or mottling.

Colours of soft parts. Iris yellow, brown in the young; bill and cere yellow, more brown in young birds and quite blackish-brown in the youngest; feet yellow. The feathers of the hind-neck and breast are long and lanceolate but do not form a ruff as in *leucoryphus*.

Measurements. ♂, wing 593 to 632 mm.; tail 285 to 325 mm.; tarsus about 85 mm.; culmen about 61 mm. ♀, wing 640 to 686 mm.; tail 318 to 352 mm.; culmen about 65 mm.

Young birds are brown, varying much in depth of colour; the bases of the feathers are pale fulvous or whitish and show through more or less everywhere but especially on the lower parts; tail white more or less mottled and edged with brown, this colour predominating in the youngest birds; the wing-coverts are mostly rufous-fulvous with dark brown tips and the lower parts often look as if fulvous broadly streaked with dark brown.

Distribution. All Europe and Northern Asia, Greenland, etc. A Winter visitor to India, extending to the Punjab, North-West Provinces and Sind. It breeds as far East and South as Mesopotamia and Persia.

Nidification. In Northern Europe the White-tailed Sea-Eagle breeds in April, sometimes in the end of March or early May. In South Europe it breeds in February and in Mesopotamia, North and Western Persia in January and February. The nest is a huge affair of sticks, branches and other rubbish, lined with grass, wool, etc. In North Europe it is nearly always placed on cliffs but elsewhere often in trees, sometimes on the ground and sometimes on ledges on clay banks of rivers. The eggs number one to three and are pure white, very rarely showing any pigmentation, though often much stained. One hundred eggs average 73·9 × 57·8 mm.: maxima **84·4** × 60·7 and 82·0 × **63·5** mm.; minima **66·0** × 54·0 and 68·0 × **53·0** mm. (*Witherby*).

Habits. This grand Eagle, magnificent as it is in its leisurely soaring flight is not nearly so fine a bird when at rest, sitting for hours on some rocky headland or high tree, hunched up and motionless until once more hunger urges it to action. It feeds largely on fish but also eats carrion and will kill and devour duck and sea-birds of all sorts and also hares, rabbits, etc. In Mesopotamia and Persia it keeps to the larger rivers, lagoons and to the sea-coast and is in some parts quite a common bird. It has not much pluck in spite of its size and power, and Buxton records a pair of Kites appropriating a completed nest of the Sea-Eagles without protest from them. The call is described by Witherby as "a querulous chatter, insignificant for so large a bird."

(1778) Haliaëtus leucogaster.

THE WHITE-BELLIED SEA-EAGLE.

Falco leucogaster Gmelin, Syst. Nat., i, p. 257 (1758) (New South Wales).
Haliaëtus leucogaster. Blanf. & Oates, iii, p. 368.

Vernacular names. *Kohassa* (Hind.); *Samp-mar* (in Orissa); *Ala* (Tam. and Tel.); *Loko-rajaliya* (Cing.); *Kadal-Ala* (Tam. in Ceylon); *Pa-kat* (Burma).

Description. Whole head and lower plumage pure white; upper plumage ashy-brown; primaries blackish-ashy; basal two-thirds of tail very dark ashy; terminal third white.

Colours of soft parts. Iris hazel-brown; bill dark leaden, the cere paler bluish-grey; legs and feet pale yellowish-white to greyish-white, claws darker; there are no lanceolate feathers on breast or hind neck and the legs are exceptionally powerful.

Measurements. Wing, ♂ 526 to 589 mm., ♀ 588 to 606 mm.; tail 208 to 260 mm.; tarsus about 92 to 99 mm.; culmen 48 to 55 mm.

Young birds are very dark brown above, the edges of the feathers fulvous and those of the head and neck mostly of this colour; wing-coverts much barred with fulvous; tail white, the sub-tip dark brown and also mottled with brown towards the end; chin and throat pale fulvous; lower parts fulvous, fulvous-brown, rufous-fulvous, varying much in depth of colour. It is interesting to note that young birds have the feathers of the hind-neck and breast distinctly lengthened and pointed.

Distribution. Coasts of India, Ceylon and Burma, from about the latitude of Bombay to the Malay Peninsula and through the Malay Archipelago to Australia, Tasmania and Western Polynesia. It ascends the great tidal rivers of Eastern Bengal as far as the districts of Mymensingh, Dacca and Noakhali and I procured one specimen on the Megna in Sylhet. It has also been recorded from Chota Nagpore, probably a storm-pressed individual only.

Nidification. This Sea-Eagle breeds in numbers along the Malabar coast to the extreme South and in lesser numbers over the whole of the rest of its range. They make their nests as a rule in trees on the very edge of the coast, both in the wildest parts and in among villages and cultivation. The nests are very large and are often made of sticks and branches of considerable size. A nest seen by De Roëpstorff in the Nicobars was more than nine feet across and many nests are five or six feet deep. The number of eggs is invariably two and these are pure white, coarse-grained and with an inner membrane of very deep green. Twenty-two eggs average 72·2 × 53·8 mm.: maxima **74·8** × 53·5 and 73·0 × **58·0** mm.; minima **65·1** × 51·0 and 69·0 × **50·0** mm. The normal breeding-time is from December to March but in Burma October and November seem to be the months for eggs, whilst Bulkley took an egg on the Malabar coast in August, possibly a second laying. The same nest is used year after year, merely patched and mended with a few more sticks when necessary.

Habits. The White-bellied Sea-Eagle is entirely a coastal bird, though it may follow the great tidal rivers some distance from their mouths. Nor does it wander far from its breeding-haunts, fishing in the close vicinity of its nest and often using this as a storeroom or larder after the young are hatched. When building away from human habitations it is said to be very wary and shy but when, as is often the case, its nest-tree is surrounded by huts and markets the birds take no notice at all of human beings. Their main diet is fish and this is mixed with snakes, lizards and frogs. Occasionally they will kill domestic fowls and other birds, though this is rare, whilst any carrion lying about is not despised. Their call is a very loud clanging cry of many notes, audible at a great distance, especially in the mornings and evenings when they are most noisy.

(1779) Haliaëtus leucoryphus.

PALLAS'S FISHING-EAGLE.

Aquila leucorypha Pall., Reise Russ. Reich., i, p. 454 (1771) (Lower Ural River).
Haliaëtus leucoryphus. Blanf. & Oates, iii, p. 366.

Vernacular names. *Macharang, Machmanga, Dhenk, Patrás* (Hind.); *Koral, Mach-koral, Bala* (Beng.); *Kankam* (Nepal); *Kokna, Ugus* (Kol.).

Description. Forehead and lores dull white passing into fulvous on the crown, nape, hind neck and interscapulars and thence into dark brown on the lower back, rump and upper tail-coverts; tail blackish-brown with a broad band of white across the centre;

wings dark rich brown, faintly glossed with purple-brown when newly moulted; the first few primaries almost black; chin, throat and fore-neck dirty whitish or fulvous-white, passing into fulvous on the lanceolate feathers of the upper breast and then into brown elsewhere below; the flanks, thigh-coverts and under tail-coverts a still darker brown.

Colours of soft parts. Iris greyish-yellow to yellow; bill dark slaty-black or plumbeous, the cere and gape paler; legs and feet dull white, yellowish-white or dull yellow, claws black.

Measurements. ♂, wing 555 to 578 mm.; tail 271 to 275 mm.; tarsus about 100 to 103 mm.; culmen 50 to 55 mm. ♀, wing 558 to 598 mm.; tail 274 to 291 mm.; tarsus 98 to 106 mm.; culmen 59 to 62 mm.

Young birds are all brown above, almost every feather fringed paler and the secondaries with a good deal of white on the inner webs; tail-feathers dark brown, in many specimens more or less mottled with white at the bases; chin and throat fulvous with darker centres, remaining lower plumage pale brown, the bases darker, the tips of the feathers often paler.

Distribution. The Caspian and Black Seas, Persian Gulf, Northern India and Burma but not South India, South Burma or Ceylon.

Nidification. This Eagle breeds all over India and in the Western Himalayas, up to about 6,000 feet, from November to March, making a huge stick-nest high up in a large tree. Generally the tree is on the bank of one of the larger rivers, swamps or lakes, occasionally some distance away from water in a tree in or near some fishing village. The eggs number two to four and are pure white, the shape normally a broad oval and the texture very coarse but the actual surface fairly smooth. Forty eggs average 69·7 × 55·1 mm.: maxima **76·8 × 57·9** mm.: minima **64·3 × 52 3** mm.

Habits. As the White-bellied Sea-Eagle is mainly a salt-water fisher, so this bird is almost entirely a fresh-water fisher, but when it builds near fishing villages does not disdain offal whether of fish or animals and sometimes also steals chickens and ducks. Reptiles of all sorts are eaten regularly, especially the huge bull-frogs. It is a cowardly bird and never to my knowledge defends young or nest, though Hutton gives a graphic description of a most ferocious defence put up by a pair of these Eagles in defence of two young ones. They are noisy birds, constantly uttering their loud far-resounding call. They are very powerful birds on the wing and can carry great weights, having a grasp that will hold a ten-pound fish. With fish of this weight no attempt to rise to any height is made, the struggling prey being dragged along over the surface of the water to the nearest bank and eaten there. I have seen this Eagle seated on carcasses floating down a river and feeding thereon.

Genus ICHTHYOPHAGA*.

Ichthyophaga Less., L'Echo au Monde Savante, ser. ii, p. 7 (1843).

Type, *Falco ichthyaëtus* Horsf.

This genus, containing two species of Fishing-Eagles, is in some respects very close to *Pandion* but whilst the Osprey has no after-shaft to the feathers these birds have it just as the true Eagles have. The tarsus is very powerful, feathered on the upper third or half; the toes are equally powerful with enormous, strongly-curved claws, not grooved underneath; the tarsi and toes are scutellated above and in front as in *Haliaëtus* and also behind, reticulations extending down the sides; the soles of the feet are covered densely with little spicules, giving immense grasping power; the outer toe is reversible, though not to quite the same extent as in the Osprey; the wing is rounded, the fourth and fifth primaries longest and sub-equal; the first is shorter than the longer secondaries; tail moderate and slightly rounded.

Both species of the genus are confined to the Oriental region.

Key to Species.

A. All tail-feathers brown-tipped, white on the basal two-thirds..... *I. ichthyaëtus*, p. 114.
B. Central tail-feathers brown throughout.... *I. humilis*, p. 116.

Ichthyophaga ichthyaëtus.

Key to Subspecies.

A. Larger; wing 450 mm. or over ..... *I. i. ichthyaëtus*, p. 114.
B. Smaller; wing 440 mm. or under ..... *I. i. plumbiceps*, p. 116.

(1780) Ichthyophaga ichthyaëtus ichthyaëtus.

THE LARGE GREY-HEADED FISHING-EAGLE.

Falco ichthyaëtus Horsf., Trans. Linn. Soc., xiii, p. 136 (1821) (Java).
Polioaëtus ichthyaëtus. Blanf. & Oates, iii, p. 370 (part.).

Vernacular names. *Madhuya* (Hind.); *Machmoral* (Beng.); *Na-Daoling gadeba* (Cachari).

Description. Whole head and neck grey, tinged ashy, the shafts pale in old birds; crown darker and more brown except in the oldest birds; upper back brown, darkening on the wings, lower back, rump and upper tail-coverts; primaries still darker with a plum tinge on the upper aspect; tail white with a dark brown band across the terminal quarter, the extreme tip whitish;

* Riley has shown (Proc. U.S. Nat. Mus., vol. lxiv, p. 43; *ibid.*, Richmond, vol. xxvi, p. 492, 1903) that the proper name for this genus is *Ichthyophaga*, antedating Kaup's name *Polioaëtus* by four years.

breast and anterior flanks brown, lighter than the back and generally rather reddish, occasionally grey-brown; abdomen, posterior flanks, vent, thigh- and under tail-coverts white.

Colours of soft parts. Iris bright golden yellow, paler yellow in young birds, mottled with brown or all brown in quite young birds, blue-brown in nestlings; bill dark horny-brown, the base bluish-plumbeous; the cere brown; legs and feet china-white to dull pale yellowish-grey, claws black.

Measurements. Wing 450 (exceptional) to 515 mm.; tail 248 to 280 mm.; tarsus 92 to 100 mm.; culmen 47 to 54 mm.

Young birds have the chin, throat and sides of the head grey; the rest of the upper parts dark brown, the head and neck streaked with whitish, the upper parts edged with greyish or fulvous-white; the white of the tail heavily mottled with brown; bases of primaries mottled and barred with white; breast and flanks pale brown, broadly streaked with white and the white parts more or less freckled with light brown.

Distribution. All India except Sind and North-West of Delhi; Assam, Burma, Malay Peninsula and islands East to the Celebes, Java and the Philippines.

Nidification. This Eagle breeds November to February, whilst Bingham took eggs on the 3rd March on the Thoungyeen River in Lower Burma. It is a very common bird in Assam and in many parts of Burma, almost invariably building its nest, a huge structure of branches which it occupies year after year, on a tree directly on a river-bank. This may be quite a small stream or a big river. Sometimes there is no lining, sometimes one of grass and rubbish. In Bengal it not unusually breeds on trees near large tanks or swamps and Jerdon speaks of finding a colony of these birds in Rajmahal, near the Ganges. The eggs number two to four and are pure white, though nearly always much stained; in shape they are proportionately longer than those of the preceding species. Twenty eggs average 68·6 × 51·9 mm.: maxima **70·0** × 51·9 and 69·4 × **54·5** mm.; minima **59·8** × 50·6 and 66·3 × **50·0** mm. It seems to be a cowardly bird and seldom makes the slightest protest against the robbing of its nest.

Habits. This Eagle is one which seems to require woods as well as water and spends most of the day perched on some tree watching for fish, upon which it swoops with great speed and accuracy. In the rivers near the base of the hills Mahseer often bask by the edges and I have often seen this Eagle seize them. We once picked up one such fish of which the remains were over 12 lbs. This had evidently been seized from a pool with a shelving bank close by and thence dragged into the grass alongside. It will also eat carrion, reptiles and I have seen remains of jungle-fowl, squirrels and chickens near its nest. It has a very loud, deep call, which is not unmusical when heard in wilder country.

(1781) Ichthyophaga ichthyaëtus plumbiceps.

THE CEYLON GREY-HEADED FISHING-EAGLE.

Ichthyophaga ichthyaëtus plumbiceps Stuart Baker, Bull. B. O. C., xlvii, p. 150 (1927) (Ceylon).
Polioaëtus ichthyaëtus. Blanf. & Oates, iii, p. 379 (part.).

Vernacular names. *Wewa-Rajaliya, Lūl-mārā* (Cing.); *Ala* (Tam.).

Description. Similar, except in size, to the preceding bird, though perhaps, as Legge points out, rather less cinereous-brown above in most adult birds.

Colours of soft parts as in *P. i. ichthyaëtus.*

Measurements. Wing 420 to 435, once 445 mm.; tail 232 to 242 mm.; tarsus about 85 to 90 mm.; culmen about 46 mm.

Distribution. Ceylon only. Whether birds in South Travancore are of this or the preceding race there is at present no material to show.

Nidification. Legge says that this race breeds in December and that he found young six weeks old on the 4th January. Nest and site are similar to those of the last bird. The measurements of two eggs are given by Wait as 67·1 × 53·1 mm., but these may prove to be exceptionally big.

Habits. Those of the species.

Ichthyophaga humilis.

Key to Subspecies.

A. Wing under 400 mm. ..... *I. h. humilis*, p. 116.
B. Wing over 400 mm..... *I. h. plumbeus*, p. 117.

(1782) Ichthyophaga humilis humilis.

THE MALAYAN GREY-HEADED FISHING-EAGLE.

Falco humilis Mull. & Schleg., Verh. Nat. Gesch., Aves, p. 47 (1840) (Sumatra).
Polioaëtus humilis. Blanf. & Oates, iii, p. 371 (part.).

Vernacular names. None recorded.

Description. Very similar to the preceding bird. The head is often a purer grey, the crown less brown and the feathers above and below black-shafted; primaries always more or less mottled on the inner bases with white; central tail-feathers dark brown with pale tip and a broad blackish subterminal band; lateral tail-feathers mottled white and brown on the basal two-thirds or more; in very old birds the white almost disappears.

Colours of soft parts as in *I. ichthyaëtus.*

Measurements. Wing 354 to 397 mm.; tail 174 to 205 mm.; tarsus 66 to 73 mm.; culmen 38 to 43 mm.

Young birds differ from the adult much as the young of the Large Grey-headed Eagles do.

Distribution. Tenasserim, Malay Peninsula to Sumatra.

Nidification. In Tenasserim this Fishing-Eagle breeds from December to March, building a nest of sticks lined with green leaves similar to that of the preceding species. The only four eggs I have seen, two pairs, vary between 55·1 × 50·2 and 68·0 × 53·1 mm.

Habits. A forest-bird, keeping to the banks of rivers and feeding almost entirely on fish and reptiles. Like the preceding race it keeps to the hills and broken ground and is never found in the estuaries like the larger species.

(1783) Ichthyophaga humilis plumbeus.

THE HIMALAYAN GREY-HEADED FISHING-EAGLE.

Polioaëtus plumbeus Jerdon, Ibis, p. 336 (1871) (N.W. Himalayas).
Polioaëtus humilis. Blanf. & Oates, iii, p. 371 (part.).

Vernacular names. *Na-Daoling-kashiba* (Cachari).

Description. Similar to the preceding bird but larger.

Colours of soft parts as in *I. ichthyaëtus.*

Measurements. Wing 435 to 495 mm.; tail 223 to 248 mm.; tarsus 78 to 91 mm.; culmen 40 to 46 mm.

Distribution. Sub-Himalayas from Kuman and Kashmir to Eastern Assam and Upper Burma. In Winter it has occurred as far South as Lucknow and wanders into the plains below the hills.

Nidification. This Eagle breeds all along the Himalayas from the foot-hills a few hundred feet high up to 5,000 feet, nearly always placing its nest in high trees on river-banks. In Assam the nests were always on forest-trees and this is the rule elsewhere, but occasionally one may be seen on solitary trees standing in cultivation or grass-land and this seems not uncommon in Kashmir. The nests are quite typical of the genus and are resorted to for many successive years, being repaired and added to until they are of very great size. The breeding-season varies from January to April, March and April being the two chief egg-laying months. The eggs, two or three in number, only vary from those of *I. i. ichthyaëtus* in being smaller. Twenty average 64·6 × 20·1 mm.: maxima **70·6 × 53·0** mm.; minima **60·2 × 46·6** mm.

Habits. Except that this bird keeps almost entirely to the hills its habits are similar to those of the Large Grey-headed Fishing-Eagle. In Assam and Burma it is more definitely a forest-

bird. The haunts of the two eagles overlap and I have taken the nest of this Eagle on the Diyung River in North Cachar, two days' journey by boat below where I have taken nest and eggs of its larger cousin. This Eagle is sometimes extremely noisy on moonlight nights during the breeding-season.

Genus HALIASTUR.

Haliastur Selby, Cat. Gen. et Subgen. Typ., p. 3 (1840).

Type, *Falco indus* Bodd.

The genus *Haliastur* leads from the Sea-Eagles to the Kites, being nearer the latter than the former. The bill is fairly large, compressed, slightly curved at the base and sharply so at the tip; festoon small but distinct; nostril almost round and oblique; wings very long, extending to or beyond the tip of the tail; fourth primary longest, first about equal to two-thirds length of fourth; tail rather long and slightly rounded; tarsi short and feathered above; the naked portion scutellated in front and on the toes, elsewhere with hexagonal scales, small at the sides, large behind, where in young birds they form broad scutæ; soles furnished with tiny prickly scales; outer toe longer than inner; claws curved and moderately strong.

The genus contains one species, which is found throughout the Oriental and Australian regions.

Haliastur indus.

Key to Subspecies.

A. Streaks on head and breast well defined. *H. i. indus*, p. 118.
B. Streaks on head and neck very narrow and less distinct ..... *H. i. intermedius* *, p. 120.

(1784) Haliastur indus indus.

THE BRAHMINY KITE.

Falco indus Bodd., Tabl. En., p. 25 (1783) (Pondicherry).
Haliastur indus. Blanf. & Oates, iii, p. 373.

Vernacular names. *Brahmini Chīl, Sankar Chīl, Dhobia-chīl, Ru-mubarik* (Hind.); *Khemankari* (Sansc.); *Garuda* (Can.); *Garuda-lawa, Garuda mantaru* (Tel.); *Clem Prandu* (Tam.); *Shemberrid* (Yerkli); *Pis Gonda* (Gond.); *Zoon-koun-byoo* (Burm.); *Ranga chilani* (Assam).

* Birds from the South of Tenasserim approach this race from Java but are generally nearer true *indus*; some individuals, however, from Tenasserim are almost indistinguishable from Sumatra birds.

Description. Whole head, neck, extreme upper back, breast and upper abdomen white, with distinct dark brown or blackish shaft-streaks; primaries black, the inner web chestnut on the base of the outer primaries below the notch, gradually increasing until the secondaries are all of this colour; tail tipped paler and with the under aspect pale greyish-chestnut; remainder of plumage chestnut, the feathers sometimes dark-shafted, more distinctly so on the interscapulars, innermost secondaries and wing-coverts than elsewhere.

Colours of soft parts. Iris brown; bill bluish-horny; the culmen and tip paler and sometimes yellowish; cere yellow; legs and feet dull yellow, greyish-yellow or greenish-yellow.

Measurements. Wing 362 to 394 mm.; tail 188 to 207 mm.; tarsus 52 to 59 mm.; culmen 32 to 35 mm. Females average a little larger than males.

Young birds are brown above, the feathers pale-tipped and, mostly, with black shafts; head and neck paler with broad terminal streaks of fulvous; ear-coverts dark brown; chin and throat fulvous, lower parts rufous-brown broadly streaked with fulvous; centre of abdomen and under tail-coverts fulvous with black shafts.

In the intermediate plumage the head, neck and breast are pale brown tinged with rufous and with black shaft-lines; upper plumage brown, the feathers pale-edged; the bases of the secondaries and greater coverts mottled more or less with white.

Distribution. India, Burma and Ceylon, Indo-Chinese countries and South China. Birds from the whole of Tenasserim are certainly more lightly streaked in many cases than are Northern individuals. They are, however, for the most part, nearer to *indus* than to *intermedius* though the Southernmost birds must be referred to the latter.

Nidification. The Brahminy Kite breeds wherever found between December and April. In Assam, Bengal, Burma and South-West India January and February are the favourite months but in North-West India February and March. It places its nest in almost any kind of tree in any position, sometimes fifty feet up, sometimes not ten. The tree selected may be a single one growing in cultivation, or it may be one of a clump or in a fruit-grove, less often one in thin deciduous jungle. It is a very rough untidy affair, made principally of small sticks but mixed with these may be found grass, wood, skins, bits of cloth, human and other hair and or other rubbish obtainable from the neighbourhood of villages. Often the nest is placed in a tree in the middle of a fishing village and twice I have seen them placed on the roofs of houses. They lay two or three eggs in most districts but in Dacca I often found four. Normally they are small poorly-coloured replicas of Kites' eggs, often all white, sometimes with a few flecks, smudges or lines of light red, reddish-brown

or purple. A few eggs, however, perhaps one in fifty, are really handsome, with numerous deep patches and spots of red-brown or blood-red. One hundred eggs average 50·7 × 40·2 mm.: maxima **55·6** × 44·0 and 49·0 × **45·0** mm.; minima **46·9** × 42·3 and 53·0 × **37·6** mm.

Habits. The Brahminy Kite is one of those birds which prefers to live in the vicinity of towns and villages, more particularly those which are on big rivers or close to swamps and large tanks. It may there be seen lazily floating about in wide circles overhead, every now and then uttering its long rather melancholy squeal. When tired of flight it perches on a tree, post or ridge of a house, from which it pounces on any scrap of offal thrown away or any small reptile or large insect which passes. In every fishing village there are one or more pairs of these birds which live almost entirely on the offal of the fish thrown away or upon such fish as it can steal. It is a very bold bird in its thefts and will swoop down to clutch a small fish within a few feet of its lawful owner. It also fishes for itself and catches fish, water insects, prawns, etc., but its principal diet is crabs and frogs. It derives its name of Brahminy Kite from the fact that the Hindus consider it sacred to Vishnu.

(1785) Haliastur indus intermedius.

THE MALAY BRAHMINY KITE.

Haliastur intermedius Gurney, Ibis, 1865, p. 28 (Java).
Haliastur indus. Blanf. & Oates, iii, p. 373 (part.).

Vernacular names. *Zoon-kown-byoo* (Burmese).

Description. Similar to the preceding race but with the streaks on the head, neck and lower parts very much finer.

Colours of soft parts and **Measurements** as in *H. i. indus*.

Distribution. Java, through the Malay Peninsula to the South of Tenasserim, Siam.

Nidification. There is practically nothing on record about the breeding of this bird within our limits beyond Bingham's record of an unfinished nest in April, found on the Haundraw River. Hopwood and Mackenzie found nests and eggs in March and April exactly resembling those of the Indian bird.

Habits in every respect like those of the Indian Brahminy Kite.

Genus MILVUS.

Milvus Cuvier, Leç. Anat. Comp., i, tabl., Ois., 1800.

Type, *Falco regalis* Roux = *Falco milvus* Linn.

The genus *Milvus* contains the three Kites distinguished by their long forked tails. The bill is comparatively weak, the

culmen curved as in *Haliastur* and with similar cere and nostril; the wings are long and pointed, reaching to, or not quite to, the end of the tail; the third and fourth quills are longest, the first proportionately rather longer than in *Haliastur*; tarsus and toes as in *Haliastur* but not so strong; the middle claw is dilated on the inside.

The genus is represented throughout the Old World.

Kirke-Swann has divided our Indian birds into two species (Synopsis Accipitres, pp. 96–8, 1919), *Milvus migrans* and *Milvus lineatus* (*melanotis* auct.), but I can see no generic differentiation between these birds, nor do their breeding-ranges overlap.

Milvus migrans.

Key to Subspecies.

A. Head in adults whitish with black streaks.	*M. m. migrans*, p. 121.
B. Head in adults fulvous with black streaks.	
a. Smaller, wing 420 to 499 mm.; under wing-patch of white inconspicuous	*M. m. govinda*, p. 122.
b. Larger, wing 475 to 552 mm.; under wing-patch of white conspicuous.....	*M. m. lineatus*, p. 124.



Fig. 18.—Head of *M. m. govinda*. ¾

(1786) Milvus migrans migrans.

THE BLACK KITE.

Falco migrans Bodd., Tabl. Pl. Enl., p. 28 (1783) (France).
Milvus migrans. Blanf. & Oates, iii, p. 378.

Vernacular names. None recorded.

Description. Whole head and neck white or nearly so, with black shaft-streaks, narrow on the face and ear-coverts, broader elsewhere; upper plumage brown, the white head and brown back grading into one another; median wing-coverts paler; primaries and primary coverts black, the inner bases of the former faintly barred with mottled fulvous and white; inner primaries grading into the brown of the secondaries; tail brown above, sandy-brown

below, with indefinite bands of darker brown, obsolete in very old birds; breast brown, with dark shaft-streaks, bordered with whitish; lower breast and abdomen becoming more rufous-chestnut, with black streaks only; vent, thigh-coverts and under tail-coverts still brighter chestnut with finer shaft-stripes; axillaries and under wing-coverts rufous-brown with dark shafts and some of the greater coverts with chestnut tips.

Colours of soft parts. Iris brown; bill black; cere, gape and extreme base of lower mandible yellow or greenish-yellow; legs and feet pale yellow, greyish-yellow or, in young birds, greenish-yellow.

Measurements. Wing 433 to 469 mm.; tail 248 to 275 mm.; tarsus 51 to 61 mm.; culmen 34 to 36 mm. Females average larger than males.

Young birds have a white patch under the eye; the ear-coverts dark brown; upper plumage brown, darker than in the adult, the feathers of the head with broad pale fulvous streaks and the feathers elsewhere tipped or edged pale and black-shafted, below the plumage is brown with broad whitish or fulvous streaks, older birds having these more narrow and with black shafts; the tail is more strongly barred.

Distribution. Africa, South Europe, North to Finland, North Africa, Asia Minor, Central Asia to Afghanistan and Baluchistan, having been found within our limits in Quetta.

Nidification. This Kite breeds throughout its range, making a large stick-nest lined with all sorts of rubbish and placed generally on a high tree but in Africa sometimes on a cliff. The eggs are exactly like those described in full for the next race and vary in number from two to four, the latter number exceptional. Jourdain gives the average of 100 eggs (63, *Rey*) as 52·92 × 43·33 mm.: maxima **61·0** × 42·3 and 55·7 × **46·1** mm.; minima **47·0** × 39·8 and 53·5 × **39·5** mm. The breeding-season is April and May.

Habits. Similar to those of the next bird. In Europe this Kite seems to be a Summer migrant only, wintering in North Africa.

(1787) **Milvus migrans govinda.**

THE COMMON PARIAH KITE.

Milvus govinda Sykes, P. Z. S., 1832, p. 89 (Deccan); Blanf. & Oates, iii, p. 374.

Vernacular names. *Chîl* (Hind. & Beng.); *Il* (Chamba); *Malla gedda* (Tel.); *Paria prandu*, *Kalu prandu* (Tam.); *Genda* (Mhári); *Rajaliya* (Cing.); *Zoon* (Burm.); *Chilana*, *Muga-charani* (Assam).

Description. Differs from the Black Kite chiefly in having the head and neck fulvous-brown with dark shafts; the upper parts

are also a darker brown and the underparts much less rufous; the dark shaft-lines on the latter have pale lines on either side of them; the bases of the wing-quills are much more boldly barred with white.

In many specimens there is no chestnut or rufous tinge on the underparts.

Colours of soft parts as in the preceding bird.

Measurements. Wing, ♂ 420 to 475 mm., ♀ 432 to 499 mm.; tail 250 to 289 mm.; tarsus 49 to 58 mm.; culmen 32 to 36 mm.

Young birds are almost indistinguishable from those of *M. m. migrans* but have less pale streaking on the head.

Distribution. All India, Burma and Ceylon and, rarely, in the Malay Peninsula.

Nidification. In the plains this Kite commences to breed in the end of December and continues through January and February, but in the Himalayas, where they breed up to 7,000 feet, they lay principally in March and occasionally as late as April. They make an untidy nest, of which the main material is generally sticks but these are always much mixed with rubbish of all sorts and I have seen one nest composed entirely of a puggree, the hollow filled with grass, twigs and wool. The site selected is either one of the larger forks of a tree or a mass of branches but at Dacca they occasionally build on a ruined mosque and they have also been known to breed elsewhere on ruins and old forts. The eggs number two or three; one egg, however, is sometimes incubated, whilst four are rarely laid, though one year in Dacca I personally saw six clutches of four eggs each out of some two or three hundred nests inspected. The eggs vary greatly. Many are a dull dirty white, almost spotless, others have scanty markings of light reddish to dark red-brown, whilst some, again, are richly marked with large blotches of deep red-brown and are extremely handsome. Some of the unusual types are equally beautiful. Among these are eggs with a pale pink ground profusely blotched with deep chestnut, others white with pale lavender or pale pinky-red blotches, others with twisted lines and spots of blood-red or purple-brown. One hundred eggs average 52·7 × 42·7 mm.: maxima **56·0 × 44·3** mm.; minima **49·1** × 40·9 and 50·0 × **39·1** mm. The site selected for the nest is generally one near or in villages and towns and within easy reach of the garbage and offal which forms the birds' staple diet; at other times trees, either single or one of a clump, in cultivation are chosen and, less often still, trees in scrub-jungle on the extreme edges of thin deciduous forest.

Habits. The Pariah Kite is essentially a follower of human beings, whom they follow up the mountains and into all new clearances, etc. They are common now at Simla and at other hill-stations up to and beyond 7,000 feet but they only haunt the neighbourhood of habitations at these heights and are never

found trespassing in the forest-haunts of their cousin The Black-eared Kite. In addition to offal and town-leavings, the Kite will kill and eat any sickly small bird or mammal or, if very hungry, chickens and other small birds which are not sickly. They also eat frogs, small lizards and grasshoppers, etc., and will follow flights of locusts for many miles, gorging to repletion on these and then sitting silent and motionless on a tree until they can again raise a hunger. Their flight is powerful and graceful and much of their time is spent soaring and wheeling in company in the air. Their call is a loud, shrill yet rather fascinating squeal, a prolonged sound which the Indian name *chīl* is supposed to represent. They are cowardly birds, seldom attempting to protect eggs or young but are very willing to bully and steal from birds weaker than themselves.

(1788) Milvus migrans lineatus.

THE BLACK-EARED KITE OR LARGE INDIAN KITE.

Haliaëtus lineatus Gray in Hardw., Ill. Ind. Zool., i, p. 1 (1832) (China).
Milvus melanotis. Blanf. & Oates, iii, p. 377.

Vernacular names. As for the preceding bird.

Description. Similar to the Common Pariah Kite except in having much more white on the lower wing-coverts, making a conspicuous white wing-patch especially noticeable when on the wing; generally the colour below is less rich than in *M. m. govinda*, paler and with no rufous tinge.

Colours of soft parts as in the other races. The legs and feet are sometimes nearly white, the claws black as usual.

Measurements. Wing, ♂ 475 to 529 mm., ♀ 480 to 552 mm.; tail 288 to 345 mm.; tarsus 52 to 62 mm.; culmen 34 to 37 mm.

Young birds are like those of the other races but generally very boldly marked on a darker ground-colour of brown.

Distribution. Japan, North China, Mongolia to the Himalayas as far West as Ladak and Northern Kashmir. It breeds in the hills and mountains South of the Brahmapootra and possibly in the higher ranges of Burma and Indo-China.

Nidification. Very similar to that of the last bird except that in India it is more of a forest-breeder and less of a village-haunter. The nests are similar also and have almost as much rubbish used in their construction unless they are built at a considerable distance from human buildings. In Assam we found them breeding at low altitudes in the hills, sometimes at 2,000 or 3,000 feet but *always* in the wilder parts away from villages. The eggs number two or three and only vary from those of the Pariah Kite in being larger. One hundred average 57·3 × 45·2 mm.: maxima 61·4 × 45·1 and 61·0 × 47·5 mm.; minima 53·8 × 47·0

, and 54·1 × 41·0 mm. The breeding-season in Kashmir and Ladak is March and April, in Tibet April and early May, in Assam February and March and in China February to March. In this last country the bird is as familiar and village-haunting as is our Common Indian Kite in India and is said to breed both upon trees and rocks.

Habits. Differ in no way from those of the Pariah Kite except that it a is shier and wilder bird, is only found in the plains in Winter and does not breed below 7,000 feet, if as low, except in Assam. Like *Milvus govinda* it sometimes collects in immense numbers to roost, the squealing which then goes on being incredible. It also collects in vast flocks when following locusts and I have seen many thousands at such times in the Assam Hills, dozens being perched on almost every pine-tree within sight.

Genus **ELANUS**.

Elanus Sav., Syst. Ois. d'Egypte, p. 274 (1809).

Type, *Falco cæruleus* Desf.

The genus *Elanus* embraces a few species of rather small birds allied to the Kites and represented in America, Africa and Asia to Australia.

The bill is small, wide at the base and compressed at the end, the culmen sharply curved from the cere; the festoon is distinct; the nostrils oval and nearly horizontal, protected by long loral bristles; wings long and pointed, reaching beyond the tip of the tail; second quill longest.

Elanus cæruleus.

Falco cæruleus Desf., Hist. Acad. Roy. Paris, p. 503 (1789).

Type-locality: Algiers.

The African form is slightly darker than the Indian and has a blue-grey wash on the breast, seldom if ever seen on the latter.

(1789) Elanus cæruleus vociferus.

THE BLACK-WINGED KITE.

Falco vociferus Lath., Ind. Orn., i, p. 46 (1790) (India).
Elanus cæruleus. Blanf. & Oates, iii, p. 379.

Vernacular names. *Kapassi* (Hind.); *Masunwa* (Oude); *Chanwa* (Nepal); *Adavi Ramadasu* (Tel.); *Aryellur* (Yerkli); *Ukussa* (Cing.).

Description. Anterior lores and forehead white, shading into pearly ashy-grey on the crown, nape, back rump and upper tail-coverts; posterior lores and a line over the eye black; lesser and

median wing-coverts black; greater coverts more ashy-grey; primaries grey, becoming more and more brown inwardly and with brown tips; the inner secondaries like the greater coverts; central tail-feathers pale grey; outer feathers white, those next the central ones having the outer webs and tips more or less tinged grey; lower parts, sides of head and neck, axillaries and under wing-coverts white; in some specimens the breast and flanks are tinged with pale pearly-grey but never to the same extent as in the African form.

Colours of soft parts. Iris crimson; yellow or yellow-brown in the young; bill black; cere and gape pale light yellow; legs and feet deep yellow, claws black.



Fig. 19.—Head of *E. c. vociferus*. ½.

Measurements. Wing, ♂ 259 to 268 mm., ♀ 262 to 268 mm.; tail 116 to 119 mm.; tarsus 30 to 34 mm.; culmen 20 to 21 mm.

Young birds have the crown-feathers brown with broad white edges; the upper parts are more brown and the feathers are broadly edged with white; the wing-coverts, black and grey, are also edged with white; the feathers of the breast have narrow brown shaft-lines and are tinged with fulvous and grey at the sides; the tail-feathers and quills are tipped white.

Distribution. India, from the base of the Himalayas to Ceylon, where it is rare; Hume also obtained it in the Laccadives. It is found sparingly in the plains of Assam and in Burma from the extreme North to Northern Tenasserim but is common nowhere.

Nidification. The Black-winged Kite seems to have two breeding-seasons, one in the cold weather from December to early March and the other after the rains break from July to October. Eggs, however, have been taken in practically every month of the year. They breed wherever found in the plains and also in the Himalayas up to some 5,000 feet on the outer valleys and hills. The nest is made of sticks rather loosely and clumsily put together and not large for the size of the bird. Sometimes there is a good lining of roots and coarse grass, etc., sometimes none at all. They affect rather small trees for building-purposes, their nests seldom

being more than 30 feet from the ground and in many parts of India babool trees and tall thorn-bushes form favourite sites. The tree selected, large or small, is most often one in the open. The eggs number three to five and are decidedly handsome. The ground-colour varies from white to pale cream, yellowish-stone or buff but most of this is covered by bold blotches, smears and spots of deep red or red-brown. Some eggs appear a uniform brick-red, others show up the paler ground, setting off the bold markings, whilst many have a deep cap at the larger end. There is often one egg in a clutch very sparsely marked with deep red-brown or purple-black and Herbert proves that normally this is the last egg laid. One hundred eggs average 39·3 × 30·9 mm.: maxima 41·7 × 30·6 and 38·3 × 32·1 mm.; minima 35·9 × 30·1 and 41·2 × 29·0 mm.

Habits. This handsome little Kite prefers well-wooded country, mixed with cultivation and thin deciduous or bush jungle but it is also found in very bare, sparsely-treed places such as Cutch and Sind and it is common in Behar. It is not migratory but seems to make sudden irruptions into various places, then dying out again. It was extraordinarily common in Poona in 1877 to 1879, again in Gujarat 1902 to 1904, whilst in Behar it was specially numerous in 1899. It occurs still in all these places but in much smaller numbers. It is a rather slothful bird in the day-time, perching on trees, whence it descends on passing insects, but it is much more active in the mornings and evenings, when it works over plains and open country much like a Kestrel, hovering occasionally like that bird and pouncing on rats, mice and locusts, etc. It also feeds on crabs in the rice-fields and will carry off small birds which are wounded or ill. Its cry is a thin, high-pitched squeal, very seldom uttered.

Genus **CIRCUS.**

Circus Lacép., Mém. de l'Inst., iii, p. 506 (1806).

Type, *Falco cyaneus* Linn.

The genus *Circus* contains the well-marked group of Raptores known as Harriers. Their principal superficial character consists of a ruff of small closely-set feathers, conspicuous in some species, less distinct in others, which extends across the throat and up each side of the neck; the bill is weak and compressed, a small festoon present and the culmen curved from base to tip; the nostril is large, broadly oval and is overhung by the loral bristles; the wing is long and pointed, the third primary longest and the first about equal to the sixth or seventh; the tail is long and either square or very slightly rounded; the tarsi are long and slender, feathered next the thigh only; toes slender with sharp well-curved claws. The genus is found throughout the temperate and tropical world. Blanford's key cannot be improved on.

Key to Species.

A. Outer web of 2nd, 3rd and 4th quills *only*, notched.
  a. Tarsus over 69 mm. ..... *C. macrourus*, p. 128.
  b. Tarsus under 66 mm. ..... *C. pygargus*, p. 130.
B. Outer webs of 2nd to 5th quill notched.
  c. Bill from cere to tip under 29 mm.
    a'. Upper parts ashy..... *C. cyaneus*, ♂ ad., p. 131.
    b'. Upper parts to rump black .. *C. melanoleucus*, ♂ ad., p. 132.
    c'. Upper parts brown with paler edgings.
      a''. Upper tail-coverts pure white. *C. cyaneus*, ♀ ad., p. 131.
      b''. Upper tail-coverts not all white.
        a^3. Coverts along forearm white or buff..... *C. melanoleucus*, ♀ ad., p. 132.
        b^3. Coverts along forearm brown.
          a^4. Abdomen buff with dark stripes ..... *C. cyaneus*, juv., p. 131.
          b^4. Abdomen rufous-brown. *C. melanoleucus*, juv., p. 132.
  d. Bill from cere to tip over 29 mm.
    a'. Abdomen plain white, or buff with dark shaft-stripes .... *C. spilonotus*, p. 135.
    b'. Abdomen dark or rufous-brown or rufous with dark stripes.. *C. æruginosus*, p. 134.

(1790) Circus macrourus.

THE PALE HARRIER.

Accipiter macrourus S. G. Gmel., N. Comm. Acad. Petro., xv, p. 439 (1771) (Veronitz, Volga).
Circus macrurus. Blanf. & Oates, iii, p. 381.

Vernacular names. *Dastmal, Girgit Mor, Pattai* (Hind.); *Pandawa* (Beng.); *Tella chappa gedda, Pilli gedda* (Tel.); *Puna prandu* (Tam.); *Kurrulu-goya, Ukassa* (Cing.); *Dao-ling wah-lai* (Cachari).

Description.—Adult Male. Lores, forehead above the eye and sides of face white, the bristles black; upper surface ashy-grey, tinged with brown (except in very old birds) on the crown, back and wing-coverts; upper tail-coverts barred grey and white; central tail-feathers grey with faint indications of bars, the next two pairs edged grey and barred grey and mottled white, the others barred grey and white; ear-coverts ashy-grey; first primary silvery-grey; second grey on the outer, black on the inner web; thence gradually blacker up to the sixth, when they again gradually become more and more grey; all have more or less mottled white on the bases of the inner webs and all, when quite fresh, have white tips; chin, throat and upper breast pearl-grey, remainder of lower parts white.

Colours of soft parts. Iris yellow, brown in the young; bill black; cere greenish-yellow; legs and feet deep yellow, claws black.

Measurements. ♂, wing 332 to 360 mm.; tail 201 to 221 mm.; tarsus 66 to 70 mm.; culmen 22 to 25 mm. ♀, wing 363 to 386 mm.; tail 229 to 247 mm.; tarsus about 70 to 75 mm.; culmen 26 to 28 mm.

The notch on the first primary is almost concealed by the coverts.

Female. Above rather dark brown; the feathers of the crown, nape and hind-neck conspicuously edged with bright pale rufous; forehead and supercilium buffy-white or rufous; upper tail-coverts white spotted with rufous or rufous-brown; central tail-feathers banded dark brown and dark grey, outermost pair barred



Fig. 20.—Head of *C. macrourus*, ♀. ¾.

rufous-brown and rufescent white, intermediate feathers grading from the one to the other; wing-coverts generally edged with pale rufous; wing-quills brown with narrow dark bars, creamy-white at the bases of the inner webs with dark bars; feathers round and behind the eye dark brown; ruff of pale rufous feathers with dark centres; posterior ear-coverts dark rufous-brown; lower parts white to pale rufous, nearly always darker and more rufous on the breast, with broad streaks everywhere of rufous-brown; axillaries and under wing-coverts white, creamy-white or pale rufous with rufous markings.

Young birds have the feathers of the upper parts margined everywhere with pale rufous; the upper tail-coverts are pure white; the ruff is unstreaked and very distinct; the lower parts are rufous-buff or buff with faintly showing darker rufous shafts on breast and flanks.

Distribution. Breeding East Europe, Northern Africa and West and Central Asia to the Altai. In Winter it is found over the greater part of India and Burma. It occurs in Ceylon but in Burma has not occurred as far South as Tenasserim.

Nidification. This Harrier breeds in South-East Europe and Western Asia, making a nest on the ground consisting of a bed of leaves and grass in a natural hollow. The site selected is usually one on a dry open plain but Kuschel found them breeding at the edge of a swamp in South Russia. The eggs number four or five and in shape are broad obtuse ovals. Most eggs are white or very faintly marked but a few are marked with pale reddish, or with pale pinkish-grey or with both, the blotches fairly large and scattered over the whole surface of the egg. Seventy-eight eggs (*Jourdain & Rey*, 69) average 44·6 × 34·7 mm.: maxima 50·0 × 37·0 mm.; minima 40·1 × 35·0 and 43·2 × 33·6 mm. The breeding-season is April and May.

Habits. The Pale Harrier is a bird of the drier steppes and plains and even in India, where it is a Winter visitor only, is more partial to dry wastes than to wet cultivation, though I have seen it hawking over rice-fields and swamps.

(1791) Circus pygargus.

MONTAGU'S HARRIER.

Falco pygargus Linn., Syst. Nat., 10th ed. i, p. 89 (1758) (England).
Circus cinereaceus. Blanf. & Oates, iii, p. 383.

Vernacular names as for the preceding bird.

Description.—Adult Male. Similar to the Pale Harrier but a much darker grey without any brown tinge in old birds and with less in the younger males; the chin, throat and breast are rather dark blue-grey, this colour sometimes extending on to the abdomen, which, however, together with the flanks, vent, thigh- and under tail-coverts are white or very pale grey with rufous central streaks; the first five primaries are blackish with a grey tip but no white on the bases; remaining primaries grey like the secondaries with white edges to the tips.

Colours of soft parts. Iris yellow, browner yellow in the female and brown in the young of both sexes; bill black; cere greenish-yellow; legs and feet yellow.

Measurements. Wing 344 to 395 mm.; tail 213 to 241 mm.; tarsus about 55 to 65 mm.; culmen 23 to 25 mm. The sexes do not differ in size.

Female. Similar to that of the Pale Harrier but darker both above and below; the rufous edges to the feathers of the head and wing-coverts darker and the central dark streaks on the lower plumage broader and darker; on the upper tail-coverts the white is less in extent and is in regular bars; the ruff is less distinct.

Young birds are very like those of the Pale Harrier but are darker and more richly coloured and the ruff is very indistinct.

It is, however, easily distinguished at all ages by the notch on the outer web of the secondary primary being distant an inch or more from the coverts.

Distribution. The greater part of Europe, Northern Africa and Western Asia. In Winter it occurs throughout the Himalayas to Burma and China and to the foot-hills and adjacent plains. It also occurs, though rarely, as far South as the Northern Bombay Presidency, Central Provinces and Orissa.

Nidification. Montagu's Harrier breeds from the end of April to early May, making a bulky nest of grass, rushes and reeds, either in a bed of rushes or actually on the ground in or near a swamp. It also breeds in heather and its nest has been found in corn-fields and occasionally in waste plains. The eggs number four to six and are generally unspotted bluish-white, rarely faintly marked with blotches of light red, one clutch in a hundred perhaps being more heavily marked still.

Habits. This Harrier is a very common visitor to the extreme North of India in Winter, when it may be seen lazily floating on outspread wings or flapping slowly over the surfaces of open swamps, rice-fields, etc., keeping within a few feet of the surface and every now and then dropping down on to some large insect, mouse, frog or similar article of food. Small items it eats as it flies but a mouse or frog is carried to the top of the nearest bank or mound and there devoured at leisure. It sits nearly always on the ground and rarely perches on trees or even posts.

(1792) Circus cyaneus cyaneus.

THE HEN-HARRIER.

Falco cyaneus Linn., Syst. Nat., 12th ed. i, p. 126 (1766) (Near London).
Circus cyaneus. Blanf. & Oates, iii, p. 384.

Vernacular names. Not distinguished from the preceding two species.

Description.—Adult Male. Very similar to the two preceding species. There is always a nuchal spot of white feathers streaked with dark brown; the sides of the head, the chin, throat and breast are grey; rump pure pale grey, upper tail-coverts white; outer tail-feathers white, merely edged with grey and with slight signs of pale rufous-grey bars; the first six primaries are black and *the second to fifth primaries are notched on the outer web*, the notch on the second primary being wholly concealed by the coverts.

Colours of soft parts as in the preceding species. Young females have the iris brown.

Measurements. ♂, wing 341 to 357 mm.; tail 210 to 221 mm.; tarsus 69 to 74 mm.; culmen 23 to 25 mm. ♀, wing 375 to 392 mm.; tail 246 to 255 mm.; tarsus 71 to 78 mm.; culmen 27 to 29 mm.

Female. The rufous markings on the wing-coverts, especially the greater, are better-defined spots than in the species already dealt with; the upper tail-coverts are pure white; the nuchal spot very definite; the ruff of buff feathers well developed with dark streaks; the forehead and feathers round the eye are dull browny-white.

Young birds have the whole underparts buff, rufous-buff, or dull pale rufous broadly striated throughout with dark brown; the ruff is well developed, the feathers always streaked.

Distribution. Europe and Northern Asia, migrating in Winter to North Africa, India, Burma and South China.

Nidification. The Hen-Harrier breeds from the end of April to the first week in June, making a nest of grass and scrap of heather well beaten down and protected by heather or some other plant. It is sometimes well lined with hair, feathers or other soft materials but often with nothing but matted grass. It is generally placed in heather, sometimes in grass or reeds about swamps and sometimes in very exposed bare places on hill-sides. The eggs number four to six, rarely seven or eight, and are generally white with no markings. A few, however, are flecked with pale reddish and still fewer with deeper markings of the same. One hundred British eggs average 46·2 × 36·1 mm.: maxima **52·1** × 38·0 and 49·5 × **40·0** mm.; minima **40·0** × **32·0** mm.

Habits. Those of the genus. It arrives in Northern India about the end of October and leaves in March. I have seen this bird carry away dead and wounded Snipe, snatching them up within a few yards of the shooter.

(1793) Circus melanoleucus.

THE PIED HARRIER.

Falco melanoleucus Forst., Ind. Zool., p. 12 (1781) (Ceylon).
Circus melanoleucus. Blanf. & Oates, iii, p. 385.

Vernacular names. *Pahatai* (Hind.); *Ablak petaha* (Nepal); *Thane-kya* (Burmese).

Description. Whole head, neck, breast, back to rump, shorter scapulars, median wing-coverts and first six primaries black; a nuchal patch of the white bases to the feathers sometimes showing; longer scapulars grey with broad white edges; rump white or pale silvery grey with white tips; tail-coverts grey with white tips and bands; tail grey with whitish tips and white edges to the inner webs of the outer feathers; lesser wing-coverts white, more or less sullied grey and with a succeeding band of black feathers to the shoulder of the wing; remaining coverts and inner quills silver-grey, more or less suffused with brown; remaining underparts, axillaries and wing-coverts pure white.

Colours of soft parts. Iris golden-yellow; bill slaty-blue with black tip; cere dull or greenish yellow; legs orange-yellow, duller and paler yellow in females and young, which also have brownish-blue irides.

Measurements. ♂, wing 344 to 367 mm.; tail 197 to 217 mm.; tarsus 76 to 80 mm.; culmen 22 to 24 mm. ♀, wing 366 to 387 mm.; tail 211 to 240 mm.; tarsus 81 to 88 mm.; culmen 25 to 27 mm.

Female. Plumage generally as in the females of the other species. From *macrourus* and *pygargus* it can be separated by the presence of a notch on the fifth primary; the coverts along the forearm are white with rufous-brown centres; the median wing-coverts have grey or white spots and marks; greater coverts dusky grey with broad bands of dark brown; the feathers of the head and ruff are white or pale buff, the feathers with broad brown lanceolate centres; lower plumage white to pale fulvous or rufous, streaked with brown; upper tail-coverts white, marked with light brown.

Young birds are darker brown above with dark rufous edges to the feathers of the head and neck; the nuchal patch is almost invariably present in marked degree; the lower parts are dark brownish-rufous, with dark brown streaks on breast and flanks; the ruff is very well marked.

Distribution. Breeding in Eastern Siberia, Mongolia and Northern China; in Winter South to Eastern India, Burma, China, the Indo-Chinese countries to the Philippines, etc. In India it is very common in Assam and Eastern Bengal, spreading South to Ceylon and West to the North-West Provinces, where it is very rare. It does not occur in any part of Central and Western India. It is common throughout Burma, extending thence through the greater part of South China and the Malay Archipelago.

Nidification. The Pied Harrier breeds on the Amur in April and May, making its nest in reeds and grass at the edge of swamps or on the ground in desert country. So far as is known, the eggs are white or but faintly marked and number three to five. Twenty-eight eggs average 43·6 × 34·5 mm.: maxima **45·0** × 35·9 and 43·0 × **36·0** mm.; minima **40·5** × 34·0 and 40·6 × **32·0** mm. It is practically certain that odd pairs remain to breed in the N. Cachar Hills, as I frequently saw pairs of birds there during July and August when out Gour or buffalo shooting. The birds were nearly always hawking over a few wet rice-fields and small marshes in the centre of a vast plateau of grassland.

Habits. This and the Marsh-Harrier are the commonest of the Harriers all over Eastern Bengal, Assam and Burma from October to April, generally hunting in pairs over the wide stretches of rice-fields or the bigger swamps and grasslands. Flight, food, etc., is similar to that of the other Harriers, but large grasshoppers

seem to form their staple food though they will often carry off wounded small birds before the sportsman can retrieve them. Their call is a weak but rapid "*wek-wek-wek*," not often uttered.

(1794) Circus æruginosus æruginosus.

THE MARSH-HARRIER.

Falco æruginosus Linn., Syst. Nat., 10th ed. i, p. 91 (1758) (Sweden).
Circus æruginosus. Blanf. & Oates, iii, p. 387.

Vernacular names. *Kutar*, *Kulesir* (Hind.); *Mat-chil* (Beng.); *Safed-sira*, *Tika Bauri* (Beng. Mahom.); *Kurala geya* (Cin.); *Prandu* (Tam., Ceylon).

Description. Head and neck, breast and coverts along forearm buff, pale rufous or rufous-buff with dark brown central streaks; back and scapulars dark brown; upper tail-coverts white with rufous-grey bands and mottlings; tail silver-grey, tipped white and with white edges to the inner webs of the outer feathers, where also there are indications of rufous-brown bars; wing-coverts dark brown, with more or less rufous tips to the feathers; outer greater coverts brown with broad grey tips and edges; primary coverts and inner quills silver-grey; first six primaries blackish, mottled with white on the bases; second to fifth primary notched; abdomen, posterior flanks, vent and under tail-coverts pale to dark rufous, with darker central streaks, the colour of the breast and abdomen grading into one another; under wing-coverts white; axillaries like the breast.

Colours of soft parts. Iris golden-yellow, duller in females and brownish in the young; bill black; the base, gonys and cere yellow to dull greenish-yellow; legs and feet yellow to orange-yellow.

Measurements. ♂, wing 385 to 405 mm.; tail 234 to 245 mm.; tarsus 80 to 85 mm.; culmen 28 to 30 mm. ♀, wing 390 to 430 mm.; tail 238 to 258 mm.; tarsus 85 to 90 mm.; culmen 28 to 31 mm.

Female. Forehead to nape, chin, throat and sometimes upper breast buff, the crown lightly streaked with dark brown; remainder of plumage dark brown, the back and lesser wing-coverts generally having a little rufous streaking; the wing-coverts and quills nearly always have paler rufous tips and there are sometimes some fulvous patches and mottling on the lower breast.

Young birds are wholly brown but the nuchal patch always and the anterior crown generally are buffy-white to pale rufous, with some dark brown shaft-lines and streaks.

Distribution. Europe to Western Siberia, extending in Winter to the whole of India, Ceylon, Burma and the Malay Peninsula.

The North-African bird has been separated as *C. æ. harterti*. It has the upper tail-coverts pure white.

Nidification. The Marsh-Harrier breeds from March to May in the South and from April to early June in the Northern areas of its range. The nest is nearly always placed in, or alongside, marshes and swamps and is a bigger, better-put-together affair than most Harriers' nests, consisting of a mass of reeds and rushes well-lined with dry grass. The eggs number four to six and are nearly always unspotted white with a bluish tint when fresh. Marked eggs are very exceptional. One hundred and six eggs average 49·5 × 38·6 mm.: maxima **54·6** × 39·1 and 51·0 × **42·1** mm.; minima **45·0** × 37·3 and 46·3 × **35·6** mm.

Habits. The Marsh-Harrier is essentially a bird of water-logged lands but with this exception its habits are much the same as those of other Harriers. It is a bigger, more powerful bird than the others and accordingly sometimes tackles bigger prey and it has been known to carry away Teal when wounded. It is said to be a desperate egg-thief and to do immense mischief to colonies of breeding Terns, stealing both eggs and young. This Harrier has been suspected of breeding in India and eggs were brought to me by a Mikir said to be of this bird but there is no actual proof so far that it is more than a very early visitor in September and takes its departure very late.

(1795) Circus spilonotus.

THE EASTERN MARSH-HARRIER.

Circus spilonotus Kaup. in Jard. Con. Orn., p. 59 (1850) (Asia, Philippines); Blanf. & Oates, iii, p. 388.

Vernacular names. *Thane-kya* (Burmese).

Description. Crown and sides of head and neck and upper back white to pale buff broadly streaked with blackish-brown; back, scapulars and inner wing-coverts dark brown with white or rufous spots at the tips of both webs; rump brown, the broad white bases showing everywhere; upper tail-coverts white with pale grey bands following the contour of the feathers; tail-feathers silvery grey, tipped and mottled on the inner webs of the outer tail-feathers with white; first five primaries blackish with mottled white bases; sixth primary grey and blackish; remaining quills, greater and outer median coverts grey with paler tips and broad black subterminal patches; lower plumage white, broadly streaked on the throat and breast with blackish, immaculate or finely streaked elsewhere.

Colours of soft parts. Iris golden-yellow, bill deep slaty-black at the tip and yellowish at the base and gape; cere dull yellow; legs and feet pale yellow.

Measurements. ♂, wing 384 mm.; tail 224 mm.; tarsus 91 mm.; culmen 29 mm. ♀, wing 406 to 420 mm.; tail 244 to 256 mm.; tarsus 91 to 95 mm.; culmen 31 to 32 mm.

Female. Very like that of the Marsh-Harrier but with the feathers of the crown, nape, neck and upper back pale rufous or buff with broad streaks of dark brown; the scapulars and wing-coverts also have more or less rufous tips and edges; the upper tail-coverts are mixed rufous, grey and white; central tail-feathers dark brown with pale tips and lighter cross-bands, outer feathers with no bands, paler and mottled on the inner webs with fulvous or buff; below as in *C. æruginosus* but much more marked with fulvous or buff, the lower breast being nearly all buff; the chin and throat are buff with fine black shaft-lines.

Young birds are like those of the Marsh-Harrier but are more streaked above; the central tail-feathers have six dark bars and the outer tail-feathers are pale rufous with whitish tips and four pale brown bars, the darkest next the tip.

Distribution. Transbaikalia to Tibet and Western China. In Winter South to South China, the Indo-Chinese countries to the Philippines. I obtained several in Cachar, Hume saw it in Manipur and it has been obtained near Moulmein.

Nidification. The Eastern Marsh-Harrier breeds during May and June, making a nest similar to that of the Marsh-Harrier. It lays three to six eggs, the former number probably being incomplete. They are white so far as is known and twenty-eight average 48·7 × 37·2 mm.: maxima **60·0** × 38·5 and 55·0 × **41·0** mm.; minima **41·0** × 34·4 and 42·0 × **33·5** mm.

Habits. Similar to those of the preceding bird.

Genus **BUTEO.**

Buteo Cuv., Leç. Comp. Anat., i, Tabl. Ois., 1800.

Type, *Falco buteo* Linn.

The genus *Buteo* contains the Buzzards, which differ from the Eagles in their weaker bills and feet and also in having no true immature plumage beyond slight variations in the barring of the tail and underparts. At the same time individual variation is extreme and is difficult to work out, as neither age nor sex seem to have anything to do with it.

In this genus the bill is moderate or small, the culmen is curved from the cere, the commissure almost straight, the festoon obsolete; the nostrils are oval and oblique; the wings are long, the fourth primary a trifle the longest or about equal to the fifth and third; the first four quills are deeply notched on the inner web; the tail is rather long and slightly rounded at the end; the tarsus is long, partly feathered in front with broad transverse scutellæ behind; the toes are short with the inner toe much shorter than the outer.

This genus is found throughout the greater part of the world but does not extend further South-East than India, though North it is represented East to Japan.

The Himalayan Rough-legged Buzzard has been generally separated under the generic name *Archibuteo* and Kirke-Swann retains the American species under the name *Triorchis*. The only difference between *Buteo* and *Triorchis* consists in the amount of feathering on the legs and as this is only a question of degree it does not seem of generic value. I therefore unite *Buteo* and *Triorchis*. It should be noted that Kirke-Swann, though keeping his two genera separate, admits the so-called *Archibuteo hemitolophus* to be identical with *Buteo hemilasius*.

Key to Species—Adults.

A. Tail more brown than rufous, with four to twelve transverse bars, not always distinct.	
a. Tail with subterminal and seven other bars, the base and inner webs of the rectrices white; flanks dark brown....	*B. hemilasius*, p. 140.
. Tail with four or five nearly obsolete dark bars; flanks and thighs rufous ..	*B. burmanicus*, p. 143.
B. Tail more rufous than brown, the bars obsolete with the exception of the subterminal one.	
c. Tail bright rufous	*B. vulpinus*, p. 142.
d. Tail pale rufous.....	*B. rufinus*, p. 137.

Immature.

C. Tail uniform brown	*B. burmanicus*, p. 143.
D. Tail brown or ashy-brown with transverse bars.	
e. Thighs buff streaked with dark brown ..	*B. rufinus*, p. 137.
f. Thighs ashy-brown, spotted with white .	*B. hemilasius*, p. 140.
E. Tail rufous, mottled with dark brown . ..	*B. vulpinus*, p. 142.

It will be seen from the above key that I follow Kirke-Swann in considering both *Buteo burmanicus* and *Buteo vulpinus* should rank as full species.

(1796) Buteo rufinus rufinus.

THE LONG-LEGGED BUZZARD.

Falco rufinus Cretzschmar in Rüpp. Atlas, p. 40, pl. 27 (1826) (Astrakan).
Buteo ferox. Blanf. & Oates, iii, p. 390.

Vernacular names. *Chuhuma* (Hind.).

Description. Very variable; the following, however, represent those phases most often met with, individuals intermediate between these being also common. The second to the fifth primaries are notched on the outer webs, the notch on the second being small.

(1) Prevailing plumage dark brown, in a few cases almost blackish-brown; the feathers of the head more rufous with black shafts and more or less rufous edges; chin, throat and upper breast with the rufous edges broader, making these parts generally lighter; lores, feathers above and below the eye whitish with black bristles; primaries blackish, outwardly grey-brown at the base, white-shafted and with most of the inner webs from the notch to the base white, edged brown and mottled with the same; inner primaries brown with blackish tips and more or less barred with darker brown; tail pale brown or rufous brown, mottled with darker, tipped paler and with one broad penultimate band of dark brown; bars absent or obsolete.



Fig. 21.—Foot of *B. r. rufinus*. ½.

(2) Brown of upper plumage lighter, the feathers of the back and wing-coverts broadly edged with pale rufous and those of the head and neck more rufous than brown; below also, the plumage is much lighter and the rufous marks dominate the colour of chin, throat and breast, whilst the abdomen, vent, etc., instead of being deep chocolate-brown are dark rufous-brown, mottled and edged with rufous; the tail is pale rufous instead of pale brown; the markings on wings, tail and head are, of course, as in the darker form.

(3) A still paler form, the head and neck-feathers being edged with fulvous rather than rufous, whilst the edges to the feathers of the rest of the upper parts are wider and paler rufous and extend on to the rump and upper tail-coverts; the tail is pale rufous-white, the end being more rufous than the base; on the underparts the chin, throat and breast are pale fulvous with brown streaks; the abdomen, vent and thigh-coverts rufou mottled with brown; centre of abdomen and under tail-coverts pale fulvous.

(4) Equally pale but browner and less rufous, the markings being almost white and making the head and shoulders look very pale; the whole underparts white with light brown streaks

Colours of soft parts. Iris golden-brown or yellowish-brown; bill horny or brownish-slate, black at the tip, yellowish at the base of the lower mandible and gape; cere yellowish-green; legs and feet dingy or pale lemon-yellow.

Measurements. ♂, wing 415 to 431 mm.; tail 228 to 250 mm.; tarsus 56 to 62 mm.; culmen 32 to 34 mm. ♀, wing 428 to 458 mm.; tail 230 to 257 mm.; tarsus 60 to 77 mm.; culmen 230 to 257 mm.

Young birds. I can find no definite juvenile plumage in this Buzzard beyond the fact that young birds have numerous dark bars on the tail-feathers. Kirke-Swann's description of the juvenile plumage (Mon. B. of Prey, vi, p. 379) is merely a description of a phase and not one of any particular age. Possibly young birds are more heavily edged with pale rufous above but our Indian nestlings certainly do not show this though we have very dark brown youngsters taken from the nest and all intermediate forms to the very pale bird with white underparts.

Distribution. Breeds in Greece and the South Russian Steppes, through Asia Minor and Palestine, East to Central Asia as far South as the Himalayas, in Winter straggling to the Central Provinces and the Deccan, being common at that season in the North-West Provinces, Punjab and Oude. East it extends to Bhutan. It should be noted that the darkest phase, which is also the most common in the Himalayas, is not found outside India, so that it would appear that here we have a subspecies in the making, whilst probably the paler phases will eventually disappear altogether from India.

Nidification. The records of the nidification of the Indian Buzzards are so mixed that they are not easy to unravel. We certainly have three species breeding in India. The present one, *rufinus*, is not uncommon in the Western Himalayas; *hemilasius* (=*Archibuteo hemitolophus*) breeds in Tibet and possibly in other parts of the higher Himalayas. These are both big birds, whilst the third, *vulpinus*, which also breeds in the North-West of India, is a much smaller bird laying a much smaller egg.

The Long-legged Buzzard breeds within Indian limits from the Afghan and Baluchistan border to Kashmir and Garhwal and South to Nowshera, where eggs were obtained with the bird by Cock. Rattray took the nest in the Murree Hills (thought to be *desertorum*=*vulpinus* at the time) and Parker had one egg from a nest below Simla. The nest may be placed either on a tree or a rocky cliff and is made of sticks, lined with smaller twigs and any rubbish such as straw, scraps of cloth, wool, etc. The full clutch seems to be two or three in India, rarely four outside that country; in appearance they are like badly-marked Kites' eggs, but there is one type with a white ground, beautifully clouded with reddish-

brown and lavender-grey, which is very typical of Buzzards' eggs, the degree of clouding and blotching varying greatly. Twelve Indian eggs average 56·9 × 46·0 mm.: maxima 62·4 × 48·0 mm.; minima 52·1 × 41·4 and 53·8 × 40·5 mm.

The breeding-season seems to be April and May, but I have eggs taken in March at Kohat and one taken on the 1st of June by Buchanan in Kashmir. Theobald's eggs were probably mostly those of *vulpinus*.

Habits. The Long-legged Buzzard is a bird of open lands, both stony arid countries and grass- or flower-covered steppes and fields. It is a sluggish bird, slow and heavy in its movements and much given to squatting either on the ground or on some post, mound or tree. At the same time it can and does soar most gracefully and may often be seen wheeling in wide circles overhead. It feeds on frogs, snakes, lizards, mice, rats, small weakly birds and also on dead animals of all kinds. It has a long wailing cry and also a short rather weak note sounding like "kiew-kiew-kiew," which has been likened to a kitten mewing.

(1797) Buteo hemilasius.

THE UPLAND BUZZARD.

Buteo hemilasius Temm. & Schleg. in Siebold's Faun. Jap., Aves, p. 16 (1844), pl. vii. (1845) (Japan).
Buteo leucocephalus. Blanf. & Oates, iii, p. 392.
Archibuteo hemitolophus. Blanf. & Oates, iii, p. 395.

Vernacular names. None recorded.

Description. Whole head white, the feathers of the crown and nape streaked with dark brown, the streaks coalescing on the sinciput to form a brown patch; broad moustachial streak brown; upper parts and wings brown, the feathers with inconspicuous dark shafts; central tail-feathers brown, mottled along the centre with white and with two or three terminal darker bars; outermost primaries black with inner webs white below the inner notch; remaining primaries more and more white on the inner webs, the outer webs greyish at the base and both webs barred with dark brown near the tips; the upper tail-coverts usually have a few white spots; chin white, throat and fore-neck brown with white bases showing strongly; remaining underparts brown, the paler bases showing up more or less and the feathers also lightly fringed with rufous.

One or two specimens are even darker than the above and are dark chocolate-brown everywhere; the primaries show a little white on the inner webs whilst the tail is barred with a few grey bars on the bases of the central feathers, the grey mixed with white increasing on the outer feathers.

Outside India the most common form is much paler; the head is light brown, each feather being edged with whitish, the white

forming a conspicuous nuchal patch; the upper parts are light brown more or less marked with fulvous or pale rufous; the lower parts are fulvous-white, the upper breast, flanks and centre of the abdomen with broad splashes of brown; the thigh-coverts brown with pale bars.

The under plumage varies from this, as above described, to fulvous profusely marked everywhere with brown. In these birds the tails of the younger specimens are marked with about seven bars of dark brown on a mottled ground of pale brown and white.

Yet other Indian specimens have the upper back and scapulars marked with rich rufous, whilst on the underparts a rich rufous or rufous-buff takes the place of the usual white or pale buff. In one of these specimens there are eleven bars on the central tail-feathers.

Colours of soft parts. Iris buff to golden-yellow or white; bill bluish-horny or dusky horny, paler and more yellow at gape and on base of lower mandible; cere greenish-yellow; legs and feet wax-yellow, livid yellow or yellowish-grey, claws black.

Measurements. Wing 480 to 501 mm.; tail 255 to 282 mm.; tarsus 81 to 90 mm.; culmen 34 to 36 mm.

The feathering on the tarsus varies greatly; in the majority the feathering covers half, or rather more than half, the front of the tarsus; in a few it only covers the upper third, whilst in many birds it extends well on to the base of the toes. The Indian birds, on account of their very dark colour, would seem to form a separate race but there is one specimen from N.E. Chihli which is almost as dark as any Indian bird.

Distribution. Breeding Japan, South-East Siberia and Mongolia to Tibet, Nepal and the Himalayas to Murree, Kashmir and Kuman. Probably, if not certainly, also breeding throughout the mountains of North Central China. In Winter it is found in North China, Burma and North-West India.

Nidification. The Upland Buzzard certainly breeds in Tibet, whence I have received skins and eggs, and probably in Ladak and Northern Kashmir. In Tibet it makes its nest on ledges of cliffs, nest and eggs only differing from those of the preceding bird in being larger. Thirty-two eggs average 59·0 × 47·6 mm. but six Indian eggs average 60·4 × 46·8 mm: maxima **64·0** × 46·0 and 61·9 × **47·9** mm.; minima **53·5** × 43·5 and 58·6 × **42·6** mm. Seminoff took a large series of these eggs in the Amur in May and June whilst in Tibet a clutch of three eggs was taken on the 29th April and a second clutch of two from the same nest on the 24th June.

Habits. Typical of the genus. It is found up to some 15,000 feet in Tibet and breeds between 12,000 and 14,000 feet, so far as is known at present. It is a powerful bird and perhaps

mere energetic and bold than most Buzzards, feeding largely on hares, gerbills, etc., and is even said to tackle the Tibetan Sand-Grouse.

(1798) Buteo vulpinus*.

THE DESERT-BUZZARD.

Falco vulpinus Gloger, Das Abän. der Vög., p. 141 (1833) (Africa).
Buteo desertorum. Blanf. & Oates, iii, p. 393 (part.).

Vernacular names. *Dang-pang-ti-on, Pang-ti-ong-nok* (Lepcha).

Description. Above brown, the feathers edged rufous except on the rump and upper tail-coverts; the head more rufous; tail rufous with pale edge to the tip, the shafts of the feathers white, a dark subterminal band and generally one or two more bands showing on the outer tail-feathers; wing-coverts like the back; primaries blackish-brown, white below the notch on the inner webs, the inner primaries also showing blackish cross-bars on these parts; lower parts rufous, the chin paler and streaked with dark brown; the remaining underparts showing pale bars and spots except on the thigh-coverts, which are practically uniform.

Colours of soft parts. Iris yellow to hazel; bill dark lead-colour, lighter on the base and gape, cere yellow; legs and feet yellow. The feathering on the tarsus varies. Normally only the upper frontal third is covered, occasionally half. The naked portion is scutellated in front, rarely reticulated.

Measurements. ♂, wing 350 to 377 mm.; tail 180 to 191 mm.; tarsus 68 to 72 mm.; culmen 29 to 31 mm. ♀, wing 378 to 392 mm.; tail 182 to 201 mm.; tarsus 68 to 73 mm.; culmen 30 to 31 mm.

Younger birds have the lower parts whitish, very pale buff or creamy; the feathers of the chin to breast with black shafts and the whole much marked and barred irregularly with light rufous-brown; thighs normally all rufous-brown.

Some individuals are less rufous in general tone and have the tail much browner.

Distribution. Western Asia to the Western Himalayas; South-East Europe, Asia Minor and Palestine. In Winter South to Africa, Arabia and India and, casually, into Western Europe as far as the British Isles.

Nidification. It is probable that most of Theobald's Buzzards' eggs recorded in Hume's 'Nests and Eggs' are those of this bird. I have others taken by Buchanan on the North-West Frontier and by Ward in Kashmir. These all agree well

* See Kirke-Swann, 'A Monograph of the Birds of Prey,' part vi, p. 372, 1926. Here Swann shows that *vulpinus* is probably a good species and not a race of *Buteo buteo*—a conclusion with which I agree.

with one another as also with undoubted eggs from South Russia and Western Asia. Their small size, rather longer shape and generally poor colour are very striking. In India they build both on trees and cliffs, the nests and eggs being small replicas of those of the Long-legged Buzzard. Twenty eggs (omitting Theobald's) average 53·3 × 42·8 mm.: maxima **57·0 × 45·1** mm.; minima **48·3 × 43·8** and **53·0 × 39·2** mm. The breeding-season commences in March and ends in early June, being a month or more earlier in the South than in the North.

Habits. Those of the genus.

(1799) Buteo burmanicus.

THE JAPANESE DESERT-BUZZARD.

Buteo burmanicus Oates, Str. Feath., iii, p. 30 (1875) (Upper Burma).
Buteo desertorum. Blanf. & Oates, iii, p. 393 (part.).

Vernacular names. As in *B. vulpinus*.

Description. Above dark brown, the feathers edged with rufous or buff; sides of head and neck rufous or buff with black streaks and a broad black or dark brown moustachial streak; lores white with black bristles; tail dark brown, tipped paler and mottled rufescent and brown along the centre, the pale mottlings increasing on the outer tail-feathers; primaries blackish, edged grey and with the inner webs below the notch white, barred with dark brown; the white on the inner primaries changing to rufous; chin rufescent, streaked with blackish; throat, fore-neck and breast rufous or rufous-brown, the feathers sometimes edged with fulvous and nearly always black-shafted; lower breast and abdomen white barred with brown, in some specimens the brown occupying almost the whole of the abdomen; vent and under tail-coverts usually much less spotted with brown; thigh-coverts dark brown with a little white barring.

A dark phase, common in the Himalayas, is dark purple or chocolate-brown throughout; the head often with a little rufous edging to the feathers; ear-coverts rufous, lores and sides of forehead white; the tail-feathers are faintly barred and the quills are faintly barred and marked with white as in the normal specimens.

Colours of soft parts. Iris brown; bill slaty-brown to plumbeous-black; the base rather paler; cere yellow; legs and feet yellow, claws black. The feathering on the tarsus varies; in most birds it covers half, or rather more than half, the front but in some Himalayan specimens (= *plumipes*) it covers the entire tarsus to the base of the toes.

Measurements. ♂, wing 374 to 379 mm.; tail 198 to 209 mm.; tarsus 63 to 65 mm.; culmen 29 mm. ♀, wing 389 to 454 mm.; tail 225 to 248 mm.; tarsus 69 to 74 mm.; culmen 29 to 36 mm.

Young birds are paler brown above and the feathers have broader and paler buff or whitish edges and, in addition, are much barred and marked with white on the bases and inner webs; the lores, forehead and a supercilium are white or pale buff; lower plumage white, pale buff or rufous, the breast, flanks and sometimes the abdomen streaked with dark brown; the thigh-coverts are dark brown or rufous-brown, barred with whitish, buff or pale rufous; under tail-coverts pure white; tail paler and more rufous than in the adult and more mottled and barred with brown, the bars numbering as many as a dozen, the terminal six well-marked, the basal six broken and indistinct.

Distribution. Japan, Corea, China, Manchuria, Dauria, Turkestan and, possibly, the Northern Himalayas to Tibet and Ladak; in Winter South to India, Burma, Ceylon and rare in the Malay Peninsula.

Nidification. Two clutches of eggs, which I attribute to this Buzzard, were taken by Ruchbiel at Issikul on the 29th April and 28th May respectively. They measure on an average 57·1 × 46·2 mm.

Habits. The Eastern birds migrate in great flocks along the Chinese coast to South China and are then caught by the Chinese bird-catchers in large numbers; the more Western birds seem to migrate directly South to India, Burma and the Indo-Chinese countries. Its habits are much the same as those of other Buzzards but it is less restricted to open country and is sometimes found in the outskirts of forest and in well-wooded districts.

Genus **ASTUR**.

Astur Lacépede, Mém. de l'Inst., iii, p. 505 (1801).

Type, *Falco palumbarius* Linn. = *Astur gentilis* Linn.

The genus *Astur*, together with *Accipiter*, comprises the true Hawks as compared with the Falcons, Eagles, Buzzards, Harriers and Kites, which have longer and more pointed wings.

In this genus the bill is short and powerful, curving sharply from the cere and with a well-pronounced festoon; the nostril is large, oval and horizontal, not vertical; either the third, fourth or fifth primary is longest or they are sub-equal; tail long and rather graduated; tarsus about equal to tibia in length, long and stout, the toes powerful and the middle toe not greatly longer than the others; the tarsus is scutellated in front and behind, reticulated on the sides.

The Crested Goshawks were retained by Blanford in a separate genus, *Lophospizias*, but differ from *Astur* only in having a small crest. Even the common Goshawk, however, has the feathers of the nape rather long and semi-erectile and the difference does not appear to me to be of generic value.

Key to Species.

A. No definite crest.	
a. Fourth quill longest.	
a'. Wing over 270 mm.	*A. gentilis*, p. 145.
b'. Wing under 240 mm.	*A. badius*, p. 147.
b. Third quill longest	*A. soloensis*, p. 153.
B. A small but distinct nuchal crest	*A. trivirgatus*, p. 153.

Astur gentilis.

Key to Subspecies.

A. Paler, upper parts more brown, less grey	*A. g. gentilis*, p. 145.
B. Darker, upper parts darker purer grey with little or no brown tinge	*A. g. schvedowi*, p. 146.

(1800) Astur gentilis gentilis.

THE GOSHAWK.

Falco gentilis Linn., Syst. Nat., 10th ed. i, p. 89 (1758) (Dalecarlian Alps).
Astur palumbarius. Blanf. & Oates, iii, p. 397 (part.).

Vernacular names. *Baz* ♀, *Jarra* ♂ (Hind.).

Description. Edge of forehead, lores and supercilium white streaked with blackish; crown, sides of head and neck and nape ashy-black, the last much mottled with white where the white bases of the dark feathers show through; upper plumage ashy-brown; quills browner, the under surface whiter and the inner webs mottled with white and barred with darker brown bars, obsolete on the inner secondaries; tail dark ashy-brown, the central feathers with dark patches in the middle and the outer feathers mottled with white and with dark brown bars on the inner webs; below pure white with narrow dark brown bars, the feathers of the chin, throat and breast dark-shafted.

Colours of soft parts. Iris golden-yellow; bill dark plumbeous-slate, paler at the base and often yellow on the gape; cere yellow, greenish above; legs and feet yellow, claws black.

Measurements. ♂, wing 305 to 330 mm.; tail 210 to 230 mm.; tarsus 70 to 78 mm.; culmen 21 to 24 mm. ♀, wing 340 to 375 mm. (*Witherby.*)

Young birds have the upper parts light brown, each feather edged with whitish; the crown, neck and sides of the head with broad white or pale buff edges, making these parts much paler than the back; tail pale mottled brown with four or five broad bands of dark brown, edged whitish; wing-quills more barred than in the adults, the bars extending also to the outer webs; below pale buff or pale rufous boldly streaked throughout with dark brown.

Distribution. Europe to Western Siberia, Asia Minor and Palestine. In Winter South to Northern Africa and into the North-Western Himalayas.

Nidification. In Europe the Goshawk builds its own nest high up on trees, adding to it every year so that it eventually becomes an immense affair. It is built entirely of sticks, some small and some very large and is lined and edged with smaller twigs. The eggs, two to four in number, rarely five, are white or bluish-white, very rarely faintly marked with blotches of pale reddish. One hundred eggs average 58·0 × 45·2 mm. (*Witherby*). The breeding-season is April and May but D. Meinertzhagen took fresh eggs as late as the middle of June in Finland.

Habits. The Goshawk is a bird of forests and well-wooded districts, of powerful flight and great courage. It feeds on hares, rabbits, squirrels, game-birds of all kinds, as well as on rats, mice and small birds. It watches for its game from a fixed perch, whence it launches forth on its prey. Its call is a loud squeal or scream and it also has a short quick note which Hartert syllabifies as "gyak, gyak, gyak."

(1801) Astur gentilis schvedowi.

THE EASTERN GOSHAWK.

Astur palumbarius schvedowi Menzb., Orn. Georg. Eur. Russ. in Mem., p. 439 (1882) (Transbaikalia).
Astur palumbarius. Blanf. & Oates, iii, p. 397 (part.).

Vernacular names. *Baz* ♀, *Jarra* ♂ (Hind.).

Description. Similar to the Common Goshawk but much darker, purer grey above, with very little or no tinge of brown except on the wing-quills.

Colours of soft parts as in the preceding bird.

Measurements. ♂, wing 290 to 323 mm.; ♀, 353 to 362 mm. A fine female obtained by La Touche in Chihli had a wing of 358 mm.

Young birds not distinguishable from those of *A. g. gentilis.*

Distribution. Northern and Central Asia from Transbaikalia to Japan, South to the Himalayas, the Tibetan plateau and the North-West Chinese ranges. In Winter Northern India, Burma and China.

Nidification. The Eastern Goshawk breeds from Japan to the Western Himalayas. Thompson told Hume "that they breed from March to June, building on trees a large circular nest of coarse twigs in which they lay three or four nearly pure white eggs. They confine themselves peculiarly to the interior of the deep, precipitous, woody valleys, lying close to the snowy peaks." Whymper found a nest with young during the end of March in

the Garhwal hills, curiously enough, at an elevation of under 3,000 feet. The female Goshawk attacked a man most bravely who was sent up to look into the nest and was with great difficulty kept away, nearly knocking him out of the tree in one of her dashes. Two eggs brought to Hume by a native but believed to be authentic measure 55·9 × 45·3 and 55·3 × 43·1 mm. This Hawk breeds in Assam, as I once had a young one brought to me said to have been caught at 7,000 feet but we never found a nest.

Habits. Those of the species. In India they seem to feed much on various kinds of pheasants and pigeons.

Astur badius.

Key to Subspecies.

A. Tail of adult with more than one dark subterminal band and of the young with more than three cross-bands of dark hues.
  a. Underparts less richly barred with rufous; rufous nuchal collar well marked.
    a'. Darker above.
      a''. Generally smaller, more grey above ..... *A. b. badius*, p. 147.
      b''. Generally larger, more ashy above *A. b. dussumieri*, p. 149.
    b'. Paler above ..... *A. b. cenchroides*, p. 150.
  b. Underparts very richly barred with rufous ..... *A. b. poliopsis*, p. 151.

B. Tail of adult with no bars except the subterminal band; young with only three bands.
  c. Irides yellow; smaller, wing under 190 mm. ..... *A. b. butleri*, p. 151.
  d. Irides crimson; larger, wing over 190 mm. ..... *A. b. obsoletus*, p. 152.

(1802) Astur badius badius.

THE CEYLON SHIKRA.

Falco badius Gmelin, Syst. Nat., i, p. 280 (1788) (Ceylon).
Astur badius. Blanf. & Oates, iii, p. 398 (part.).

Vernacular names. *Jali Dega* (Tel.); *Chinnur wallur* (Tam.); *Ukussa*, *Karula goya* (Cing.).

Description. Upper plumage grey, very lightly tinged with ashy; a well-defined rufescent-brownish collar on the hind-neck and sides of the neck; primaries darker grey, blackish at the tips, white on the inner webs below the notch and barred with dark brown or blackish; inner quills more grey and edged with white;

tail ashy-grey, the median and outermost feathers obsoletely, the others broadly barred with five bands of dark brown or black; lores white; sides of the head vinous-grey, chin and throat white with a well-defined mesial streak pale to dark grey; lower parts white, the breast, flanks and anterior abdomen with numerous narrow bars of rufous, varying much in depth of colour; in some specimens a few bars extend to the thigh-coverts but in this race most birds are pure white on these parts, the vent, lower abdomen and under tail-coverts.

Colours of soft parts. Iris golden-yellow; bill slaty-blue, black at the tip, paler at the base, yellowish on the gape; cere bright yellow to deep orange; legs and feet yellow, claws black.

Measurements. Wing, ♂ 169 to 180 mm., ♀ 195 to 207 mm.; tail 129 to 159 mm.; tarsus 44 to 53 mm.; culmen, ♂ 16 to 17 mm., ♀ 18 to 20 mm.

Fully adult females are like the male but take longer to assume this plumage, whilst younger birds have the upper parts more tinged with ashy.



Fig. 22.—Head of *A. b. badius*. ½.

Young birds are dark brown above, the feathers edged with rufous, more broadly so on the head and neck; the white bases of the neck-feathers often show through strongly; scapulars and innermost secondaries with broad white bases; outermost tail-feathers with seven narrow dark bars, other feathers with five broader bars; underparts white, with broad streaks of dark brown, becoming spots on the thigh-coverts and abdomen.

Distribution. Ceylon and Travancore.

Nidification. I can find nothing on record about the nidification of this form of the Shikra beyond Legge's statement that it breeds in May and June in the interior of forests. Phillips obtained three eggs from a nest built in a rubber-tree on the 2nd April, whilst Bourdillon and Stewart took eggs in February, March and May. The nest, self-built, is made of twigs and small sticks, high up in a big tree, measuring a foot or less in diameter and only three or four inches deep. The eggs, two to four in number,

are a pale skim-milk blue, fading to white in time. Sixteen average 39·0 × 31·2 mm.: maxima 43·6 × 32·0 and 42·8 × 35·0 mm.; minima 37·4 × 29·3 mm. The parent birds are sometimes very resolute in defence of their young, whilst at other times they display no interest in them.

Habits. According to Legge this is a bird of the forest, retiring to their depths for breeding-purposes. Bourdillon, however, says it is a bird of the open or of the lightest forest only and Phillips and Stewart both found it breeding in the rubber-lands and open country. It feeds principally on frogs and lizards, but also eats mice, rats, locusts, termites and any kind of large insect, swooping down on these from an elevated perch, sometimes following up its prey and hunting it down but never falling headlong on to it like the Falcons. Its note is a shrill double whistle.

(1803) Astur badius dussumieri.

THE INDIAN SHIKRA.

Falco dussumieri Temm., Pl. Col., livr. 52, pl. 308 (1824) (Bengal)
Astur badius. Blanf. & Oates, iii, p. 398 (part.).

Vernacular names. *Shikra* ♀, *Chipka* or *Chippak* ♂ (Hind.); *Kathia* ♂, *Tunna* ♀ (Nepal), *Ting-kyi* (Lepcha); *U-cham* (Bhut.).

Description. Similar to the typical form but rather larger, a trifle paler and distinctly more ashy, less grey above; on an average, also, the barring underneath is paler.

Colours of soft parts as in the typical form.

Measurements. Wing, ♂ 177 to 190 mm., ♀ 201 to 220 mm.; culmen, ♀, 20 to 22 mm.

Distribution. The whole of India, except Travancore, from Kashmir and the North-West Frontier to Sikkim and Bengal. In the extreme North-West and Sind its place is taken by the next bird.

Nidification. The Shikra breeds in Southern India in March and April and in Northern India in April and May. The nest is usually placed high up on trees either quite in the open or, preferably, in orchards or groves and it is the exception to find nests even in thin forest. They are small for Hawks' nests, loosely put together, seldom lined and stand but little handling. Mango-trees in clumps form very favourite sites, the nests being high up in stoutish forks. The eggs number three or, less often, four, whilst two are sometimes incubated and Anderson once took five. In colour they are the palest skim-milk blue possible but fade quickly to almost pure white. Every now and then an egg

may be seen with a few black specks or with faint reddish blotches. Sixty eggs average 38·5 × 31·2 mm.: maxima 42·6 × 31·6 and 41·3 × 33·0 mm.; minima 36·1 × 29·2 mm.

Habits. The Indian Shikra dislikes deep forest or the driest deserts, preferring open country, cultivation, grassland, or scrub with groves of trees and mango-orchards. It has no fear of humanity and in many places, as in Bihar, it is most common round villages and often enters gardens. Its flight is powerful and it is a most plucky little hawk, often used for falconry, being thrown from the hand at quails and other small game-birds, whilst some are trained almost exclusively to hunt crows. I have also known it used to hunt pond-herons. Its food and voice is the same as that of the preceding bird.

(1804) Astur badius cenchroides.

SEVERTZOF'S OR THE SIND SHIKRA.

Astur cenchroides Severtzof, Turkestan Jevotn., p. 63 (1873) (Turkestan).
Astur badius. Blanf. & Oates, iii, p. 398 (part.).

Vernacular names. *Shikra* ♂, *Chipka* ♀ (Hind.).

Description. Decidedly larger and paler in every stage of plumage. In the fully adult the plumage is more brown, less grey than in either of the two preceding races; the barring below is sometimes rather paler and almost invariably extends on to the vent and thigh-coverts.

Colours of soft parts as in the preceding races.

Measurements. Wing, ♂ 177 to 196, nearly always over 185 mm., ♀ 209 to 221 mm.

Distribution. Turkestan, Baluchistan, Afghanistan, Eastern Persia, Sind and extreme North-West Frontier Provinces; in Winter extending into the Punjab.

Nidification. The Sind Shikra breeds in March and April, making its nest, according to Ticehurst, on trees in "thickish jungle" but according to Bulkley and others mostly in groves and sometimes on single trees. Nests and eggs are like those of the other races. Sixteen eggs average 39·0 × 30·2 mm.: maxima 41·2 × 31·2 and 40·7 × 31·3 mm.: minima 36·8 × 29·5 and 38·1 × 29·1 mm.

Habits. Those of the genus, except that it is found in hotter, drier areas. Even in Sind, however, this Shikra seems to keep to the better-watered areas of canal, river or swamp, where there are ample trees for nesting and roosting purposes.

(1805) Astur badius poliopsis.

HUME'S OR THE BURMESE SHIKRA.

Micronisus poliopsis Hume, Str. Feath., ii. p. 325 (1874) (Thayetmyo).
Astur badius. Blanf. & Oates, iii, p. 398 (part.).

Vernacular names. *Shikra-sorai* (Assam); *Thane* (Burm.).

Description. Rather larger than true *A. b. badius* but equally dark except on the head, which is a purer grey; the sides of the head are concolorous with the crown instead of being tinged with brown or ashy as in both the Ceylon and Northern Indian Shikra; the underparts are much more richly marked with rufous than in any other race; the tail seems proportionately rather longer and has only four dark bands on the lateral feathers (not including the outermost) instead of five or six.

Colours of soft parts as in other races.

Measurements. Wing, ♂ 186 to 203 mm., ♀ 221 to 226 mm.; culmen, ♂ 19 to 21 mm., ♀ 20 to 22 mm.

Distribution. Assam; Burma, South to Tenasserim; Siam and the Indo-Chinese countries to Formosa *.

Nidification. Similar to that of the other races but the nest is often built on trees in quite thick forest. The few specimens I have seen were fiercely defended by both parents, who repeatedly stooped within a few inches of the man climbing the tree. Twenty eggs average 39·0 × 31·8 mm.: maxima **41·0** × 31·0 and 40·0 × **32·1** mm.; minima **36·9** × 30·0 and 38·2 × **28·4** mm. The breeding-season in Assam is April and May; in Burma March and April.

Habits. Those of the species except that this race is found more often in the interior of forests as well as in the open and round about villages.

(1806) Astur badius butleri.

THE CAR NICOBAR SHIKRA.

Astur butleri Gurney, Bull. B. O. C., vii, p. 27 (1898) (Car Nicobars); Blanf. & Oates, iv, Appen., p. 486.

Vernacular names. None recorded.

Description. A small very richly-coloured form of *A. badius* with only one subterminal bar on the tail in adult birds and only three or four bars on the tail in the young ones; the under wing-coverts and wing-quills are unbarred, the coverts pure white.

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* Kirke-Swann separates the Shikras from Siam and the Indo-Chinese countries as *A. b. klossi* on account of their somewhat smaller size (Mon. Accipitres, part iv, p. 217, 1925). My measurements do not endorse this.

In the young bird the feathers are more broadly edged with deeper rufous, making these parts much more rich in colour than in any of the preceding races.

Female. The bird obtained with the type male is much more rufous everywhere than any specimen of any other *Astur badius* in the British Museum. The upper parts are all rufous lightly marked with blackish: a patch of the same on the nape and two distinct and one obsolete black bar on the tail; the underparts are white marked profusely with rufous in streaks on the breast, changing to bars on the abdomen and to large drops on the thigh-coverts.

Colours of soft parts. Iris bright orange; feet yellow.

Young. Iris greyish-white; feet pale lemon; bill black, base bluish; cere pale green; eyelids greenish (*Gurney*).

Measurements. ♀, wing 180 mm.; tail 152 mm.; tarsus 43 mm.; culmen 29 mm. "Wing 173 mm.; tail 134 mm.; tarsus 48 mm." (*Gurney*). In the British Museum specimen (*juv.*) the fourth primary is longest.

Distribution. Car Nicobars. Dr. Abbott thought he saw this race in Camorta.

Nidification. Unknown.

Habits. Nothing recorded.

(1807) Astur badius obsoletus *.

THE KATCHAL SHIKRA.

Astur obsoletus Richmond, Proc. U.S. Nat. Mus., xxv, p. 306 (1902) (Katchal).

Vernacular names. None recorded.

Description. "Closely resembles *A. butleri* above but is paler on the nape and the sides of the head; it differs also in the indistinct white superciliary line and white lores and throat. Below it resembles *A. butleri* in pattern but with the reddish colour on breast almost entirely absent" (*Richmond*).

Colours of soft parts. "Iris dark crimson; feet yellow; bill blackish at tip, horn-blue at base; cere greenish; eyelids greenish" (*Abbott*).

Measurements. "Wing 192; tail 157 mm.; tarsus 52 mm.; culmen 21·5 mm.; length 330 mm." (*Abbott*). Two other females were bigger, wing 343 mm.

Distribution. Katchal.

Nidification and **Habits** unknown.

* Kirke-Swann considers *A. b. butleri* and *A. b. obsoletus* to be specifically distinct from *A. badius*. To me both appear to be merely island forms of *badius*, the characters differing only in degree from that species.

(1808) Astur soloensis.

HORSFIELD'S GOSHAWK.

Falco soloensis Horsf., Trans. Linn. Soc., xiii, p. 137 (1821) (Java).
Astur soloensis. Blanf. & Oates, iii, p. 400.

Vernacular names. None recorded.

Description. Upper plumage ashy-black, the feathers edged with black and the scapulars with large white central spots or patches; central tail-feathers immaculate, outer paler, faintly barred with blackish and tipped white; extreme bases of primaries pure white in the oldest birds, barred with dark brown in younger ones; sides of head and throat grey; lower surface white, the throat narrowly streaked with dark grey; breast tinged with vinous rufous in the oldest birds; the youngest birds with adult upper parts, have the whole breast, flanks and upper abdomen quite deep rufous, the vent, thighs and under tail-coverts almost white with faint rufous-brown bars; between the two extremes every stage of colour is to be seen.

Colours of soft parts. Iris pale yellow or straw-colour; bill horny-plumbeous, black-tipped and yellowish at gape; cere and eyelids light yellow; legs and feet orange-yellow.

Measurements. Wing 175 to 196 mm.; tail 120 to 139, once 147 mm.; tarsus about 39 to 44 mm.; culmen 17 to 19 mm.

Young birds are very like those of *Astur badius*; the chin, throat and breast are streaked with brown or rufous-brown, the streaks becoming bars on the abdomen, vent and thigh-coverts; under tail-coverts pale buff or white; the upper parts are rather darker than in *A. badius*.

Distribution. Southern China to New Guinea, the Indo-Chinese countries; the Malay Archipelago, Malay States, South Tenasserim and a straggler into Eastern Burma. Abbott and Kloss found it common in Katchal and on the Great and Little Nicobars.

Nidification. Unknown.

Habits. This seems to be more of a jungle-form than any of the other races during the Winter months, but in China it is sometimes seen in quite open country. Hume saw it in the densest forests in the Andamans and Bingham got it in teak-forest in Tenasserim. It feeds principally on frogs and lizards but certainly sometimes tackles birds of some size as it was seen pursuing a Golden Oriole.

Astur trivirgatus.

Key to Subspecies.

A. Smaller; wing, ♂ under 200 mm., ♀ under 250 mm. ..... *A. t. trivirgatus*, p. 154.
B. Larger; wing, ♂ over 210 mm., ♀ over 260 mm. ..... *A. t. rufitinctus*, p. 155.

(1809) Astur trivirgatus trivirgatus.

THE CRESTED GOSHAWK.

Falco trivirgatus Temm., Pl. Col., pl. 303 (1824) (Sumatra).
Lophospizias trivirgatus. Blanf. & Oates, iii, p. 401 (part.).

Vernacular names. *Gor Bezra, Manik Bezra, Kŏteswar* (Hind.); *Kokila'dega* (Tel.).

Description. Forehead, crown and nuchal crest blackish-grey, paler on the sides of the head and neck, the feathers with dark shafts; upper parts dark brown; the tail-coverts tipped with white; tail light brown, tipped with white and with one concealed and four exposed dark brown bars; wing-quills barred with dark brown, the inner webs white below the notch; chin, throat and breast white, a dark brown mesial streak from the angle of the chin to the breast; breast white with broad streaks of rich rufous brown; under tail-coverts pure white; remaining underparts barred white and dark rufous-brown.

Colours of soft parts. Iris golden-yellow; bill horny-brown or plumbeous-horny, the culmen and tip blackish, the gape yellowish; cere and eyelids greenish-yellow; legs and feet dull pale yellow to fairly bright dark yellow, claws blackish-horny.

Measurements. Wing 195 to 208, once 220 mm.; tail 151 to 173 mm.; tarsus about 51 to 57 mm.; culmen 21 to 26 mm.

Young birds are dark brown above, each feather edged with fulvous and with fulvous or rufous bases showing more or less everywhere; the hind-neck being fulvous with merely a few black spots; head-feathers very broadly edged with fulvous and a broad supercilium fulvous with a few black streaks; lower plumage buff or pale rufous, the throat and breast with broad spots of dark brown and the thighs more or less barred with the same colour.

Distribution. Ceylon and Travancore, North to Khandesh, Nilgiris and other hill-ranges of Mysore and Southern India; Malay Peninsula North to Tenasserim and East to the Philippines. Travancore and Ceylon birds are very small but Nilgiri, Wynaad and Bombay birds are larger and run up to a wing of 220 mm.

Nidification. The Crested Goshawk breeds in Southern Travancore in March and April, making a large nest of sticks and twigs, lined with green leaves and placed high up in some great tree in the interior of either evergreen or deciduous forests. The height is usually anything between forty and a hundred feet, but Stewart also found nests occasionally on saplings within about twenty feet from the ground. Preferably trees are selected for building-purposes near rivers or small ponds. In Kanara, Bell and Davidson found nests with eggs in April but in Ceylon its nest has not yet been taken. The eggs number two or three and are like large eggs of *Astur badius* but the texture is coarser; the usual shape is a broad oval, the smaller end hardly perceptible. Twenty eggs average 46·8 × 37·2 mm.: maxima **50·2 × 39·6** mm.; minima

43·2 × 36·4 and 45·9 × 36·2 mm. The hen bird sits close and sometimes attacks human marauders with fierceness but, at other times, slips off the nest with no demonstration at all.

Habits. This Goshawk is a purely forest bird and is found alike in the plains and up to 3,500 feet in Ceylon and perhaps higher than this in the Hills of Southern Indian. In Travancore it seems most common between 1,500 and 3,000 feet. It is a shy bird and difficult to watch or obtain, sitting much of its time on trees, high up and well-screened by foliage, where it can see and watch for its prey without being seen itself. It lives principally on frogs and lizards, varying these from time to time with small mammals and birds. Wait says its cry is a shrill note of one syllable.

(1810) Astur trivirgatus rufitinctus.

THE NORTHERN CRESTED GOSHAWK.

Spizaëtus rufitinctus McClell., P. Z. S., 1839, p. 153 (Assam).
Lophospizias trivirgatus. Blanf. & Oates, iii, p. 401 (part.).

Vernacular names. *Churiari, Jamal Kanthi, Jurye* (Nepal); *Hagrani Daoling* (Cachari).

Description. Differs from the preceding race only in its larger size.

Colours of soft parts as in the Southern Crested Goshawk.

Measurements. Wing, ♂ 224 to 237 mm., ♀ 228 to 267 mm.

Distribution. Northern India from Garhwal and Nepal to Eastern and Southern Assam; Northern and Central Burma through the Indo-Chinese countries to Formosa and Hainan.

Nidification. The Northern Crested Goshawk breeds from the middle of March to the middle of May from the foot-hills up to 6,000 feet, at which height its nest has been taken in the Naga Hills. Nest and eggs are indistinguishable from those of the previous bird though the latter are larger, twenty averaging 48·4 × 39·6 mm.: maxima **54·0** × 38·0 and 49·8 × **41·0** mm.; minima **45·0** × 39·7 and 54·0 × **38·0** mm. The nests I have personally taken have been savagely protected by both parent-birds and it has always been necessary to fire shots in the air to protect the climbers. The birds sometimes use the same nest several years in succession and will generally lay again if the first eggs are taken when fresh.

Habits. Similar to those of the preceding bird but this race feeds more on green pigeons, wood partridges and larger birds, even on jungle-fowl and pheasants. Its ordinary cry is a shrill prolonged yelp but it also makes a hoarse chuckling note and when attacking nest-thieves screams loudly and utters deep croaks as it swoops.

Genus ACCIPITER.

Accipiter Brisson, Orn., i, p. 310 (1760).

Type, *Falco nisus* Linn.

The genus *Accipiter* differs from *Astur* in having the tarsi and toes much more slender and longer and in having the middle toe greatly exceeding the lateral toes in length. It is true that in some species these distinctions are not so pronounced as in most but the separation of so great and widespread a group as the Goshawks and Sparrow-Hawks into two genera is both convenient and desirable and in so far as our Indian species are concerned the differences are obvious.

The genus is cosmopolitan and three species are found within our limits.

Key to Species.

A. Throat with no black mesial line ..... *A. nisus*, p. 156.
B. Throat with broad black mesial line ..... *A. virgatus*, p. 159.
C. Throat with narrow black mesial line ..... *A. gularis*, p. 162.

Accipiter nisus.

Falco nisus Linn., Syst. Nat., 16th ed. i, p. 92 (1758).

Type-locality: Sweden.

The English, or European, form of Sparrow-Hawk is darker than *A. n. nisosimilis* and not so dark as *A. n. melanoschistus*.

Key to Subspecies.

A. Much paler ..... *A. n. nisosimilis*, p. 156.
B. Much darker ..... *A. n. melanoschistus*, p. 158.

(1811) Accipiter nisus nisosimilis.

THE ASIATIC SPARROW-HAWK.

Falco nisosimilis Tickell, J. A. S. B., ii, p. 571 (1833) (Borabhum, Bengal).
Accipiter nisus. Blanf. & Oates, iii, p. 402 (part.).

Vernacular names. *Basha* ♂, *Bashin* ♀ (Hind.); *Wanapa dega* (Tel.).

Description. Above slaty-grey, darkest and blackish on the head, palest and purest grey on the rump, wing-coverts and scapulars,

the latter with white bases and large white patches which always show more or less; forehead and lores grey; feathers above the eye with white bases, forming a well-defined supercilium; bases of feathers on the nape white, showing through and forming a patch; wing-quills banded with blackish and with white bases below the notch; tail tipped pale and with four broad dark brown bands; most of the feathers above inconspicuously dark-shafted; lower parts white, pale buff or pale rufous, this colour generally stronger in tint on the sides of the breast; chin and throat with narrow rufous shaft-lines, extending on to the breast; breast, flanks, abdomen, vent and thigh-coverts with narrow rufous-brown bars; under wing-coverts and axillaries white with narrow dark brown bars; under tail-coverts white.

Colours of soft parts. Iris golden-yellow or orange, pale yellow in the young; bill slaty-blue with black tip; cere, legs and feet yellow, claws black.

Measurements. ♂, wing 204 to 216 mm.; tail 151 to 161 mm.; tarsus about 55 to 57 mm.; culmen 16 to 17 mm. ♀, wing 243 to 257 mm.; tail 183 to 207 mm.; tarsus about 61 to 65 mm.; culmen 18 to 19 mm.

Females only differ in being a less pure grey, more brown above and in being paler below.

Young birds are dark brown above, the feathers edged with rufous; the white bases to the feathers of the nape and neck are much more conspicuous; the breast is marked with brown heart-shaped spots of rufous-brown, turning to bars on the abdomen, flanks and thigh-coverts. The tail has five bars.

Distribution. Breeding North and Central Asia to Japan, in Winter South to almost the whole of India, Burma and South China. Kirke-Swann also records two individuals from Egypt. In India it occurs as far South as the Nilgiris but Kelaart's record of Ceylon is doubtful.

Nidification. This Sparrow-Hawk breeds in Manchuria and Eastern Siberia, whence I have a series of eggs taken by Emile Smirnoff. From his description the nests differ in no way from those of the next bird and the eggs also cannot be distinguished from theirs. Twenty eggs average 39·9 × 32·2 mm.: maxima 42·5 × 33·2 and 41·4 × 34·0 mm.; minima 37·3 × 29·8 mm. The breeding-season seems to be May and June. Both this Sparrow-Hawk and *Accipiter g. gularis* breed in Japan and records thence are mixed for they both breed in the same months.

Habits. This bird is only a Winter migrant to India and Burma, arriving in October and leaving in March. Whilst with us it keeps either to forest or to groves and orchards in well-wooded country. In the non-breeding season it is a silent bird and does not attract attention but it is very widely scattered all over India and Burma. Its habits generally are the same as those of the next and better-known bird.

(1812) Accipiter nisus melanoschistus.

THE INDIAN SPARROW-HAWK.

Accipiter melanoschista Hume, Ibis, 1869, p. 350 (Kotegarh, N.W. India).
Accipiter nisus. Blanf. & Oates, iii, p. 403 (part.).

Vernacular names. *Basha* ♂, *Bashin* ♀ (Hind.).

Description. Differs from the preceding race in being very much darker above and, frequently, in having the lower parts very much more rufous, more especially in the male.

Colours of soft parts as in the Asiatic Kestrel.

Measurements. ♂, wing 212 to 219 mm.; culmen 16 to 17 mm. ♀, wing 245 to 260 mm.; culmen 19 to 21 mm.

Distribution. Breeding throughout the Himalayas from Kashmir to Eastern Assam and through Tibet and Setchuan to North Burma; Yunnan.

Nidification. The Indian Sparrow-Hawk breeds in April, May and the first week in June at all heights from about 4,000 feet up to 10,000 feet, or perhaps higher still, though more commonly between 6,000 and 8,000 feet. It may sometimes build an entire nest for itself but in the majority of cases if the nests are carefully examined they will prove to have as their basis an old nest of another bird. About Simla, the Murree Hills and Kuman the Jungle-Crow's nest is the favourite one, whilst in Assam we found either this or a pigeon's nest was generally taken possession of. It probably breeds occasionally in in the Hills South of the Brahmapootra but I have only recently been able to identify skins of breeding-birds from that Province. The nests are always built at a considerable height from the ground, often at a very great height, whilst the tree selected is invariably in the interior of forest and generally a tree with dense foliage. Four or five eggs are laid, sometimes only three and I have seen one clutch of six. The eggs are just like those of the English Sparrow-Hawk. The majority have a pure white ground-colour, just tinged with skim-milk blue. These are blotched boldly and handsomely with deep rich red-brown, the markings generally more numerous at the larger end. Other eggs have a pink tinge in the ground-colour and have much more numerous and smaller blotches of reddish-brown scattered over the whole surface. Others again are paler and dingier, whilst yet others are merely stippled with reddish- or yellowish-brown. Forty eggs average 39·1 × 32·6 mm.: maxima **40·3** × 32·0 and 40·0 × **33·0** mm.; minima **36·0** × 30·6 and 38·9 × **29·0** mm. Its nest has occasionally been found built on cliffs but this is very exceptional.

Habits. This bird is a resident wherever found, though it may wander lower into the hills and adjacent plains during the coldest months of the year. During the breeding-season its shrill "trek-trek-trek" ending in a scream soon draws attention to its presence,

though the way it keeps to deep forest may make a sight of it difficult to obtain. It is a fine brave little bird, with a powerful dashing flight which it controls among trees in a marvellous manner. It feeds much on sparrows where these are obtainable but also on bigger birds up to the size of pigeons and also on small mammals, reptiles and big insects.

Accipiter virgatus.

Falco virgatus Temm., Pl. Col., i, pl. 109 (1822 ex Reinw. MS.).

Type-locality: Java.

The typical form differs from that found in India in being slightly smaller. Kirke-Swann separates *Accipiter affinis* as a full species on the grounds that *A. virgatus* has three bars on the tail whilst *A. affinis* has four. As a matter of fact *A. v. besra* seems always to have four, though Swann admits this to be merely a race of the Javan *virgatus*.

Key to Subspecies.

A. Smaller, wing, ♀, 182 to 189 mm.; above paler in both sexes at all stages ..... *A. v. besra*, p. 159.
B. Larger, wing, ♀, 197 to 210 mm.; above darker. *A. v. affinis*, p. 161.

(1813) Accipiter virgatus besra.

THE SOUTHERN BESRA SPARROW-HAWK.

Accipiter besra Jerdon, Mad. Journ. L. S., x, p. 84 (1839) (Soonda Jungles, South India).
Accipiter virgatus. Blanf. & Oates, iii, p. 404.

Vernacular names. *Besra* ♀, *Dhoti* ♂, *Khand Besra*, *Khandesra* (Hind.); *Vaishtapa dega* (Tel.); *Urchitlu* (Can.); *Ukissa* (Cing.).

Description. — **Male.** Above slaty-grey, the head, back and least wing-coverts generally darker and blackish; tail grey with four blackish bands, the basal often concealed by the coverts, the tip pale; outermost pair with five or six fainter dark bands; lores and feathers above eye in front whitish; sides of head and neck grey; on the nape the white bases of the feathers often show through; scapulars with large white drops; quills barred with black, faintly on the first primary, more strongly on the others and obsolete on the secondaries; the bases of the quills white on the inner basal halves, banded with black; chin and throat white with broad mesial streak and less definite lateral ones; upper breast and flanks rufescent; the centre sometimes white boldly streaked with rufous-brown; abdomen, posterior flanks and sometimes lower breast white barred with rufous or rufous-brown; under tail-coverts white; axillaries and under wing-coverts white with blackish spots and bars.

The under plumage varies greatly; some specimens, probably very old birds, have the whole breast and flanks rufous, this colour encroaching on to the abdomen and thigh-coverts as bars. Other specimens have only the sides of the breast marked with rufous and have these parts more or less white, the centres of the feathers rufous-brown.

Colours of soft parts. Iris golden-yellow or orange-yellow; in younger birds grey or greyish-white and, later, pale yellow; bill slate-grey with black tip; cere lemon-yellow; legs and feet bright yellow, claws horny-brown or blackish.

Measurements. ♂, wing 145 to 166 mm.; tail 114 to 118 mm.; tarsus 44 to 47 mm.; culmen 15 to 16 mm. ♀, wing 182 to 189 mm.; tail 136 to 145 mm.; tarsus 46 to 53 mm.; culmen 18 to 20 mm.

Female. Above dark brown, the crown still darker; the scapulars, wings and tail barred with blackish and marked with white as in the male; sides of head and neck brown; chin and throat white with broad mesial and lateral streaks of dark brown; upper breast and flanks rufous-brown, the feathers edged with white, making these parts look streaky; lower breast to vent and thigh-coverts white barred with rufous-brown, the edges of these bars darker; under tail-coverts white; axillaries and under wing-coverts white barred with black.

Young birds are like the female but have the edges of the feathers of the upper parts rufous, the head like the back; lower parts white to rufous-white; a broad blackish mesial stripe on the chin and throat and large rufous or rufous-brown marks forming bars on the flanks, broad streaks on the breast and heart-shaped drops on the abdomen, vent and thigh-coverts. There are sometimes five bars on the tail-feathers.

Distribution. Ceylon and South India. Common in Travancore and the Malabar Coast, apparently rare elsewhere; there are typical specimens in the British Museum from Mhow and two specimens labelled as from North Bengal from the Pinwill Coll. These may be wrongly marked. There is also a specimen from Madras.

Nidification. The Southern Indian Besra breeds from January to April in Travancore and Phillips took three hard-set eggs on the 14th of the latter month at an elevation of 3,500 feet in Ceylon. They generally, if not always, use old nests of other birds, repairing, building them up and adding good linings of green leaves and smaller twigs. The tree selected for the nest is nearly always a high tree in dense forest but occasionally Stewart has taken nests on trees in rubber-clearings. The normal clutch is three or four and very rarely five, whilst, on the other hand, two only are sometimes incubated. The eggs are like those of other Sparrow-Hawks but are on an average very lightly marked and are very bright, clean-looking eggs, the blue tint in the ground-colour absent or very faint, whilst the blotches are very

bold and dark and often with underlying clouds of grey. Forty eggs average 36·5 × 29·8 mm.: maxima **41·1** × 31·3 and 38·6 × **31·9** mm.; minima **34·4** × 28·2 and 34·7 × **27·8** mm.

Habits. This little Sparrow-Hawk is a bird of dense forests and but little was known about it until Stewart was so wonderfully successful in observing it. It is a very noisy little bird and constantly calls in a loud squealing tone to its mate who is never far away and promptly answers with another loud squeal. This cry seems to be common to all Sparrow-Hawks but varies greatly under different circumstances, rising to a chattering scream when the birds are angry or excited. They feed in Ceylon much on a species of small lizard but also eat locusts, grasshoppers, Coleoptera and small birds and mammals. They are bold speedy fliers, very active in forest and are, more especially the female, favourites for hawking small birds, especially quail and doves, whilst it is said to be so speedy in the open that it can even kill snipe.

(1814) Accipiter virgatus affinis.

THE NORTHERN BESRA SPARROW-HAWK.

Accipiter affinis Hodgs., Beng. Sport. Mag., New Series, viii, p. 179, (1836) (Nepal).
Accipiter virgatus. Blanf. & Oates, iii, p. 404 (part.).

Vernacular names. As in *A. v. besra.*

Description.—Adult male. Similar to the preceding bird but above much darker, more blackish-grey throughout, the head hardly darker than the back; below the colouring is also rather richer and deeper if stage by stage is compared.

Colours of soft parts as in the Southern Besra.

Measurements. ♂, wing 165 to 175 mm.; culmen 16 to 17 mm. ♀, wing 197 to 210 mm.; culmen 18 to 20 mm.

Female. This differs from the Southern Besra in being a darker chocolate-brown above and especially in its much darker slaty-black crown and nape; below there seems to be little difference.

Young birds appear to be darker brown and edged with rufous of a richer tint.

Distribution. Breeding Himalayas from the extreme West to Yunnan and the Western Chinese Hills. South it breeds in the Assam and Sarrma Valley ranges, as well as in Manipur, Lushai and the higher ranges of Northern Burma. In Winter it is found over the greater part of Northern India.

Nidification. The Northern Besra breeds during April and May, making a nest, on the basis of some old nest, in much the same manner and situation as the Southern bird. It breeds from quite low down—I have taken one nest at 1,500 feet—up to at least 7,000 feet. As a rule, the birds do not go beyond protests,

very noisy and vehement, when their eggs or young are interfered with but occasionally both parents will make repeated swoops at the intruder. The eggs number three or four, rarely five and occasionally two only. They cannot be distinguished from those of the preceding bird though, as would be expected, they average a little bigger, the average of fifty being 37·7 × 30·0 mm.: maxima 40·4 × 30·8 and 38·3 × 32·2 mm.; minima 35·0 × 29·6 and 38·4 × 28·8 mm.

Habits. Similar to those of the Southern form. Most of the birds obtained in Cachar had fed principally on insects but I have seen remains of small flying squirrels, mice, bats and birds, such as barbets, thrushes and bulbuls on and under their nests. They are very quick on the wing and I have seen them capture the small swift, *Tachornis b. infumatus*. They are jealous birds and allow no other Sparrow-Hawks to enter their particular piece of forest. In Winter they descend into the plains and at this time keep much less to forest and may be seen in fruit-groves and well-wooded open country.

Accipiter gularis.

Key to Subspecies.

A. Males barred throughout below.
  a. Darker ..... *A. g. gularis*, p. 162.
  b. Paler ..... *A. g. stevensoni*, p. 163.
B. Males obsoletely barred on flanks only .. *A. g. nisoides*, p. 164.

(1815) Accipiter gularis gularis.

THE JAPANESE SPARROW-HAWK.

Astur gularis Temm. & Schleg. in Sieb. Faun. Jap., p. 5 (1845) (Japan).

Vernacular names. None recorded.

Description. Plumage generally like that of other Sparrow-Hawks; the upper parts are blackish-slaty throughout, the rump but little paler than the head; the white marks on the nape and supercilium obsolete or, rarely, entirely absent; the ear-coverts are pale grey or vinous-grey, not mixed with chestnut or white as in the Indian forms of *nisus*; below the plumage varies from smoky vinous-white to ferruginous, the chin and throat white with a narrow black mesial line; there are faint traces of darker or paler barring on the abdomen and lower breast even in the oldest birds; under tail-coverts white; tail with four broad bands of blackish.

Colours of soft parts. Iris crimson (*La Touche*), straw-yellow in the female (*Whitehead*); bill slaty-blue, tipped black; cere and legs yellow, claws black.

Measurements. ♂, wing 165 to 173 mm.; culmen 14 to 15 mm. ♀, wing 186 to 198 mm.; culmen 16 to 18 mm.; tarsus 51 to 54 mm.; tail 117 to 137 mm.

Females are dark brown above, the head blackish-brown; there is a distinct mesial line on the throat and in fully adult birds barring on the whole of the lower parts from fore-neck to vent, the under tail-coverts alone being white.

Young birds are brown above, the feathers edged with buff or rufous, the head brown like the back; the mesial throat-streak is broader and the breast is marked with broad brown streaks, not barred; remainder of plumage as in the female; the outermost tail-feathers have five or six bars; the under tail-coverts are occasionally marked with a little brown in bars or streaks.

Distribution. North China to Japan, wintering as far South as the Philippines, Malay Archipelago and, rarely, Burma and even India.

Kirke-Swann records variation of depth of under plumage in males according to geographic distribution but the material in the British and Tring Museums is amply sufficient to show that it is individual only.

Nidification. This Sparrow-Hawk breeds in Japan in May and June, according to Ouston, principally in old nests of Crows. In a clutch of five sent to me the eggs vary from 38·8×32·1 to 40·8×31·4 mm.; these two eggs embracing all four extremes of measurement.

Habits. This is migratory bird, wandering very far in the Winter months, when it may be seen in the same country as the next two forms and, as the youngest birds travel farthest, it has been most difficult to determine the subspecific differences between them, the disentanglement being due to Robinson. In habits they seem to be very similar to the Common Sparrow-Hawk.

(1816) Accipiter gularis stevensoni.

THE PALE EASTERN SPARROW-HAWK.

Accipiter stevensoni Gurney, Ibis, 1863, p. 447 (Hongkong).

Vernacular names. None recorded.

Description. Similar to the preceding bird but distinctly paler, both in the male and female, most noticeably on the lower plumage.

Colours of soft parts as in the other races.

Measurements. Wing, ♂ 162 to 173 mm., ♀ 184 to 193 mm.

Distribution. Northern China to Manchuria, migrating South to the Indo-Chinese countries, Burma, the Malay Peninsula and Archipelago.

Nidification. Unknown.

Habits. Similar to those of the preceding form.

(1817) Accipiter gularis nisoides.

THE INDO-CHINESE SPARROW-HAWK.

Accipiter nisoides Blyth, J. A. S. B., xvi, p. 727 (1847).
Accipiter virgatus. Blanf. & Oates, iii, p. 404 (part.).

Vernacular names. None recorded.

Description. Similar to the Japanese Sparrow-Hawk but darker, the male especially very dark, the lower plumage intensely rufous and the bars restricted to the flanks and even these often obsolete.

Colours of soft parts as in the other races.

Measurements. Wing, ♂ 156 to 165 mm., ♀ 182 to 194 mm. The male is curiously smaller than that of the other races and though the extreme measurements of the female are much the same, the average is decidedly smaller than in either *A. g. gularis* or *A. g. stevensoni*.

Distribution. Resident in South China from Fokhien, through the Indo-Chinese countries to Burma and the Andamans and South to the Malay States, Sumatra, etc.

Nidification. Similar to that of *A. virgatus*. Hopwood took nests, presumably of this Sparrow-Hawk, in South Tenasserim in April whilst Wickham and Osmaston found eggs from February to April in the Andamans. In the latter islands they were breeding in old nests of Crows in the avenues at Port Blair and Wickham found them very fierce and plucky in defending their eggs. Fourteen of these average 36·7 × 29·5 mm.: maxima **38·9 × 31·1** mm.; minima **33·2 × 28·0** mm.

Habits. Those of the genus. A forest-loving bird and but seldom seen though its shrill squeals sometimes reveal its presence.

Genus PERNIS.

Pernis Cuv., Règne An., i, p. 322 (1817).

Type, *Falco apivorus* Linn.

The genus *Pernis* is distinguished from all other Accipitrine genera by having the lores and the sides of the head, forehead and chin covered with small scale-like feathers, with no bristles or prolonged shafts.

The bill is weak, rather long and not much hooked, the festoon being small or absent; the nostrils are long, narrow and oblique, the upper margin membranous. The wings are long, the third and fouth subequal and the fifth a little shorter; tail moderately long and slightly rounded; the tarsus is stout, short and feathered on the upper half in front, the naked parts covered with small hexagonal scales; toes long, covered above with bony transverse shields, all divided except the last two or three; claws long and slightly curved, the middle one dilated on the inner side.

The genus is found in Europe and Africa to Central Asia extending to the Malay Archipelago and China.

Key to Species.

A. Black subterminal and median bands nearly as wide as paler bands ..... *P. ptilorhynchus*, p. 165.
B. Black subterminal and median bands much narrower than paler bands..... *P. apivorus*, p. 168.

Pernis ptilorhynchus *.

Key to Subspecies.

A. Larger, wing 398 to 455 mm. ..... *P. p. ptilorhynchus*, p. 165.
B. Smaller, wing 388 to 416 mm. ..... *P. p. ruficollis*, p. 167.



Fig. 23.—Head of *P. p. ruficollis*. ½.

(1818) Pernis ptilorhynchus ptilorhynchus.

THE JAVAN CRESTED HONEY-BUZZARD.

Falco ptilorhynchus Temm., Pl. Col., pl. 44, 1823 (Java).
Pernis cristatus. Blanf. & Oates, iii, p. 406 (part.).

Vernacular names. None recorded.

Description. The plumage of the adults is more variable than in any other of our Indian Raptores and might almost be described as polymorphic. Adults may, however, be always recognized by

* See Robinson and Kloss, Journ. Nat. Hist. Soc. Siam, v, p. 94, 1923.

the tail, which is narrowly tipped pale with a broad subterminal band of black; this is followed by a slightly broader band of mottled white, grey and brown and this by another broad band of black; between this black band and the brown base is a narrow band of mottled pale brown and white or grey.

In one phase the head is very dark brown, changing to black on the nuchal crest; the face, sides of the head and neck grey, chin and throat grey, the white bases showing everywhere, changing to blackish on the fore-neck and with mesial and lateral black bands; primaries edged with silver-grey and tipped blackish and all quills with white internal bases, barred with blackish; lower parts brown with white bars; in some cases these are concealed, in others show plainly everywhere; in a few specimens the lower parts appear to be boldly barred black and white from the breast to the vent, this being the form described as *tweedalei*.

Another phase has the breast pale brown, with broad central streaks, the chin and throat almost white with black shafts and some black patches on the fore-neck; the remainder of the lower parts white with broad bars of pale fulvous brown, generally with narrow black shaft-stripes throughout; between this and the last phase there is every intermediate stage.

Yet another phase has the whole lower plumage rufous except for the mesial and lateral black throat-stripes.

Colours of soft parts. Iris golden-yellow to orange-red; browner in young birds; bill blackish or slaty-black, the base plumbeous; cere bluish-slaty; legs and feet yellow, claws black.

Measurements. Wing 398 to 455 mm.; tail 241 to 263 mm.; tarsus 44 to 49 mm.; culmen 30 to 36 mm.; a female from Mindanao has a tail of 298 mm. and tarsus of 59 mm.

Young birds have the upper plumage brown, each feather edged and tipped paler or white, very broadly so on the scapulars, wing-coverts and inner secondaries; the head and neck is often more white than brown, the feathers of the crown being brown with white bases and tips and black central streaks; the lores and a line through the eye black; the underparts are white or fulvous-white, with a few fine streaks on the breast and flanks and the latter also with a few pale brown bars.

A pair of nestlings of the next race brought to me in down moulted out into this stage but without any bars or striations; in the following spring they assumed a brown upper plumage with hardly any pale edgings but the under plumage became pale brown or fulvous, with streaks of dark brown plentiful on the breast and much white barring on the lower breast, flanks and abdomen; the tail remained as in the first stage, dark brown with a white tip and numerous pale brown bars becoming white on the inner webs.

The third year they became more uniformly dark and the tail became almost as definitely and broadly banded as in the adult but the basal half was much broken and barred.

The fourth spring one bird moulted into the all brown phase and the other into the third phase described above.

Distribution. Java, Sumatra, Borneo, Philippines, through Malay States to Tenasserim. I cannot separate *celebensis* from this form and it should be noted that the characters relied on by Sharpe to diagnose the species of *Pernis* are all individual and not specific or even subspecific characters.

Nidification. Nothing recorded.

Habits. Apparently very much the same as those of the next race but is found far more frequently in forest. Like its Indian cousin, in addition to honey, it eats small reptiles, birds and mammals.

(1819) Pernis ptilorhynchus ruficollis.

THE INDIAN CRESTED HONEY-BUZZARD.

Pernis ruficollis Lesson, Traité d'Orn., p. 76, 1831 (Bengal).
Pernis cristatus. Blanf. & Oates, iii, p. 406 (part.).

Vernacular names. *Shahutela, Mailkáre* (Hind.); *Madhava* (Nepal); *Tenu gedda* (Tel.); *Ten Pandu* (Tam.); *Jen alawa* (Can.); *Jutalu* (Yerkli); *Malsuwari* (Mhari); *Katta parantha* (Travancore).

Description. Similar to the preceding bird but with the crest much less developed. In this race the great majority of fully adult birds assume the all brown plumage and, on the other hand, I have never seen any Indian specimen similar to the black and white barred phase from Malaya, named *tweedalei*.

Colours of soft parts as in the preceding bird.

Measurements. Wing 388 to 416 mm., rarely up to 425 mm.; tail 225 to 254 mm.; tarsus 47 to 50 mm.; culmen 33 to 37 mm.

Young birds go through the same changes as the typical form.

Distribution. Ceylon and India from the extreme South, North to the Punjab but not Sind*; Bihar, Bengal and Assam both North and South of the Brahmapootra; Burma as far East as the Ruby Mines district (*Hopwood*) and the Southern Shan States (*J. P. Cook*).

Nidification. This Honey-Buzzard breeds in the plains of Northern India and occasionally in the hills up to 4,000 feet during April, May and June but in Southern India most birds lay in February whilst in Dacca also I took a nest on the 16th of that month. Blewitt, however, got eggs as late as the 10th July at Hansie. The birds build their own nests of small sticks, spending a month to six weeks over its construction, lining it sometimes with grass but always with a final bed of green leaves. The nest varies greatly in size but is generally between 18 and 24 inches

* Blyth, Str. Feath. i. p. 103, records seeing a specimen in Sind.

across and about 6 to 12 inches deep, with a well-made depression for the eggs. The tree in which it is placed may be a solitary one in plain or in cultivation, one of an orchard or grove, or one in a garden. The eggs number two, occasionally only one, and vary in an extraordinary manner. Some are brick-red all over, the paler ground hardly showing at all, though some have deeper blotches of blood-red over the brick-red. Some are like gigantic eggs of the Kestrel, some marked like Sparrow-Hawks' eggs, whilst many are just like richly-marked eggs of Kites, from which they could not be distinguished but for their yellow inner membrane. A very beautiful type has a white or pale cream ground-colour with clouds and smears of deep blood-red brown, underlying which are others of plum-grey. Forty eggs average 52·7 × 42·7 mm.: maxima **57·0** × 45·3 and 53·2 × 45·5 mm.; minima **49·5** × 43·0 and 50·0 × **39·0** mm.

Habits. This fine bird frequents well-wooded open country, rarely being found in deep forest or the drier plains. It is a bold bird, often haunting the vicinity of towns and villages, freely entering gardens and parks. It occasionally soars but its normal flight is a quick flapping, unrelieved by sailing, from one tree to another. It feeds principally on bees and their honey, wax and larvæ and the one time it really indulges in hard exercise and quick movement is when it gets into a migratory swarm of bees—an event I was once fortunate enough to see. It also eats small snakes, lizards, frogs, mammals and birds and is a confirmed stealer of other birds' eggs and young. The note is a high-pitched short whistle, repeated quickly.

Pernis apivorus.

Falco apivorus Linn., Syst. Nat., 10th ed. i, p. 91 (1758).

Type-locality: Sweden.

The typical form is smaller than the one which migrates into India in Winter.

(1820) Pernis apivorus orientalis.

THE SIBERIAN HONEY-BUZZARD.

Pernis orientalis Tacz., Faune Orn. Sib. Or., i, p. 50, 1891 (Lake Baikal).

Pernis cristatus. Blanf. & Oates, iii. p. 406 (part.).

Vernacular names. As in the preceding bird.

Description. Similar to the preceding birds according to age but adults have the tail quite different; the subterminal and median blackish bars are comparatively narrow and separated by a much broader mottled grey band. The subterminal narrow band shows well even in many individuals which are not fully adult.

Colours of soft parts as in the preceding race.

Measurements. Wing 432 to 483, few over 460 mm.; tail 242 to 267 mm.; tarsus 47 to 50 mm.; culmen 33 to 37 mm.

Distribution. Breeding Eastern Siberia from Lake Baikal and the Yenesei. South in Winter to China and Northern India and in Burma as far South as Tenasserim and even into the Malay States.

Nidification. Nothing recorded.

Habits. I can find no information but probably they do not differ from those of the European Honey-Buzzard.

Genus **MACHÆRAMPHUS.**

Machæramphus Westerm., Bijd. tol. d. Dierk., i, p. 29, pl. 12 (1848).

Type, *Machæramphus alcinus* Westerm.

The present remarkable genus has the lores and face clothed with fine soft velvety feathers, quite unlike the scale-like feathers of *Pernis*. The bill is slender, much compressed, with the culmen greatly curved from the cere, which is small and thin; the gape is exceptionally large and wide; the nostril is long, narrow and horizontal and is placed immediately in front of the lores; the wing is long, the second and third subequal or the third longest; tail rather short and square; tarsi feathered on the upper third in front, the naked portion with small scutæ in front and reticulated elsewhere; toes long, the outer toe longer than the inner and the soles with enlarged knobs at the joints, middle claw dilated on the inner side. A well-developed nuchal crest.

Two species are known, one African and one found from Tenasserim through the Malay Archipelago to New Guinea.

(1821) **Machæramphus alcinus.**

THE SLENDER-BILLED PERN.

Machæramphus alcinus Westerm. in *loc. cit.* (1848) (Malacca).
Machærhamphus alcinus. Blanf. & Oates, iii, p. 408.

Vernacular names. None recorded.

Description. Feathers round the eye white; throat and fore-neck pure white, the chin and a mesial line black; upper breast with a certain amount of white; remainder of plumage black, the bases of the feathers browner and showing through in some places; in very freshly-moulted birds the black has a distinct gloss but in bleached specimens the black turns very brown.

Colours of soft parts. Iris bright yellow; bill and cere black legs and feet pale plumbeous (*Davison*).

Measurements. Wing 371 to 412 mm; tail 171 to 177 mm.; tarsus 58 to 62 mm.; culmen 21 to 24 mm. The material available does not show to what extent the sexes differ in size.

Young birds are possibly barred or mottled on the inner bases of the tail-feathers, as some specimens in the British Museum show signs of this mottling and these same individuals show more white on the breast.

Distribution. South Tenasserim, Malay Peninsula, Malay Archipelago to New Guinea.

Nidification. Robinson informs me that he saw a pair of these birds with their nest on an immense oil-tree, standing in comparatively open ground on the outskirts of heavy forest and close to the limestone-cliffs.

Habits. This curious bird is essentially crepuscular and Robinson says that one never sees anything of it until about 6 in the evening, when it may be seen hunting bats which form its staple food. As might be expected it haunts forest or open, but well-wooded, country in the vicinity of the limestone-cliffs, in the numerous caves of which the bats harbour in vast numbers.

Nidification. Nothing recorded.

Habits. Very little known. Robinson and Kloss say that it is not uncommon in the Malay Peninsula but that owing to its crepuscular habits and powerful flight it is but seldom observed.

Genus **BAZA.**

Baza Hodgs., J. A. S. B., v, p. 777 (1836).

Type, *Falco leuphotes* Temm.

I can see no structural or other differences between *Baza leuphotes* and *Baza jerdoni* necessitating their being placed in different genera and follow Blanford in placing them both in the genus *Baza*, which has priority over *Lophastur*.

The genus contains certain birds the exact position of which it is difficult to determine. The stout feet and tarsi resemble those of *Astur*, whilst the partly-feathered lores seem to show a connection with *Pernis*. In nesting-habits they resemble *Astur* and *Butastur*.

In this genus the bill is strong and well curved and the upper mandible is furnished with a double tooth; the cere is small, the narrow, slanting nostril being placed at its front edge, with a membrane partly covering it; the tarsus is short and stout, scutellated in front and above the toes, reticulated elsewhere; the upper third or more is feathered in front; wings moderate, the third longest in *leuphotes*, the fourth in *jerdoni*; tail long, the end square or very slightly graduated.

The genus is represented in Africa, Madagascar and the Oriental Region to Australia.

In my Catalogue I used the name *Lophastur* for *leuphotes* but it was proposed for *jerdoni* and would have to be used for that bird if generically separated. *Aviceda* was proposed for an African form.

Key to Species.

A. Upper plumage principally black; third primary longest ..... *B. leuphotes*, p. 171.
B. Upper plumage brown; fourth primary longest or fourth and fifth subequal ..... *B. jerdoni*, p. 173.



Fig. 24.—Head of *B. l. leuphotes*. ⅔.

Baza leuphotes.

Key to Subspecies.

A. Band across chest mainly rufous and chestnut ..... *B. l. leuphotes*, p. 171.
B. Band across chest nearly all black ..... *B. l. burmana*, p. 173.

(1822) Baza leuphotes leuphotes.

THE INDIAN BLACK-CRESTED BAZA.

Falco leuphotes Dumont, Dict. Sci. Nat., xvii, p. 217 (1820) (Pondicherry).
Baza lophotes. Blanf. & Oates, iii, p. 409 (part.).

Vernacular names. *Dao-kwa Daoling* (Cachari).

Description. Whole head and neck, back, rump, upper tail-coverts and tail black; outermost tail-feathers narrowly tipped white, feathers of back with broad white bases, showing through in places; scapulars black with deep chestnut bands and most of the bases white, the latter showing in bold patches; wing-coverts

black; primaries black with some chestnut on the bases of the outer webs and some of the inner ones, secondaries black, the inner marked with chestnut and white like the scapulars; below the fore-neck is a broad white band succeeded on the lower breast by a wide chestnut band, sometimes blackish next the white breast; centre of abdomen, vent and under tail-coverts black; remaining lower parts fulvous banded with chestnut, these bands decreasing and sometimes absent posteriorly, greater under wing-coverts, under aspect of tail and much of the under aspect of the wing grey; remaining under wing-coverts and axillaries black.

Colours of soft parts. Iris purple-brown or crimson-brown; bill deep slaty- or horny-plumbeous, upper mandible tipped black, lower whitish; cere plumbeous-blue; legs and feet dull plumbeous to plumbeous-blue, claws horny-brown.

Measurements. Wing 227 to 243 mm.; tail 130 to 145 mm.; tarsus 26 to 27 mm.; culmen 20 to 22 mm.

Young birds not known, the differences to the adult generally given being geographical, not of age.

Distribution. Nepal Terai, Sikkim and Eastern Bengal to Eastern Assam, North of the Brahmapootra; Travancore and Ceylon.

Nidification. The Black-crested Baza breeds from April to June in Northern India and in February, March and April in Travancore, whilst Stewart also took one nest with eggs on the 4th of July in that Province. The nest, which is placed on either small saplings or lofty trees, is well and compactly made of small twigs lined with grass or fibre, with an over-layer of green leaves. The tree selected seems to be always one in deep forest and, in preference, one near water. The eggs, two or three in number, are grey-white, generally much stained with tan-yellow. In shape they are broad obtuse ovals and twenty-four average 37·4×31·1 mm.: maxima **46·0**×31·0 and 39·1×**32·1** mm.; minima **34·9**×29·5 and 36·5×**28·9** mm.

Habits. This beautiful Raptore is a forest bird but likes best forests with wide streams running through them or with broad glades and casual open spaces. They were not uncommon in Upper Assam and could often be seen in small parties of from three to five, sailing round in small circles, just over the tree-tops, every now and then flapping along like a party of Crows. Their movements are very leisurely but they are generally shy birds and difficult to approach within shot, though occasionally they seem very obtuse and lazy. This, however, is only when the sun is hot and glaring, for they are very crepuscular in their habits as their beautiful lustrous eyes would indicate. They live principally on insects—locusts, grasshoppers, Cicadæ and termites especially—but they also sometimes eat bats, mice, shrews, lizards and tree-frogs. Their cry is a quivering plaintive scream, like the softened squeal of the Kite and is uttered both on the wing and when seated.

(1823) Baza leuphotes burmana.

THE BURMESE BLACK-CRESTED BAZA.

Baza lophotes burmana W. L. Sclater, Bull. B. O. C., xli, p. 3, (1920) (Malewoon, Tenasserim).
Baza lophotes. Blanf. and Oates, iii, p. 409 (part.).

Vernacular names. *Dao-kwa Daoling* (Cachari).

Description. Differs from the preceding bird in having less chestnut marking on the upper plumage and in having the band below the white breast almost wholly black.

Colours of soft parts as in the Indian form.

Measurements. Wing 221 to 246 mm.; tail 130 to 149 mm.; tarsus 25 to 30 mm.; culmen 20 to 23 mm. Sexes do not appear to differ in size in the Bazas.

Nestlings are covered with white down.

Young birds probably moult direct into the adult plumage. Two young birds said to have been taken from the nest and kept some weeks before being brought to me did not differ from the adults except, perhaps, in having more chestnut and white on the upper plumage.

Distribution. Assam South of the Brahmapootra, Burma, Siam, Indo-China and North Malay Peninsula.

Nidification. I took a nest of this Baza in Sylhet, South Assam, on the 22nd June containing two eggs, measuring 38·2 × 31·8 and 39·1 × 31·4 mm. In colour they are probably abnormal. They have the usual chalky grey-white ground but one egg has three fine blotches of red-brown at the larger end and the second has the smaller end stippled with pale reddish and a few small spots of lavender-grey at the larger end. The nest was in dense forest near some rice-fields and was just like that of the preceding bird. Hauxwell took three eggs from a similar nest on April the 30th in the Thoungyin Valley. These were the normal white in colour.

Habits. Quite the same as those of the preceding bird. It is not rare in North Cachar but seems to keep to forests in the broken country and plains at the foot of the hills up to some 3,000 feet. The stomachs of the birds I examined contained masses of green caterpillars and grasshoppers.

Baza jerdoni.

Key to Subspecies.

A. Larger; wing over 320 mm. ..... *B. j. jerdoni*, p. 174.
B. Smaller; wing under 315 mm. .... *B. j. ceylonensis*, p. 175.

(1824) Baza jerdoni jerdoni.

BLYTH'S BAZA.

Lophastur jerdoni Blyth, J. A. S. B., xi, p. 464 (1842) (Malacca).
Baza jerdoni. Blanf. & Oates, iii, p. 411.

Vernacular names. None recorded.

Description *.—**Male.** Centre of crown, nape and long occipital crest black, the latter with narrow white tips; sides of crown, sides and back of neck black, each feather broadly edged with rufous; narrow rim of feathers above and below the eye black, below the latter a white patch; lores and sides of head ashy, or ashy mixed with rufous; back to rump dark brown; the feathers blackish on the terminal quarter, the scapulars, innermost secondaries and upper tail-coverts showing definite deep brown bands; tail brown with three dark bands, the terminal broadest and darkest; wings dark brown, the greater coverts and quills banded with blackish, the latter tipped paler in freshly moulted specimens and with the inner webs white below the notch contrasting strongly with the dark bands; chin and throat rufous, white in the middle with a bold mesial line of black; breast rufous-brown, black-shafted and with white edges and bases; remaining underparts banded rufous-brown and white, the former edged with blackish; under wing-coverts barred rufous and white, the greater coverts very pale; axillaries like the flanks.

Colours of soft parts. Iris golden-yellow; bill plumbeous-black, the base bluish-slate, the tip and culmen quite black; cere pale bluish-plumbeous to almost black; legs and feet chrome-yellow or "white slightly tinged with blue" (*Hume*), claws horny-black; "tarsus china-white" (*Stevens*).

Measurements. Wing 327 (Sumatra) to 360 mm. (Sikkim); tail 210 to 244 mm.; tarsus 35 to 40 mm.; culmen 29 to 30 mm.

Female. Similar to the male but paler above; below the plumage is creamy or fulvous-white, with pale rufous streaks on the chin, throat and breast and bars of the same colour on the rest of the lower plumage; the mesial streak on chin and throat is much less defined; the forehead, sides and fore-crown are pale fulvous streaked with rufous, the centre of the hind-crown darker and the crest black, tipped with white; tail with three bars and a broken fourth, concealed by the coverts.

Young birds are like the adult females, though the young males soon become darker above; the tail has four or sometimes five distinct bands and the bases of the feathers are much mottled with white.

* Messrs. Robinson and Kloss have dealt very fully with this *Baza*, 'Ibis,' 1911, p. 25. Their conclusions as to age and sex differences seem sound and are now adopted.

Still younger birds have the feathers of the upper plumage fringed with white; the wing-coverts light rufous-brown fringed with white; the lower parts are paler and still more feebly barred and streaked than in the female; the tail has five dark bars, the basal one partly concealed.

Distribution. Sikkim to Eastern Assam, Burma, Malay Peninsula to Sumatra.

Nidification. Blyth's Baza breeds in Sikkim between 2,000 and 6,000 feet, possibly a good deal higher, from April to June, making a nest only differing from that of the last species in being larger. Two nests were found in the Darjeeling district by Primrose and Morrison, the one at 2,000 feet the other at 6,000, built in lofty forest-trees just on the edge of tea-cultivation. Each nest contained two eggs, well incubated, which measure 44·8 × 35·6, 44·0 × 36·7, 44·3 × 37·2 and 45·7 × 37·0 mm. They are unspotted chalky-white and much stained.

Habits. Very little on record and it has always been considered a very rare bird though probably this is because it is very crepuscular and haunts very dense forest. In Assam we often saw it. Stevens records seeing it many times at Rangagora and in North Lakkimpur, Coltart and I saw it several times at Magherita, Primrose saw it in Goalpara and again in the Darjiling Terai. In its habits it does not differ from *Baza leuphotes* but it seems to soar less. It feeds much on lizards and frogs, many of the former of considerable size, and on insects, larvæ and eggs.

(1825) Baza jerdoni ceylonensis.

LEGGE'S BAZA.

Baza ceylonensis Legge, Str. Feath., iv, p. 247 (1876) (Kandy Ceylon); Blanf. & Oates, iii, p. 411.

Vernacular names. None recorded.

Description. Sex for sex and age for age exactly like the preceding bird but rather smaller. The supposed differences between the two forms, so far as can be decided from the small number of skins available, are purely individual or those of sex and age.

Colours of soft parts as in the preceding form.

Measurements. Wing 299 to 312 mm.; tail 201 to 211 mm.; tarsus 36 to 37 mm.; culmen 28 to 29 mm.

Distribution. Ceylon and Travancore. There is also a juvenile specimen from the Wynaad in the British Museum which appears to be referable to this race.

Nidification. The only naturalist who has taken the nests and eggs of this Baza is Stewart, who obtained a very fine series. The nests are described as well-made structures of smallish sticks

and twigs, sometimes lined with grass and roots and nearly always finished off with green leaves. It may be placed either in a small sapling some twenty or twenty-five feet from the ground or in some forest giant five times as high as that. They seem to have a preference for trees near the edge of forest glades and openings, such as the banks of streams. The eggs number two or three and are an unspotted grey-white, nearly always considerably stained and, occasionally, the whole surface a rich buffy-red. Twenty-four eggs average 44·1 × 36·3 mm.: maxima **46·3** × **37·4** mm.; minima **41·1** × 35·9 and 42·0 × **35·0** mm. They breed from February to April, most eggs being laid in March.

Habits. Stewart says that the Baza is rare in Travancore and difficult to locate. The habits he describes as much the same as those of other Bazas. In Ceylon, where very few specimens have ever been collected, nothing is recorded of its habits beyond the fact that it is known to frequent forest in the broken lands and low hills.



Fig. 25.—*Streptopelia s. suratensis.*

Order IV. COLUMBÆ.

The Pigeons and Doves are now universally given the status of an Order by themselves, both by systematists and by field-naturalists, for, although they show affinities with many other Orders in many respects, yet in others they are widely differentiated from them.

In their anatomy the Pigeons are very closely related to the Gallinaceous birds and yet more closely to the *Pterocletes* or Sandgrouse, though they differ widely from either of these groups in having their young born naked and helpless, a character which induced some of the older systematists to classify them with the Passeres. Certain other anatomical characters would seem to form connecting-links with the *Strigidæ* (Owls) and *Gypidæ* (Vultures), greatly as they differ from both of these in general form, structure, external appearance and life-habits.

On the whole the position in which Blanford placed them, *i. e.* next to the Sandgrouse, seems the best and there I retain it.

Family COLUMBIDÆ.

Salvadori, in vol. xxi of the British Museum 'Catalogue of Birds,' divides the Pigeons into five families, of which the two most easily separated, the *Gouridæ* and *Didunculidæ*, are not represented in our regions.

The three remaining families are the *Treronidæ* or Green Pigeons, which frequent and roost in trees; the *Columbidæ* or True Pigeons, which frequent trees principally but are also found about buildings or cliffs and can run and walk well on the ground; the *Peristeridæ* or Doves, which are much given to walking on the ground. Following Blanford, I unite these three families in one, the *Columbidæ*, in which we find the structural features of the order *Columbæ*, in so far as that refers to the countries with which we are dealing.

In the Pigeons the palate is schizognathous, nostrils schizorhinal; basipterygoid processes present; dorsal vertebræ heterocœlous, cervical vertebræ fifteen in number; sternum with four deep posterior notches, the inner pair of which may be converted into foramina; the external lateral processes are much shorter than the internal; furcula U-shaped. The deep plantar tendons are united with a vinculum, the hallux connected with the flexor longus hallucis and the three front toes with flexor perforans digitorum. The ambiens muscle is sometimes present; the femoro-caudal, semitendinosus, accessory semitendinosus and accessory femoro-caudal present in all Indian species; oil-gland nude or wanting; cæca and gall-bladder sometimes present, sometimes absent; both carotids always present. The external characters are: upper mandible having the most slender portion posterior to the tip; the basal portion, which contains the nostrils, is covered with a cere or soft skin; the tip is swollen, hard and convex, giving the appearance of having a small knot. The four toes are on the same level, webless, with the hallux or hind-toe well developed; the soles are broad but differ in this respect in the different subfamilies, being most greatly expanded in the *Treronidæ* or Green Pigeons. Wings acquincubital, long and pointed, with close-set coverts, eleven primaries and the fifth secondary wanting. Spinal feather-tract well developed and forked on the interscapulary region; after-shaft rudimentary or entirely wanting.

In dividing the Family *Columbidæ* into subfamilies, it is difficult to find structural characters of any great value. The broad soft-soled feet of the entirely arboreal Green Pigeons divide them definitely from the Doves with their slender hard-soled feet, whilst others are intermediate. Again, in so far as our Indian birds go, the number of tail-feathers, 12 or 14, divide Pigeons and Doves into two groups. At the same time with so great a number of

species a division into groups is an assistance both to the Museum student and to the field-naturalist, so I therefore retain Blanford's six subfamilies, to which the following are alternative keys.

Key to Subfamilies (1).

A. Tail of fourteen feathers *.
  a. No ambiens muscle present.
    a'. Oil-gland absent ..... *Treroninæ*, p. 179.
    b'. Oil-gland present ..... *Geopeliinæ*, p. 257.
  b. Ambiens muscle present ..... *Duculinæ*, p. 202.
B. Tail of twelve feathers.
  c. Ambiens and oil-gland present; no cæca.
    c'. Tarsus longer than middle toe..... *Calœnadinæ*, p. 212.
    d'. Tarsus moderate, not as long as middle toe ..... *Phabinæ*, p. 214.
  d. Ambiens, oil-gland and cæca present.... *Columbinæ*, p. 218.

(2)

A. Tail of fourteen feathers.
  a. Plumage generally with much green. Wings always over 125 mm., always under 200 mm.; soles of feet broad and fleshy ..... *Treroninæ*, p. 179.
  b. Plumage dull, no green; wings always under 125 mm.; soles of feet not broad or fleshy ..... *Geopeliinæ*, p. 257.
  c. Plumage various; size large, the wing always over 215 mm.; soles of feet not broad or fleshy ..... *Duculinæ*, p. 202.
B. Tail of twelve feathers.
  d. Neck-hackles long and green ..... *Calœnadinæ*, p. 212.
  c. No hackles on neck.
    a'. Plumage above dark, metallic green; bill red; wing under 150 mm..... *Phabinæ*, p. 214.
    b'. Plumage not glossy or, if glossed, to some extent, the wing is over 200 mm. *Columbinæ*, p. 218.

Subfamily TRERONINÆ.

This Subfamily contains the Green Pigeons, beautiful birds recognizable by their bright green or yellowish-green plumage and the exceptionally broad, fleshy soles to their feet. The wings are marked with one or two broad yellow bars and the upper plumage often mixed with maroon. The tail-feathers number fourteen and vary much in shape; the wings are long and pointed and the primaries differently shaped in different genera (*vide* Plate L.); the tarsus is stout and very short, the upper part well feathered.

* Very irregular in *Myristicivora*, in which the tail-feathers sometimes number 12 only.

The Subfamily extends throughout the tropical and subtropical regions of the Old World, five genera being found within the limits of this work.

The division of the Subfamily into genera is one of great difficulty, for the structure of the wing has been used as a generic character without a sufficient examination, so that in the result we find that at the present time certain genera, especially *Dendrophasa* (*Osmotreron* auct.), contains species and subspecies which in no way conform with the diagnosis of the genus. At the same time the formation of the wing, when used in conjunction with other characters, such as the position of the ramphotheca, does seem to form a very valuable character, enabling one to work out groups which seem both natural and convenient. I have had the advantage of working out this Family, *Columbidæ*, with Mr. H. Robinson, who has himself been studying them and has given me his notes thereon. We are agreed that, in so far as Indian birds are concerned, the following key is as satisfactory as is possible at present.

Key to Genera.

A. Primaries strongly attenuated ..... CROCOPUS, p. 180.
B. Primaries blunt or very slightly attenuated.
a. Third primary strongly scalloped.
a'. Ramphotheca remote from forehead .. DENDROPHASA, p. 184.
b'. Ramphotheca reaching or nearly reaching forehead.
a''. Primaries slightly attenuated; third primary widely and deeply scalloped. TRERON, p. 195.
b''. Primaries blunt; third primary widely but shallowly scalloped.... BUTRERON, p. 197.
b. Third primary expanded and not scalloped. SPHENOCERCUS, p. 198.

Genus **CROCOPUS**.

Crocopus Bonaparte, Consp. Av., ii, p. 77 (1854).

Type, *Columba phœnicoptera* Lath.

In this genus the bill is stout and the ramphotheca, or horny terminal half, occupies only about half the length of the bill; the tip is well curved; the wing is long and pointed, the first three primaries acuminate, the third sinuate or deeply scalloped on the inner web near the centre; tail square and never graduated; under tail-coverts reaching to three-quarters the length of the tail; feet with broad fleshy soles, tarsi stout and feathered on the upper half.

There is but one species, which is represented by geographical races extending all over the Indian Empire, Ceylon and Cochin China. This species differs conspicuously from all other Green Pigeons in having yellow and not red legs, and in having the sexes alike.

Key to Subspecies.

A. Breast yellow, abdomen grey.
  a. Upper tail-coverts and base of tail both yellowish and not contrasting. *C. p. phœnicopterus*, p. 181.
  b. Upper tail-coverts grey, contrasting with yellow base of tail..... *C. p. viridifrons*, p. 183.
B. Breast and abdomen both yellow .... *C. p. chlorogaster*, p. 184.

This genus seems hardly separable from the African genus *Vinago*, the type of which, *Vinago waalia*, has both bill and wing formula exactly like *Crocopus*. On the other hand, *Vinago* as now accepted also includes other birds which are utterly unlike any true *Crocopus*, especially in their bills.

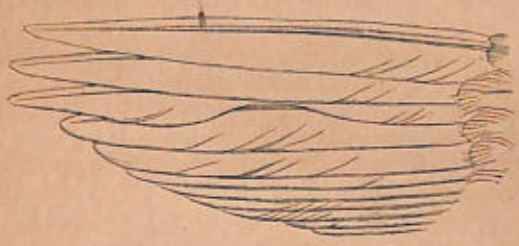


Fig. 26.—Wing of *C. p. chlorogaster*. ½.

(1826) Crocopus phœnicopterus phœnicopterus.

THE BENGAL GREEN PIGEON.

Columba phœnicoptera Lath., Ind. Orn., ii, p. 597 (1790) (*in insula* Eimeo).
Crocopus phœnicopterus. Blanf. & Oates, iv, p. 5 (part.).

Vernacular names. *Harial* (Hind.); *Haitha* or *Bor Haitha* (Assam); *Daorep gadeba* (Cachari); *Inruigu* (Naga).

Description. Forehead to the eye, lores, chin and throat greenish-yellow; crown to nape, upper cheeks and ear-coverts ash-grey; hind-neck bright chrome followed by a band of pure grey; remainder of upper plumage, wing-coverts and innermost secondaries yellowish olive-green; upper tail-coverts the same but sometimes tinged with grey; tail above grey with a broad basal band of olive-yellow, contrasting with the grey; outermost tail-feathers nearly all grey, and the yellow on the inner webs of each pair of feathers decreasing towards the outermost; an undefined patch of lilac-purple on the smallest wing-coverts; greater wing-coverts and secondaries boldly edged with yellow, forming a conspicuous bar; primary coverts and quills dark

brown or blackish edged with yellow, the innermost changing to the same colour as the back; breast pure yellow; lower breast, flanks and abdomen grey; centre of abdomen, vent and thighs yellow with deep green-grey centres and pale whitish fringes; under tail-coverts purple-chestnut with white subterminal bands; under aspect of tail grey with a broad basal black band concealed by the tail-coverts.

Colours of soft parts. Iris pink to bright crimson with an inner ring of blue; bill very pale bluish- or greenish-white, the cere more strongly tinged with this colour; lower mandible sometimes darker at the base; legs and feet bright chrome-yellow, sometimes nearly orange-yellow.

Measurements. Total length about 330 to 350 mm.; wing 184 to 200 mm.; tail 110 to 118 mm.; culmen 19 to 19·5 mm.; tarsus about 25 to 26 mm.; females are rather smaller, wing 180 to 186 mm.

Female. Generally slightly duller than the male, with the purple wing-patch less pronounced.

Young males are like the adult but without the lilac-purple wing-patch.

Distribution. The base of the Himalayas from Oudh to Eastern Assam as far West as the Jumna; South it occurs rarely in Central India and Northern Orissa, whilst it is extremely common in Bengal and Behar. In Southern Assam—*i.e.*, Cachar, Sylhet, the Naga Hills and North Cachar Hills—we still get this race but individuals show an approach to the next, *viridifrons*, and occasionally a bird is nearer to that form than to true *phœnicopterus*.

Nidification. The Bengal Green Pigeon breeds from early March to the end of July and probably sometimes has two broods. The nest is the typical Dove's nest of small twigs laid criss-cross over one another with very little interlacing. It is generally placed in small trees and saplings on horizontal boughs or branches not very high from the ground, though Mango-trees form favourite sites and when in these the nests may be as high up as fifty feet. Several pairs often build close together and Inglis records three nests on one tree. Two eggs are laid, as is usual with all Pigeons and Doves, but Inglis once took three from a nest and, rarely, one egg only is incubated. They are a pure shining white, the surface smooth but not with the hard gloss of Woodpeckers' eggs, whilst in shape they are broad ovals, almost elliptical. One hundred eggs average 31·8 × 24·4 mm.: maxima **35·0 × 26·1** mm.; minima **28·4 × 22·6** mm. The birds are very close sitters and when incubation is advanced will sit until almost handled. Incubation probably takes thirteen to fourteen days. The display of the Green Pigeons, except that it takes places on trees and not on the ground, is similar to that of all other Pigeons and Doves. The cock bird puffs out his throat and breast,

lowers his wings and ruffles his feathers and then prances solemnly up and down a branch, bowing his head and whistling softly all the time. The female sometimes ignores him and sometimes in response indulges in a similar step-dance to his.

Habits. Typically the birds of this genus frequent open but well-wooded country and are common in gardens, even in big towns, or round about villages. Occasionally they may be found in the interior of deep forest, lured into them by the abundance of some favourite fruit; in the same way they keep normally to the plains and foot-hills, yet have been killed at 4,000 feet feeding on ripe *fici*. Green Pigeons of all kinds seem to have regular roosting-grounds occupied for this purpose only and they flight regularly mornings and evenings to and from these grounds either in small or large flocks, according to their numbers in the district concerned. Whilst thus flighting they form admirable shooting, for the pace at which they travel is very great and they have a disconcerting habit of suddenly altering the height of their flight so that it requires a good shot to make sure of a decent bag. For the table they are excellent, especially if skinned before being cooked. Their notes are most beautiful soft whistles, very much like a human whistle with no defined tune yet full of melody. They feed on all kinds of fruit, especially those of the various Fig-trees. They also eat grain, some buds and shoots, and I have seen them eating maize, climbing about the stalks rather like parrots.

(1827) Crocopus phœnicopterus viridifrons.

THE BURMESE GREEN PIGEON.

Treron viridifrons Blyth, J. A. S. B., xiv, pt. 2, p. 849 (1845) (Tenasserim).
Crocopus phœnicopterus. Blanf. & Oates, iv, p. 5 (part.).

Vernacular names. *Ngu Bommadi* (Burmese); *Daorep gadeba* (Cachari); *Inruigu* (Naga).

Description. Similar to the preceding bird but with the yellow of the forehead more extensive and brighter; the cheeks and ear-coverts also more yellow and less grey; the rump is more grey, contrasting more strongly with the yellow base to the tail.

Colours of soft parts and **Measurements** as in the preceding bird.

Distribution. From Chittagong and Manipur on the West, throughout Burma as far South as Moulmein and East into Siam, where it grades into *C. p. annamensis* of Annam and Cochin China.

Nidification. Exactly like that of the Bengal Green Pigeon. Twenty-four eggs average 31·8×23·8 mm. Oates and Bingham found this Pigeon breeding in Pegu in March and April and

Harington took eggs in upper Burma in the latter month. A native collector working for me took numerous nests in Pegu during June.

Habits. This, like the Bengal race, is a bird of the plains and lower hills up to about 2,000 feet, keeping to open well-wooded country. In all other respects its habits, voice, flight, etc., are identical with those of that bird.

(1528) Crocopus phœnicopterus chlorogaster.

THE SOUTHERN GREEN PIGEON.

Vinago chlorogaster Blyth, J. A. S. B., xii, pt. 1, p. 167 (1843) (Indian Peninsula).
Crocopus chlorogaster. Blanf. & Oates, iv, p. 6.

Vernacular names. *Harial* (Hind.); *Pacha gawa* (Tel.); *Pacha pora* (Tam.).

Description. Differs from the two preceding races in having the breast and abdomen unicoloured yellowish; the forehead either shows no green at all or has merely a narrow line at the edge of the bill; there is no basal band of yellowish-green at the base of the tail, though Northern birds near the range of the Bengal Green Pigeon show traces of this.

Colours of soft parts and **Measurements** as in the other races.

Distribution. Ceylon and the whole of Southern India South of the Bengal race. It extends West to Rajputana and Central Punjab; North-East it is found to Northern Orissa and the United Provinces and to South Behar. In Lucknow, United Provinces, this is the most common form but many birds are somewhat intermediate between the Southern and Bengal races.

Nidification. Similar to that of the other races, though Blewitt records finding nests lined with a little straw, leaves and feathers. The breeding-season is from the end of March to the middle of May, some birds laying as late as the middle of June. Thirty eggs average 31·6 × 24·7 mm.: maxima **34·1 × 25·3** mm.; minima **30·0 × 22·6** mm.

Habits. The same as those of the other races. They flight to feeding-grounds in Mysore in immense densely-packed flocks, Taylor recording eleven and seven birds falling to a right and left at the same flock.

Genus **DENDROPHASA**.

Dendrophasa Gloger, Gem. Hand- u. Hilfsb. d. Naturgesch., p. 329 (1842).

Type, *Columba aromatica* Gmelin.

This genus differs from *Crocopus* in having the primaries blunt

and not strongly attenuated; the third primary is always strongly scalloped in the centre of the inner web; the ramphotheca is always remote from the forehead, generally occupying not more than half the length of the bill; the tail is very slightly graduated. Sexes not alike.

Key to Species.

A. Middle tail-feathers green; mantle of males maroon.
  a. Head and neck of male green or grey, not red; tibial plumes in both sexes buff or yellowish ..... *D. pompadora*, p. 185.
  b. Head and neck of male cinnamon-red; tibial plumes bright yellow ..... *D. fulvicollis*, p. 189.
B. Middle tail-feathers slaty-grey; mantle of males not maroon.
  c. Outer tail-feathers with a broad grey tip exceeding 13 mm. ..... *D. bicincta*, p. 190.
  d. Outer tail-feathers with a narrow grey tip under 10 mm. ..... *D. vernans*, p. 194.

Dendrophasa pompadora.

Key to Subspecies.

A. Lower tail-coverts cinnamon or whitish.
  a. Forehead yellow ..... *D. p. pompadora*, p. 185.
  b. Forehead and crown grey.
    a'. Grey nape contrasting with green hind-neck ..... *D. p. phayrei*, p. 186.
    b'. Grey nape grading into green hind-neck ..... *D. p. affinis*, p. 188.
B. Lower tail-coverts dark green with yellowish tips ..... *D. p. chloroptera*, p. 188.

(1829) Dendrophasa pompadora pompadora.

THE POMPADOUR GREEN PIGEON.

Columba pompadora Gmel., Syst. Nat., i, p. 755 (1788) (Ceylon).
Osmotreron pompadora. Blanf. & Oates, iv, p. 9.

Vernacular names. *Batgoyā*, *Sipaduwā* (Cing.); *Puchai-pavā* (Tam.).

Description. Forehead, lores and sides of the head greenish-yellow, turning to green on the crown, nape and neck; sometimes an indication of a grey patch on the crown; hind-neck and upper back green, well defined from the maroon-chestnut of the back, scapulars and lesser wing-coverts; lower back, rump and upper tail-coverts green, rather more yellowish than on the back; central tail-feathers green, practically concolorous with the coverts, each succeeding pair of feathers becoming blacker until

the outermost are black, all but the median pair with a broad band of grey at the tips; median and greater wing-coverts black, fading to grey on the inner webs, the median with broad and the greater with narrow edges of yellow; quills black, becoming grey on the inner webs, the primaries with yellowish-white edges and the secondaries with broader yellow edges; the innermost secondaries suffused with maroon and with very broad edges of yellow; chin and throat lemon-yellow; upper breast creamy-orange, occasionally tinged with vinous or pink; lower breast, abdomen and flanks greenish, the posterior flanks and vent splashed with yellow; vent and under tail-coverts pale buffy-white; axillaries and under wing-coverts grey, tinged with green.

Colours of soft parts. Iris carmine-red with an inner ring of cobalt; bill glaucous-green, paling to bluish at the tip; eyelids glaucous-green; legs and feet purple-red.

Measurements. Total length about 240 mm.; wing 138 to 147 mm.; tail 78 to 100 mm.; culmen about 15 to 16 mm.; tarsus about 15 mm.

Nidification. This Green Pigeon breeds from March to June, more rarely on to August, making the usual fragile platform of twigs to serve as nests, placed in high bushes or small trees in forest and jungle. A favourite site is the scrub-jungle and forest near villages. Two is the normal full clutch of eggs but Wait says one only is often laid. A series of twenty-two eggs average 28·7 × 22·6 mm.: maxima **31·1** × 22·9 and 28·5 × **23·3** mm.; minima **27·5** × 21·6 and 28·2 × **20·7** mm.

Habits. A forest and jungle bird found from the sea-level up to about 4,000 feet. Like all other Green Pigeons they are almost entirely frugivorous, are very greedy and rather quarrelsome birds when feeding, allowing a close approach of human beings when so engaged, though shy and wary at other times. They collect in flocks of a dozen to a hundred or more and are very swift on the wing, fairly active when climbing about the branches of trees but never descend to the ground. They have the usual sweet whistle of the subfamily, constantly uttered as they clamber from branch to branch in search of fruit.

(1830) Dendrophasa pompadora phayrei.

THE ASHY-HEADED GREEN PIGEON.

Osmotreron phayrei Blyth, J. A. S. B., xxxi, p. 344 (1862) (Tounghoo); Blanf. & Oates, iv, p. 8.

Vernacular names. *Daorep* (Chachari); *Inruigum* (Naga); *Vohpolip* (Kuki); *Chota Haitha* (Assam); *Chota Harial* (Sylhet); *Ngu* (Burma); *Chota Harial* (Bengali).

Description. Differs from the preceding bird in having the whole nape and crown grey, the forehead alone tinged with yellowish-green; the sides of the head are darker and the chin and throat more green, less yellow; the feathers of the vent and

the under tail-coverts are cinnamon, the former marked with yellow.

Colours of soft parts. Iris pink with an inner ring of pale blue; orbital skin bluish or pale slate-grey; bill bluish-white, the base somewhat darker and lower mandible still paler; legs lake-red, the hinder part paler, the scales showing whitish edges in old birds.

Measurements. Wing, ♂ 143 to 165 mm., ♀ 145 to 160 mm. Weight generally 4 to 5 ounces, in exceptional cases as much as 7 ounces.

Distribution. Lower Bengal South to Calcutta; North and Eastern Bengal to Assam; the greater part of Burma as far South as Tenasserim and East to Cochin China.

Nidification. This little Pigeon breeds in immense numbers in Assam from early in March to the end of June, a few birds having second nests in July and August. In Burma March and April seem to be the principal months for eggs, whilst in Bengal the few records available show that it breeds after the rains break in July. It may be found from the plains up to 4,000 feet and, very rarely, up to 5,000 feet but is most common below 3,000 feet. The nests are the flimsiest constructions, put together by both birds working in concert in three to five days. The male seems to do all the collecting whilst the female does the actual building. The nests may be placed in bamboo clumps, bushes, saplings or even big trees but these are always in forest or jungle of some kind, secondary growth in deserted cultivation being a very favourite site. Whilst the hen sits, the cock bird spends much of his time on a branch close by, whistling to her and sometimes giving a little crooning coo much like the lowest notes of a dove. Two eggs are always laid and two hundred of these average 27·5 × 21·8 mm.: maxima **30·5** × 22·2 and 30·1 × 24·1 mm.; minima **25·9** × 22·2 and 27·4 × **20·3** mm.

Habits. Similar to those of the preceding bird. This Green Pigeon is the most numerous of all pigeons in Assam and forms the bulk of those shot in the pigeon-shoots in that province, as many as three hundred being sometimes shot in a day. They are most excellent birds for the table, so that not a bird shot is wasted. Like other Green Pigeons they sleep during the great heat of the day, feeding from daybreak to about 11 A.M. and again from about 3.30 P.M. until dusk, when the flocks wend their way back to their usual roosting-place. When drinking, which Green Pigeons seem to do regularly morning and evening, they prefer such forest streams and pools as have growth all round them, which they can clamber down and so drink from the surface of the water. Most flocks of these pigeons number only one to three dozen, but I have seen others of fully three hundred. They have the usual soft whistle of the genus and are entirely frugivorous, swallowing with ease small *fici* and other berries nearly as large as their own heads.

(1831) Dendrophasa pompadora affinis.

THE GREY-FRONTED GREEN PIGEON.

Vinago affinis Jerdon, Madr. Jour. L. S., xii, p. 13 (1840) (Malabar Coast).
Osmotreron affinis. Blanf. & Oates, iv, p. 8.

Vernacular names. *Podo-putsa-guwa* (Tel.).

Description. Similar to *p. phayrei* but deeper-coloured on the upper parts, the chestnut-maroon being almost purple; the orange on the breast is faint or absent; the grey of the head is darker and duller, merging into the green of the hind-neck, instead of being distinctly divided therefrom. In the male the shoulder of the wing is blacker and not mixed with grey.

Colours of soft parts. "Iris blue with an outer ring of pink or lake-red; the soft basal part of the bill is glaucous-green, but the tips of both mandibles are ashy" (*Fairbank*). "Legs and feet lake-pink; claws bluish-white" (*Davison*).

Measurements. Wing 138 to 150 mm.

Distribution. West coast of India from Kanara to Cape Comorin. Kinloch found it very common in the Nelliampathy Hills. Jerdon records it from Central India and the Eastern Ghats and it has occurred in the Laccadives.

Nidification. Similar to that of the other races, nesting in small trees between 6 and 20 feet from the ground, the male assisting as usual in incubation. Twenty eggs average 28·0 × 21·8 mm.

Habits. Those of the species. It seems to be a strictly forest-bird and everywhere common along the whole coast. It is found up to at least 3,000 feet and possibly a good deal higher.

(1832) Dendrophasa pomadora chloroptera.

THE ANDAMAN GREEN PIGEON.

Treron chloroptera Blyth, J. A. S. B., xiv, p. 852 (1840) (Nicobars).
Osmotreron chloroptera. Blanf. & Oates, iv, p. 10.

Vernacular names. None recorded.

Description. Differs from *p. phayrei* in having the lesser wing-coverts green, darker and less yellow than the neck; green of the upper parts more yellow except on the central rectrices; the maroon is as dark as it is in *p. affinis* but it differs from this and all the other races in its dark green under tail-coverts merely tipped with yellowish; the forehead is a pure grey.

Colours of soft parts. Iris, first ring pale blue, second ring darker blue and third ring fleshy-buff; bill whitish-blue or leaden-blue tinged with green near the base; cere plumbeous; legs carnation-pink or purple-pink; orbital skin plumbeous, yellowish next the eye. (From Davison's notes.)

Measurements. Wing 171 to 183 mm. Weight ·75 lb. (*Davison*).

Distribution. Andamans and Nicobars. I cannot separate Richmond's *Osmotreron chloroptera andamanensis* as, in a large series, his supposed distinguishing characters prove to be individual.

Nidification. Unknown.

Habits. Those of the species.

(1833) Dendrophasa fulvicollis fulvicollis.

THE CINNAMON-HEADED GREEN PIGEON.

Columba fulvicollis Wagler, Syst. Av., sp. 8 (1827) (Sumatra).
Osmotreron fulvicollis. Blanf. & Oates, iv, p. 10.

Vernacular names. *Punai bakau* (Malay).

Description.—Adult male. Head, neck and upper breast cinnamon, above darker and tinged with purple, below paler and more yellow, changing to orange-ochre on the lower breast; interscapulars, scapulars, back and lesser wing-coverts purple-maroon; rump slate changing into olive-green on the upper tail-coverts; central tail-feathers above dull olive-green, the others olive-grey with a pure grey terminal band and a subterminal black one; primaries black with narrow margins of yellowish-white on the outer webs and ends of inner webs; greater and median coverts, winglet and secondaries black with yellow margins broadest on the inner secondaries and the innermost of these latter suffused with green; abdomen mixed yellowish-green and grey; flanks dark dove-grey, becoming deep slate posteriorly; tibial plumes and vent bright yellow, much mixed with slate; under tail-coverts cinnamon, the longest with green centres; axillaries and under wing-coverts French-grey.

Colours of soft parts. "Iris buffy-pink; legs and feet purplish-pink, claws white; lower mandible to angle of gonys and upper mandible to just beyond nostril deep red, rest of bill dead white strongly tinged with greenish-blue; naked space round eye plumbeous-green" (*Davison*). Edges of eyelid orange.

Measurements. Length about 270 mm.; wing 136 to 149 mm.; tail 85 to 96 mm.; tarsus about 21 mm.; culmen about 16 mm.

Female. Has the cinnamon and maroon of the upper parts replaced by dull olive-green and below by pale yellowish-green, more or less mixed with grey on the abdomen; the crown is wholly grey with distinct green supercilia; the chin in some individuals has a faint rufous tinge; under tail-coverts pale buff centred with green.

Colours of soft parts. "Iris with an outer ring of pink and an inner ring of ultramarine. The legs and feet are paler and pinker than in the male" (*Davison*).

Measurements as in the male.

Young males are like the females, assuming the fully adult plumage in two moults.

Distribution. Tenasserim, South to the Malay States and Malay Archipelago to Sumatra; Cochin China?

Nidification. Butler found this Pigeon breeding at Pahang in May, taking two eggs from a nest in a small tree on the Pahang River. Kellow took eggs near Simpang in January and February and again in May and June. The nests were generally built in small saplings in forests on the banks of streams. Ten eggs average 28·4 × 21·7 mm.

Habits. The Cinnamon-headed Green Pigeon was thought to be migratory, only entering our limits in Winter *, but probably they merely retire in Spring to deeper forest to breed, though during the cold months they are found on the outskirts of forest and in the more open country. In all their ways, food, flight and voice they resemble other Green Pigeons. They are said to always keep in small flocks even where most numerous, though several flocks may collect in the same feeding-ground. Davison found them feeding on low bushes, about two feet high, bearing fruit rather like red currants.

Dendrophasa bicincta.

The question as to the geographical range for this species has been difficult to determine as it cannot be certain which specimen constituted Jerdon's type. The type-locality is Madras but there are three specimens of Jerdon's in the British Museum, two labelled "Madras" and one labelled "India." In writing my 'Indian Pigeons and Doves' I excluded this last specimen from my consideration but Robinson has since ascertained that it was obtained at Tellicherry on the Malabar coast. It is a very big bird, with a wing of about 160 mm. Of the other two specimens one is rather small and the other very small but this last was collected by Baber, who did much collecting in Ceylon, so that the locality on the label, not in Baber's handwriting, may be wrong. My reasons, therefore, for disagreeing with Hartert in naming the Ceylon bird *leggei* and retaining the name *bicincta* for the Continental bird are not good and I now agree with him. Robinson's *prætermissa* must also be admitted, the excellent material brought home by him showing it to be distinguishable from the Indian race.

Key to Subspecies.

A. Larger; wing over 150 mm.
  a. Darker and more green ..... *D. b. bicincta*, p. 191.
  b. Lighter and more yellow ..... *D. b. prætermissa*, p. 193.
B. Smaller; wing under 150 mm. ..... *D. b. leggei*, p. 192.

* In N. Borneo it is definitely stated to migrate with the monsoons.

(1834) Dendrophasa bicincta bicincta.

THE INDIAN ORANGE-BREASTED GREEN PIGEON.

Vinago bicincta Jerdon, Madr. J. L. S., p. 13 (1840) (Madras).
Osmotreron bicincta. Blanf. & Oates, iv, p. 11 (part.).

Vernacular names. *Chitta-putsa-guwa* (Tel.); *Harial* (Hind.); *Haitha* (Assam).

Description.—Adult male. Forehead, lores and crown to the eye dull yellowish-green changing to blue-grey on the nape, hind-neck and upper back and then again into brownish-green on the back, scapulars, rump, upper tail-coverts and smaller wing-coverts; these last are rather less and the upper tail-coverts rather more brown than the other parts; tail dark ashy-grey with a broad terminal band of pale grey and a dark, almost black, subterminal band, narrowest and least defined on the central feathers and broadening outwardly; median wing-coverts green with broad yellow borders to the outermost; greater coverts black with broad yellow edges; primaries and outer secondaries black, the



Fig. 27.—Head of *D. b. bicincta.* ½.

former narrowly, the latter broadly edged with yellow; the inner secondaries more green, the innermost almost the same as the back; chin, throat and fore-neck green, the centre of the chin and throat yellow; a broad band of lilac across the breast, followed by a second broader band of deep orange; lower breast pale yellowish-green, becoming bright yellow on the abdomen; tibial plumes yellow, splashed with dark green and grey; under tail-coverts cinnamon, the outer and longest edged with pale yellow.

Colours of soft parts. Iris with two rings, the inner ring bright ultramarine to deep blue, the outer pink to crimson; bill pale blue or pale green, the basal half darker and brighter; legs and feet coral-red to deep crimson-red, the soles paler and the claws horny-brown; eyelids and orbital skin bright lavender-blue.

Measurements. Total length about 280 to 300 mm.; wing 153 to 164 mm. (once 170 mm.); tail 91 to 110 mm.; tarsus about 23 to 25 mm.; culmen about 12 to 13 mm.

Female. Has no lilac and orange bands across the breast; the blue-grey of the upper parts is duller and less in extent; the under tail-coverts are pale dull cinnamon, much mottled with greenish on the inner webs; the colours of the soft parts are the same but duller than in the male.

Young birds are like the female but duller and darker. The iris is pale watery-brown.

Distribution. The Malabar Coast, perhaps excluding the South of Travancore, whence the birds are very small and nearer *leggei*; Bombay Presidency; Northern India from the United Provinces along the Terai through the foot-hills and adjoining plains to Eastern Assam, North of the Brahmapootra; Bengal and Behar but replaced in the extreme East—*i. e.*, Assam, South of the Brahmapootra, Commilla and Chittagong—by *prætermissa*. I obtained it in Chota Nagpur, where, however, it must be very rare and probably only a Winter visitor and it is more common in Manbhum, Puralia and adjoining Eastern districts.

Nidification. There is practically nothing on record about the breeding of this race of Orange-breasted Green Pigeon. Blyth once took a nest with two eggs in the Botanical Gardens, Calcutta; Hodgson says it breeds in Nepal from April to July, whilst Coltart and I took numerous nests in Upper Assam. In the latter district the birds build in bamboo clumps, high bushes and small trees either in forests or on the outskirts of these and only rarely in the open country. The nests are of the usual type and the eggs, two in number, like those of the rest of the family. The only ten eggs I have measured average 28·6 × 23·0 mm.: maxima 30·2 × 23·9 mm.; minima 27·7 × 21·0 mm.

The breeding-season lasts from the end of March to August and many birds have two broods.

Habits. This Green Pigeon is essentially a bird of forest-country where there is a heavy rainfall and, as Hume points out, is never found in the more dry and arid districts. It is usually found in rather small flocks of half-a-dozen to twenty birds and I have never seen it in the huge flocks some of the Green Pigeons affect. Odd birds or pairs are often met with and at other times one or two will mingle with flocks of other species. Like all other Green Pigeons they are practically entirely frugivorous, their one unusual item of diet being termites. Voice and flight are indistinguishable from those of other birds of the genus.

(1835) Dendrophasa bicincta leggei.

THE CEYLON ORANGE-BREASTED GREEN PIGEON.

Treron bicincta leggei Hartert, Nov. Zool., xvii, p. 193 (1910) (Ceylon).

Osmotreron bicincta. Blanf. & Oates, iv, p. 11 (part.).

Vernacular names. *Chitta putsa guwa* (Tel.); *Patcha-praa* (Tam. in Ceylon); *Batta-goya* (Cing.).

Description. Sex for sex like the typical form but decidedly smaller. Perhaps also on an average Ceylon birds are rather darker and brighter than those from the continent of India.

Colours of soft parts as in the preceding bird.

Measurements. Wing 140 to 146, one 149 mm.

Distribution. Ceylon. Birds from South Travancore are very small and seem referable to this race. Stewart obtained many but there are unfortunately no specimens from Travancore in the British Museum.

Nidification. The principal laying months of this Green Pigeon in Ceylon seem to be January to March but both Legge and Wait took eggs in August. It possibly breeds twice in the year. The nest is like that of the genus but Layard says that he found a nest lined with roots. It builds in forests and also in well-wooded country close to them and seems to prefer large trees as sites for its nest, though seldom selecting boughs above twenty feet or so from the ground. Twelve eggs average 27·7 × 21·3 mm.: maxima **28·9** × 20·4 and 27·8 × **22·0** mm.; minima **27·8** × **20·4** mm.

Habits. An extremely common bird in Ceylon, associating in small flocks, which collect together in vast numbers when certain trees are in fruit. They are said to be very partial to dates, eating them until they almost burst their crops. Legge says that its usual note is a harsh croak but that it is a very silent bird. It has the usual beautiful whistling call of the genus. It is found practically throughout the plains as well as in the lower hills.

(1836) Dendrophasa bicincta prætermissa.

THE SIAM ORANGE-BREASTED GREEN PIGEON.

Treron bicincta prætermissa Rob. & Kloss, Journ. F.M.S. Mus., x, p. 203 (1921) (Koh Lak, S.W. Siam).
Osmotreron bicincta. Blanf. & Oates, iv, p. 11 (part.).

Vernacular names. *Gnu* (Burm.); *Daorep-kashiba* (Cachari); *Inrui-gahergu* (Naga); *Haitha* (Assam).

Description. Only differs from *D. b. bicincta* in being somewhat more yellow and brightly coloured, hardly sufficiently so to enable one to differentiate it as a subspecies. The female, however, has usually more grey on the nape.

Colours of soft parts and **Measurements** as in the Indian bird.

Nidification. In Assam this Green Pigeon breeds from April to June, many birds earlier and a few even later, doubtless the majority having two broods. They breed in Burma from March to May, occasionally in February. The nest is built on bushes, small and large trees, or bamboo-clumps, generally not more than six to ten feet from the ground, more rarely at considerable heights. The birds prefer evergreen forest for nesting

purposes, though they select sites near streams, paths or similar open spaces. At other times they place their nests on trees in the open or in the scrub round about villages. The number of eggs laid is two as usual and 200 average 29·5 × 22·8 mm.: maxima 31·5 × 23·5 mm.; minima 27·3 × 21·6 mm. The birds sit very close, especially the male, who seems to do most of the incubation and who has sometimes to be almost pushed off the nest. Incubation takes 13 or 14 days. They breed in the plains and also in the hills up to at least 4,000 feet and possibly rather higher.

Habits. Those of the species.

Dendrophasa vernans.

Columba vernans Linn., Mant., p. 526 (1771).

Type-locality: Philippines.

The typical form differs from that found in Sumatra and Malay Peninsula to Tenasserim in being rather larger on an average; the forehead is more yellow and the pale tip to the tail is broader and paler.

(1837) Dendrophasa vernans griseicapilla.

THE MALAYAN PINK-NECKED GREEN PIGEON.

Treron griseicapilla Schleg., N. T. D., i, p. 70 (1863) (Sumatra).
Osmotreron vernans. Blanf. & Oates, iv, p. 13 (part.).

Vernacular names. *Ngu* (Burmese); *Punai* (Malay).

Description.—Adult male. Head and throat grey, occasionally tinged with green on forehead and throat; neck all round purple-lilac, mixed with grey next the back; back, scapulars, lesser and median wing-coverts and innermost secondaries green, the median coverts broadly edged with lemon-yellow; greater coverts green with broad yellow edges; winglet primary coverts and primaries black, the outer three or four of the latter narrowly edged with pale yellow; rump green, changing to a bronze-tan on the upper tail-coverts; tail grey, with a broad subterminal band of black, narrow on the central feathers and thence broadening to the outermost; a broad patch of orange covering the whole breast; abdomen yellowish-green faintly splashed with grey on the sides; tibial plumes and vent dark green with broad yellow edges; flanks mixed grey and green; under tail-coverts deep chestnut, sometimes with a blackish patch near the tips of the longest; under wing-coverts and axillaries grey.

Colours of soft parts. "Iris pink; feet light lake; bill plumbeous, nail whitish, cere and edge of gape green; weight about 6 ozs." (*Davison*).

"Irides with three rings, the outer buff or pink, the next Prussian blue, the inner ultramarine" (*Davison*).

Measurements. Total length about 280 mm.; wing 135 to 155 mm.; tail about 98 to 110 mm.; tarsus about 21 to 23 mm.; culmen about 15 mm.

Female. Whole head, neck and breast olive-green, varying considerably in depth in different individuals; under tail-coverts pale yellowish-buff, suffused with cinnamon and freckled with dull brownish-green on the shortest.

The female has a wing between 133 and 152 mm.

The young male is like the female but has a greener tail.

Nidification. Davison obtained a nest of this species with eggs on the 12th June; Major R. Baker found it breeding from March to June in Singapore. Eggs have been sent me from Perak taken in March, whilst Hopwood took eggs in November on the Little Tenasserim River. Sixteen eggs average 27·4 × 21·6 mm.: maxima 28·8 × 22·3 mm.; minima 26·3 × 21·4 and 27·4 × 20·3 mm.

They apparently breed both in forests, selecting thick thorny bushes and small trees as sites for their nests, and also in the mangrove-swamps along the shore.

Habits. Those of the species. This bird over the greater part of its range seems to be the most common of all the Green Pigeons and in many places big bags are made as they flight to and from their roosting-places in the mangrove-swamps. They associate in small flocks during the day but roost together in enormous numbers. Davison says that they have a "soft low whistle ending in a sort of 'coo,' very unlike *D. chloroptera*, *malabarica*, etc." In habits he says it closely resembles *Treron nepalensis*.

Genus **TRERON**.

Treron Vieill., Analyse, p. 49 (1816).

Type, *Columba curvirostra* Raffles.

The genus *Treron* forms a link in the chain with *Dendrophasa* and *Butreron*. The rhamphotheca in *Treron* reaches the forehead, not having the basal half of the bill covered with a soft cere as in *Dendrophasa*. There is wide naked space round the eye and the colour of the base of the bill and gape is a brilliant red, distinguishing this Green Pigeon at a glance from all its Indian allies; the wing is long, the primaries very slightly pointed and the third primary deeply and widely scalloped on the inner web; the under tail-coverts are long and the tail itself very slightly rounded.

Only one species is known, two races of which, *T. c. curvirostra* and *T. c. nepalensis*, extend through the greater part of our area to the Indo-Chinese countries and Malay States etc.

Treron curvirostra.

Key to Subspecies.

A. Smaller and darker ..... *T. c. curvirostra.*
B. Larger and lighter ..... *T. c. nipalensis*, p. 196.

(1838) Treron curvirostra nipalensis.

THE THICK-BILLED GREEN PIGEON.

Toria nipalensis Hodgs., As. Res., xix, p. 164 (1836) (Nepal).
Treron nepalensis. Blanf. & Oates, iv, p. 14.

Vernacular names. *Daorep-buku-gajao* (Cachari).

Description.—Male. Forehead and lores grey, darker on the crown and becoming olive-green on the nape and neck; scapulars, interscapulars, back and lesser wing-coverts chestnut-maroon, palest and suffused with grey where the maroon meets the green neck; rump and upper tail-coverts olive-green, brightest and tinged with yellow on the latter; central rectrices olive-green, the outer grey with a band of black across the middle, widening outwardly; the two pairs of tail-feathers next the central more or less tinged with green; quills black, the two outer primaries narrowly edged with yellowish-white; innermost secondaries and a few coverts next the maroon, green; remaining coverts black with broad yellow margins to the outer webs; cheeks, ear-coverts, sides of chin and throat, breast and lower plumage olive-green; centre of chin and throat more yellow; posterior flanks, thighs and vent darker olive-green mixed with white; under tail-coverts cinnamon, the external ones marked with green and white.

Colours of soft parts. Iris, inner ring deep blue, outer ring golden-yellow to orange-red; orbital skin vivid verdigris-green; bill pale yellowish, greenish or leaden-white, the tip darker and greener, the base and round gape brilliant coral-red; legs and feet deep lake-pink to coral-red.

Measurements. Wing 124 to 146 mm.; tail 84 to 95 mm.; tarsus about 18 to 19 mm.; culmen about 14 to 15 mm.

Female. Has the maroon of the upper plumage replaced by olive-green; the under tail-coverts are dull buff with olive-green bars on the longest and olive-green bases to the shorter.

Young males resemble the females but get a little maroon on the upper parts at the first moult. The whole plumage of the young at first is very grey and dull. The iris is pale grey-brown, the orbital skin livid grey and the basal portion of the bill dull pink.

Distribution. The extreme West of Nepal to East and South Assam, Eastern Bengal; Burma to the South of Tenasserim; Shan States, Yunnan, Annam, Siam and Cochin China.

Nidification. Whymper took numerous nests of this Pigeon during May on the borders of W. Nepal and Garhwal and thence it breeds throughout its range, principally in May and June but sometimes as early as March and often as late as August. They build their nests either in bushes or small trees in forest, in bamboo-clumps in mixed or bamboo-jungle and sometimes in single bushes or clumps standing in the open. Twice I have had them breeding in orange-groves round my garden. Nests and eggs are quite typical, two hundred averaging 28·7 × 22·6 mm.: maxima **30·0** × 22·0 and 28·3 × **23·2** mm.; minima **25·9** × 20·8 and 26·0 × **20·0** mm.

They breed from the level of the plains up to at least 5,000 feet and possibly higher and, like all the family, are very close sitters.

Habits. This is a very common Pigeon all through Assam, Manipur, Lushai Hills and Northern Burma and in the first-named place always forms a conspicuous portion of the bigger bags made in forest. Their habits, flight, voice and diet are those of the subfamily but they are even more quarrelsome birds than most Green Pigeons, though their language and posturing are more fierce than their actual blows. In addition to the usual whistling notes they have a low guttural "groo-groo," common also to other Green Pigeons but more constantly uttered by this bird. They drink early in the mornings and late in the evenings and roost as a rule in high densely-foliaged trees but occasionally in cane-brakes or in reed-beds. I have frequently seen this little Pigeon on the ground, feeding on wild strawberries and the small red berries of a ground-plant.

Genus **BUTRERON.**

Butreron Bonaparte, Consp. Av., ii, p. 9 (1854).

Type, *Columba capellei* Temm.

In this genus the bill is stouter and deeper even than in *Treron* but the rhamphotheca does not extend quite up to the forehead and though there is a bare space round the eye, it is neither so large or conspicuous as in that genus; the primaries are blunt and not at all attenuated and the third primary is widely, but shallowly, scalloped; the lower tail-coverts are very long.

The genus contains but one species.

(1839) **Butreron capellei.**

THE LARGE THICK-BILLED GREEN PIGEON.

Columba capellei Temm., Pl. Col., pl. 143 (1823) (Java).
Butreron capellei. Blanf. & Oates, iv, p. 13.

Vernacular names. None recorded.

Description.—Male. Whole upper plumage an olive grey-green, the forehead paler and more grey and the back of the neck more yellowish; upper tail-coverts greenish-yellow grading into the still more yellow central tail-feathers, which have brown shafts; outermost feathers dark slate-grey with broad pale grey tips, intermediate feathers grading from one to the other; lesser and median wing-coverts like the back; greater coverts and quills dark slate-grey, the inner coverts narrowly margined bright yellow; inner secondaries paler than the outer, the innermost becoming green like the back, broadly edged with bright yellow; throat and fore-neck pale greenish-yellow; breast bright deep orange, the sides washed with chestnut, remainder of lower plumage oil-green, the feathers of the thigh and vent buff; under tail-coverts deep chestnut-maroon, the shortest buff; under surface of wing dove-grey, the coverts more or less mixed with green; axillaries and flanks greenish-grey.

Colours of soft parts. Iris golden-yellow to deep reddish-brown; bill pale whitish-green, cere and gape green; legs, feet, eyelids and orbital skin yellow.

Measurements. Total length about 400 to 420 mm.; wing 194 to 208 mm.; tail 127 to 146 mm.; tarsus 20 to 23 mm.; culmen 21·5 to 24 mm. Weight according to Davison 17 to 18 oz.

Female has the orange of the breast replaced by golden yellowish-green; the posterior flanks and thighs are darker and more mixed with buff; under tail-coverts buff with dull greenish-brown centres and bases.

The soft parts are all paler in colour and the weight is only about 13 oz.

Distribution. Malay Peninsula, once in Elphinstone Island off the Mergui coast, where it was obtained by Dr. Anderson. Birds from Sumatra, Borneo, Java and other islands have all now been separated under subspecific names.

Nidification. Nothing recorded.

Habits. So far as recorded similar to those of other Green Pigeons.

Genus **SPHENOCERCUS.**

Sphenocercus Gray, List Gen. B., p. 57 (1840).

Type, *Columba oxyura* Reinw.

This genus is distinguished by having the third primary expanded in the middle and not scalloped, this expansion being quite definite in the type-form *oxyurus*, *S. apicaudus* and *S. sphenurus*. In all the other supposed species and subspecies of this genus the third primary is scalloped as in *Dendrophasa* and these birds seem to constitute another genus.

The bill is very like that of *Dendrophasa* but has the rhamphotheca occupying only about one-third of the total length; the tail is graduated and in one species the central tail-feathers are greatly lengthened; the under tail-coverts exceed the outer rectrices in length; an area of bare skin stretches from the base of the bill through the lores and round the eye.

Key to Species.

A. Central tail-feathers acuminated and extending two or three inches beyond the next pair.... *S. apicaudus*, p. 199.
B. Central tail-feathers not acuminate and only a little longer than the next pair ..... *S. sphenurus*, p. 200.

(1840) Sphenocercus apicaudus apicaudus.

THE PIN-TAILED GREEN PIGEON.

Treron apicauda Blyth, J. A. S. B., xiv, p. 854 (1845) (S.E. Himalayas).
Sphenocercus apicaudus. Blanf. & Oates, iv, p. 16.

Vernacular names. *Song-pong* (Lepcha); *Daorep-galao* (Cachari); *Lumberdum Kokhila* (Hind.); *Bor Haitha* (Assam); *Harial* (Bengal Terai); *Ngu* (Burmese).

Description.—Male. Whole head and neck bright yellowish grass-green, paling on the nape and changing to olive-green, washed with grey, in a broad collar on the hind-neck; back, scapulars and wing-coverts grass-green, very faintly vermiculated darker; rump and upper tail-coverts bright greenish-yellow; quills and greater coverts of the wing black, the three outermost primaries narrowly edged yellow; secondaries more broadly edged yellow and innermost secondaries concolorous with the back, very broadly edged with yellow, these yellow borders and tips forming two bold wing-bars; under plumage greenish-yellow; the breast washed with orange-pink, which shades off into the surrounding parts; flanks, lower abdomen and vent much darker and with pale yellow-buff edging to the feathers, varying in extent; under tail-coverts cinnamon, margined outwardly with buffish-white; axillaries mixed green and grey; tail grey, dark above and pale below, the central feathers green or greenish on the narrowed ends; shafts brown above, white below.

Colours of soft parts. Iris, outer ring pale to bright salmon-pink, terra-cotta or carmine-red, inner ring bright pale blue; orbital skin pale livid blue to bright blue; bill pale bluish-horny or greenish-horny, cere and base brighter blue; legs and feet coral-red or lake-red.

Measurements. Total length about 400 to 430 mm.; wing 160 to 175 mm.; tail 220 to 254 mm.; tarsus about 23 to 25 mm.; culmen about 15 to 16 mm. Weight 6½ to 8 oz., according to Cripps sometimes as much as 9 oz.

Females usually have much shorter tails, 150 to 175 mm. Weight 7 oz. or under.

Female is duller everywhere, the grey of the hind-neck is absent or faint; there is no orange on the breast; the under tail-coverts are paler and duller, the outer webs almost entirely white and the centres marked with dull sage-green.

The young male resembles the female but partially acquires the grey neck and orange breast at the first autumnal moult.

Distribution. Throughout the lower Himalayas and the broken country adjacent to them from Kuman to E. Assam, through Burma to Tenasserim. It straggles into the plains of Behar and Bengal and I received one skin from Perak in the Malay Peninsula. Robinson and Kloss have not, however, met with this bird and its occurrence must be abnormal in the Malay States and the skin, in shocking condition, may have been that of *seimundi*.

Nidification. This beautiful Pigeon breeds from the foot-hills of the Himalayas up to some 5,000 feet, less often up to 6,000 and possibly rather higher again both in Sikkim and Nepal. The breeding-season is long, lasting from March to August; whilst many birds have two broods. The nest is the usual platform of twigs and the favourite site is a mass of small branches of saplings, about fifteen to twenty feet from the ground. They prefer fairly deep forest for breeding purposes but in most cases select trees near open glades or river-banks. One hundred eggs average 31·7 × 23·8 mm.: maxima **35·0 × 24·1** and 34·1 × **26·1** mm.: minima **27·6** × 23·0 and 30·7 × **22·1** mm.

Habits. This Pigeon is essentially a bird of the hills rather than of the plains and is resident at all heights up to 6,000 feet throughout the year. Into the plains it makes sudden irruptions but this is due to food-supply only and not to pressure of climate. There is little to record of these birds different to the other genera. They may be rather more persistent climbers and their long tails give them a very parrot-like look when thus employed. They have all the notes of other Green Pigeons and both this and the next species also indulge in a curious chattering. Its flight is straight and steady and extraordinarily swift. Hume considered it a stupid bird because it preferred to seek safety in dense cover rather than take to flight but experience has probably taught them the wisest course to take.

(1841) Sphenocercus sphenurus sphenurus.

THE WEDGE-TAILED GREEN PIGEON.

Vinago sphenura Vigors, P. Z. S., 1831, p. 173 (Darjiling).
Sphenocercus sphenura. Blanf. & Oates, iv, p. 16.

Vernacular names. *Kokla*, *Kokila* (Hind.); *Kaku* (Lepcha); *Gau* (Burmese); *Haintha*, *Bor Haintha* (Assam); *Daorep-gadeba* Cachari); *Kainal* (Pahari, Simla).

Description. Head and neck yellowish-green, the crown tinged with rufous-orange; the green of the hind-neck passing into olive-grey on the upper back and from that again into maroon on the scapulars, interscapulars, back and lesser wing-coverts; lower back, rump, upper tail-coverts, the remaining wing-coverts and inner secondaries olive-green; the median coverts often edged or suffused with maroon in old birds; greater coverts narrowly edged with yellow on the outer webs; quills black or blackish-grey, the second to fourth primary very finely edged with yellow; the secondaries gradually changing from black to green, the outer with fine yellow edges to the outer terminal halves; central rectrices green like the lower back, the outermost dark grey washed with green, those between grading from one to the other; chin and throat yellow; breast washed with orange-pink; lower breast and abdomen greenish-yellow; flanks and thighs dark green with broad yellow margins; vent pale yellow; short outer tail-coverts yellow and green, the longer pale dull cinnamon with narrow dull green centres and shafts; under wing-coverts and axillaries grey, the latter mixed with green.

The maroon on the upper parts varies greatly in extent.

Colours of soft parts. Iris, inner ring bright pale ultramarine, outer buffy-pink to bright crimson; orbital skin pale lavender or smalt-blue; bill pale dull smalt-blue or greenish-blue, the tips and cere brighter and more blue; legs coral-red to pure deep crimson.

Measurements. Wing 173 to 185 mm.; tail 114 to 139 mm.; tarsus 16·5 to 19 mm.; culmen about 16·5 to 19 mm.

Female like the male but with no rufous on the crown and no maroon on the upper plumage; the under tail-coverts are pale ochre with green centres and white shafts.

Young birds are like the female but duller and darker.

Distribution. Kashmir, Kuman, Garhwal Hills to Assam, Burma, Shan States to Tenasserim.

Nidification. The breeding-season appears to be April to June, a few birds having second broods in July and August. They breed certainly up to 8,000 feet and down to some 2,000 feet or even lower, but they are most numerous between 3,500 and 5,000 feet. Except that they often select lofty situations for their nests in high trees and keep more exclusively to forest there is nothing in their nidification different to that of the preceding bird. Two hundred eggs average 31·5 × 23·1 mm.: maxima **33·8** × **24·4** mm.; minima **28·0** × **22·0** mm.

Dodsworth gives the period of incubation as 18 days; I had estimated it as 13 to 14 days.

Habits. Very similar to those of the Pin-tailed Green Pigeon but it is more entirely a forest-bird. In the West of its range it appears to be migratory, leaving many places during the non-breeding-season. In the East, Assam etc., it is resident all the year round, nor do its numbers fluctuate much, though the birds

wander in the coldest months into the plains. Their whistling is the sweetest and fullest of all the Green Pigeons and for this reason they are very favourite cage-birds.

Subfamily DUCULINÆ.

This subfamily contains a number of very large Pigeons which somewhat approach the Green Pigeons in their habits generally but in their anatomical characters are nearer the *Columbinæ*. Like the *Treroninæ* they have no cæca but like the *Columbinæ* they possess both ambiens muscle and an oil-gland. They are essentially arboreal Pigeons but are not expert climbers like the Green Pigeons and have not got the very broad fleshy feet of those birds, yet they have the soles broader and more fitted for holding than the feet of the *Columbinæ*.

The subfamily is represented throughout India, Burma, East to Polynesia, three genera occurring within our limits.

Key to Genera.

A. Head, neck and lower parts grey.
  a. Mantle plain brown or with purple or coppery tint; inner primaries obliquely truncated ..... DUCULA, p. 202.
  b. Mantle green; inner primaries not truncated ..... MUSCADIVORA, p. 206.
B. Plumage entirely black and white ..... MYRISTICIVORA, p. 211.

Genus DUCULA.

In this genus the obliquely-truncated primaries serve at once to divide it generically from the other two genera. There is no green in the plumage. Sexes alike. There is only one species of the genus found in our limits, divided into several geographical forms.

Ducula badia.

Key to Subspecies.

A. Back and upper wing-coverts deep purple-chestnut ..... *D. b. badia*, p. 202.
B. Back liver-brown with slight purple tint.
  a. Crown and hind-neck both lilac ..... *D. b. insignis*, p. 203.
  b. Crown grey, contrasting with lilac hind-neck ..... *D. b. griseicapilla*, p. 204.
C. Back liver-brown with no purple tint .. *D. b. cuprea*, p. 205.

(1842) Ducula badia badia.

THE MALAYAN IMPERIAL PIGEON.

Columba badia Raffles, Trans. Linn. Soc., xiii, p. 317 (1822) (Sumatra).

Vernacular names. None recorded.

Description. Whole upper part of the head, nape, neck and shoulders a lilac- or vinous-grey, changing gradually into deep purple-chestnut or maroon on the mantle, scapulars, back, lesser and median wing-coverts; lower back, rump and upper tail-coverts dark grey or ashy-grey, the back and rump suffused with the purple of the mantle; tail ashy-black on the concealed base, then black for two-thirds its length, changing to brownish-grey on the terminal third; wing-quills black, changing to the colour of the back on the innermost secondaries; greater coverts brown, sometimes edged or tinged with maroon; throat white; sides of the head and neck ashy; breast and lower parts vinous ashy-grey, flanks and axillaries purer grey and the abdomen often tinged with reddish; under tail-coverts buff; under aspect of tail grey with a broad subapical dark band.

Colours of soft parts. Iris ashy-grey; bill dull purple at the base, light at the tip; feet dull purple (*Beccari*).

Measurements. Wing 209 to 246 mm. (*Robinson*).

Distribution. Sumatra, Malay Peninsula, North to the South of Tenasserim and islands of the Mergui coast.

Nidification. Hopwood took an egg of this race South of Mergui on the 28th April from a frail stick nest about 25 feet up in a small tree in forest. This egg measures 47·0 × 34 mm. I can find no other record of its breeding but it certainly is not rare between 2,000 feet and 4,000 in the mountains of extreme South Tenasserim in the breeding-season.

Habits. A montane bird occurring from the lower hills up to some 5,000 feet and at certain seasons visiting some, or most, of the islands off the coast of South Tenasserim and the Malay Peninsula where they feed on the fruit of the various kinds of mangroves. At this time Robinson says that they are caught in great numbers by the natives with clap-nets, the bait used being fresh water. The same ornithologist notes that during the breeding-season they keep much to the higher ridges of the interior of the Malay Peninsula at about 4,000 feet. In voice, flight, etc., they closely resemble the other races of the species.

(1843) Ducula badia insignis.

HODGSON'S IMPERIAL PIGEON.

Ducula insignis Hodgs., As. Res., xix, p. 162 (1836) (Nepal); Blanf. & Oates, iv, p. 21.

Vernacular names. *Dukul* (Hind. in Nepal); *Fomok* (Lepcha); *Lal Pigoma* (Assam).

Description. Differs from the preceding subspecies in having the mantle, scapulars, etc., a copper-brown tinged with maroon, much less deep and less purple in colour; the sides of the head are more grey and the under tail-coverts are a darker buff; the upper tail-coverts are more grey and less brown.

Colours of soft parts. Iris pale grey, grey or bluish-grey; bill white at the tip and then pale brown, the cere and gape deep fleshy-purple or dull carmine; legs and feet deep purple-lake or dull coral-red tinged with carmine; soles paler and pinker; claws pale brown; orbital skin purple-grey, purer grey next the eye.

Measurements. Total length about 450 to 500 mm.; wing 228 to 259 mm.; tarsus about 25 to 32 mm.; culmen about 25 mm.

Young birds are duller than the adult; the upper parts have no copper-purple tint and have the wing-coverts edged with chestnut.

Distribution. Western Nepal, Sikkim, Bhutan and the whole Tĕrai to Eastern Assam, North of the Brahmapootra. Birds from the Khasia Hills are of this race but those from Cachar, Sylhet, Manipur and the Bengal Districts East of the Bay, though somewhat intermediate, are nearest to *griseicapilla*.

Nidification. This Pigeon breeds throughout its range between the foot-hills and 6,000 feet, most commonly between 2,000 and 4,000 feet, whilst in Lakhimpur we obtained it breeding in the well-forested plains also. Most eggs are laid in May and early June but I have seen well-advanced young in April and fresh eggs in July. One egg only is laid, a typical Pigeon's egg, long oval, almost elliptical in shape. Twenty-two average 46·2 × 33·5 mm.: maxima **49·0 × 36·1** mm.: minima **42·4 × 30·3** mm.

The nest, the normal platform of twigs, is placed on forest-trees at any height between 40 and 15 feet from the ground, the tree selected being generally one in the interior of forest.

Habits. Not distinguishable in any way from those of the next race.

(1844) Ducula badia griseicapilla.

THE GREY-HEADED IMPERIAL PIGEON.

Ducula griseicapilla Walden, Ann. Mag. N. H., xvi, p. 228 (1875) (Karen Hills); Blanf. & Oates, iv. p. 22.

Vernacular names. *Hgnet-nga* (Burmese); *Daohukuruma gagao* (Cachari); *Inruikuru gaherba* (Katcha Naga).

Description. Differs from *D. b. insignis* in having the crown, forehead and nape grey, in some specimens quite sharply defined from the vinous or lilac-grey of the hind-neck; the rump and upper tail-coverts are often more brown and less grey.

Colours of soft parts. Iris greyish-white; corneous tip of bill pale brown, rest of bill and gape and feet rich purplish lake-red; claws brown (*Davison*).

Measurements as in the preceding race. Davison gives the weight of two males as 1 lb. 7 oz. and 1 lb. 4 oz. respectively. Females weigh a trifle less.

Distribution. Assam, in the Surrma Valley, but not in the hill-ranges of the Brahmapootra River or in the Khasia Hills, in which *insignis* occurs; Cachar, Sylhet, Manipur, Bengal East of the

Bay of Bengal and all Burma South to Tenasserim and East to Annam. Birds from Muleyit are of this form and this mountain probably forms its Southern limit. It is also found in the Shan States and Yunnan, whence Rothschild records it under the name of *D. b. badia* from the South-west.

Nidification. Davison obtained a nest and egg of this Pigeon on Muleyit on the 27th January, on a tree close to a path in dense virgin-forest; Hopwood took eggs in March and April in the Chin Hills, Harington during March and April in the Kachin Hills and I several from March to June in North Cachar. In the latter district they breed from about 2,000 feet up to 6,000 and invariably in deep forest. The trees they build in are usually small and the nests low down between 12 and 20 feet from the ground, whilst the nest itself is as carelessly and loosely put together as that of any other Pigeon. One egg only is laid and twelve of these average 45·1 × 34·0 mm.: maxima **49·1 × 33·8** and **45·2 × 36·1** mm.; minima **43·6 × 33·1** and **44·4 × 32·0** mm.

Habits. The Grey-headed Imperial Pigeon is essentially a bird of mountain-forests, though it makes occasional descents into the more open plains at certain seasons of the year when the *Fici* are in full bearing. At these times the flocks which collect are sometimes very large, numbering hundreds, though at other times twenty form a large flock. When feeding on these great trees they clamber slowly about from one branch to another, or flutter the few feet between them. They are not nearly so expert as are Green Pigeons in getting about a tree and cannot hang upside down as these birds often do when feeding. At the same time they are far more peaceable and though their deep calls of "wuck-wurr, wuck-wurr" may be resounding from every part of the tree, there are but few squabbles and no real fighting. It is almost incredible the size of the fruit these birds can swallow but in many cases the figs and other fruits are much bigger than their own heads. The birds are excellent eating but should be skinned before they are cooked and, as their flesh speedily absorbs the flavour of what they feed on, they naturally vary greatly in delicacy and flavouring. Their flight is very swift and direct but they keep so much to dense forest that it is not often one can make a big bag of any species of Imperial Pigeon. They occasionally descend to the ground both to drink and to eat mud and earth at salt-licks and they walk well and fairly easily.

(1845) Ducula badia cuprea.

JERDON'S IMPERIAL PIGEON.

Columba cuprea Jerdon, Mad. Journ. L. S., xii, p. 12 (1810) (Malabar).
Ducula cuprea. Blanf. & Oates, iv, p. 22.

Vernacular names. None recorded.

Description. Differs from *D. b. badia* in having the back and wings olive-brown with little or no gloss and no tinge of purple or copper; the rump is darker and sometimes tinged with olive; the terminal pale band is narrow, not exceeding one-quarter the length of the tail; the under surface is darker and more vinous and is often mixed with ochre on the abdomen and posterior flanks; the under tail-coverts are freckled with dusky and the under aspect of the wing and axillaries are darker than in either *D. b. insignis* or *D. b. griseicapilla*; the white on the chin and throat is also more restricted than in these two races.

Colours of soft parts. "Bill dull lake-red at the base, slaty at the tip; orbits lake-red, irides red-brown; legs dull lake-red" (*Jerdon*).

Measurements. Wing 210 to 234 mm.

Distribution. Southern India, North to Kanara. Through the hills of Koorg, Wynaad and Nilgiris and the Mysore hills Southwards but not from Eastern Madras. It is common in Travancore and Stewart obtained a specimen in Ceylon.

Nidification. This Pigeon breeds commonly in Travancore, Bourdillon and Stewart taking many eggs between the foot-hills and 4,000 feet from March to April, whilst the former again found eggs in November. The nest is the usual rather untidy Wood-Pigeon's platform of sticks, with no lining and little or no depression for the eggs. It breeds both in evergreen and deciduous forest and in both big and small trees but seldom more than 20 or 25 feet from the ground. A series of ten eggs taken by Stewart average 44·5 × 34·7 mm.: maxima **47·1** × 34·0 and 43·0 × **35·4** mm.; minima **43·0** × 35·4 and 47·1 × **34·0** mm.

Habits. Like other Pigeons of this genus this is a bird of hills and forests, making occasional excursions into the plains, after certain kinds of fruits, and to salt swamps, where they eat the buds of *Avicennia* and other bushes. In other respects they do not differ in their habits from the other races.

Genus **MUSCADIVORA**.

Muscadivora Selby, Nat. Libr., Pigeons, p. 112 (1835).

Type, *Columba ænea* Linn.

This genus differs principally from *Ducula* in not having any of the primaries truncated and in having the upper plumage strongly glossed with green. The bill is much like that of *Ducula*, slender and long with a long cere or soft basal portion and a short horny tip or rhamphotheca. Sexes alike.

Only one species occurs within our limits, which is divided into four geographical races.

Muscadivora ænea *.

Key to Subspecies.

A. Larger, wing generally over 215 mm.
  a. Under tail-coverts deep dull maroon.
    a'. Cheeks, ear-coverts and throat strongly tinged with pink ..... *M. æ. ænea*, p. 207.
    b'. Cheeks, ear-coverts and throat pure grey or faintly tinged with pink ..... *M. æ. sylvatica*, p. 208.
  b. Under tail-coverts dull rufous-brown..... *M. æ. insularis*, p. 210.
B. Smaller, wing generally under 215 mm. .. *M. æ. pusilla*, p. 209.

(1846) Muscadivora ænea ænea.

THE MALAY GREEN IMPERIAL PIGEON.

Columba ænea Linn., Syst. Nat., 12th ed., i, p. 283 (1766) (Flores).
Carpophaga ænea. Blanf. & Oates, iv, p. 19 (part.).

Vernacular names. *Hunget-ma-nwa*, *Hnget-knit-nwa*, *Bon-madi* (Burmese).



Fig. 28.—Sole of foot of *Muscadivora æ. ænea*. ½.

Description. Head, neck and the whole of the lower plumage except the under tail-coverts a beautiful dove-grey, suffused everywhere with vinous-pink; forehead and extreme chin white; back, rump, upper tail-coverts and exposed portions of the wing, excepting the primaries, dark, bright metallic green; in most birds over this green is a strong wash of metallic bronze with reflections of deep blue or copper, whilst in some specimens, especially from North-East India, these parts are practically fiery copper-bronze; tail like the back but less metallic and more blue; under tail-coverts a rather dark rich liver-colour or dull maroon; primaries dark blue-grey, almost black, changing to pale brown on the inner webs; the inner primaries becoming more green and the secondaries like the back; under surface of tail pale dull brown; under aspect of wings dove-grey.

Colours of soft parts. Iris deep red, maroon-red or crimson; bill white at the tip, bluish or grey-white in the centre and purplish-red on the basal half and cere; legs and feet dull purple-

* Hartert, Nov. Zool., xxvi, p. 346 (1918), shows that though the Andaman bird is not separable from the Indian one (*sylvatica*), the typical form *ænea* is separable. With this I agreed in my Catalogue (1922).

red to lake-red or, rarely, deep coral-red; claws horny-brown tinged lake.

Measurements. Total length about 420 to 450 mm.; wing 218 to 240 mm.; tail 142 to 153 mm.; tarsus about 26 to 27 mm.; culmen about 25 mm.

Distribution. Sunda Islands, Lombok, Flores, Sumba, Pantar and Alar Islands and North through the Malay Peninsula to South Tenasserim. Tenasserim specimens, as in so many species of birds, are somewhat intermediate but the Southernmost seem distinctly referable to this race.

Nidification. Bingham found this fine Pigeon breeding on the Wimyo River in Tenasserim during February, whilst Cook and Hopwood both took eggs South of Tavoy from March to May. Nests and eggs are like those of the next race. Six eggs average 47·7 × 33·4 mm. The eggs of the *Duculinæ* differ from those of the *Columbinæ* in being less glossy and hard-shelled.

Habits. Those of the genus. This is a very common bird both in the South of Tenasserim and in the Malay Peninsula.

(1847) Muscadivora ænea sylvatica.

THE INDIAN GREEN IMPERIAL PIGEON.

Columba sylvatica Tickell, J. A. S. B., ii, p. 581 (1833) (Borabhum).
Carpophaga ænea. Blanf. & Oates, iv, p. 19 (part.).

Vernacular names. *Dunhal* or *Dumkal*, *Pona Kabutra*, *Barra Harial* (Hind.); *Hunget-ma-nwa*, *Hnget-knit-nwa* (Burmese); *Paguma* or *Porguma* (Assam); *Daohukuruma* (Cachari); *Inruikura* (Katcha Naga).

Description. Differs from the preceding bird in having the grey of the head and especially of the hinder neck a much purer grey; the vinous tint on the lower plumage is also less, or even absent; the green of the upper plumage is also more pure and brilliant with less copper tinge.

Colours of soft parts as in the other races.

Measurements. Wing 212 to 254 mm., in Northern bird seldom under 224 mm.; Bengal and Orissa birds seldom under 220 mm.

Distribution. Nepal and Sikkim Terai; Bengal and Behar, South to Orissa and ? North Madras in the Circars; Assam, Burma to Central Tenasserim, Shan States and Northern Siam. Andaman birds are very green and average more white on the forehead and face but seem hardly separable from *sylvatica*.

Nidification. The Indian Green Imperial Pigeon breeds in Assam from March to June between the foot-hills and the ridges up to 4,000 feet or, rarely, 2,000 feet higher. Wimberly took eggs in the Andamans up to July and Osmaston many in April. In Burma they breed from February to May. In the plains of Assam and Bengal they are said to lay in June and July after the

rains break. The nest is the usual rough platform of sticks and twigs interlaced so as to leave a shallow depression in the centre for the egg. Inglis and Bingham both mention a certain amount of grass in the construction of the nest, but this must be quite unusual. The great majority of nests are built upon small saplings at a height of about 25 feet from the ground but, occasionally, they are built in large trees at a height from the ground of 40 feet or over. The tree selected is always in forest and in most cases close to a stream, whilst bamboo-clumps similarly situated are occasionally used. One egg only is laid and twenty-two of these average 45·4 × 33·5 mm.: maxima 51·5 × 33·5 and 45·6 × 37·6 mm.; minima 41·1 × 32·2 and 42·6 × 31·2 mm.

Habits. This Pigeon is found both in the plains and in the hills up to about 6,000 feet or rather higher, being most common in the foot-hills and adjacent plains and up to 3,000 feet. They occasionally collect in small flocks of half a dozen to a score but more often they are seen singly or in pairs. Where, however, there are fruit-trees in bearing, more especially some of the wild figs, the birds collect in immense numbers. They drink regularly morning and evening and for this purpose alight on the ground, moving quite freely thereon and every now and then walking to the water's brink, where they thrust their bills deep in, taking long draughts. I have never seen them bathe in a state of nature, though tame birds do so frequently. They are almost entirely frugivorous but eat a certain number of buds and shoots as well. Their flight is fast and powerful, though the small amount of flapping indulged in gives one the idea that it is leisurely. When flighting from one feeding-ground to another or to and from their roosting-places they fly high and therefore seldom form part of a general Pigeon bag, though easy enough to shoot at their feeding-trees. Their call is a very deep, rolling "wuck-wuck-wurr." They are not quarrelsome birds and are easy to keep in captivity but they are lethargic and uninteresting pets unless kept unconfined, their most noticeable feature being greed. They are excellent birds for the table.

(1848) **Muscadivora ænea pusilla.**

THE CEYLON IMPERIAL GREEN PIGEON.

Carpophaga pusilla Blyth, J. A. S. B., xviii, p. 816 (1840) (Ceylon).
Carpophaga ænea. Blanf. & Oates, iv, p. 19 (part.).

Vernacular names. *Pogonna* (Mal.); *Kukurani guwa* (Tel.); *Maratham praa* (Tam., Ceylon); *Maha nila goya, Mata lata goya* (Cing.).

Description. Similar to the Indian bird but decidedly smaller.

Colours of soft parts as in the other races.

Measurements. Wing 200 to 220 mm. Ceylon birds do not exceed 216 mm. and most are under 210 mm. Southern Indian

birds run up to 220 mm. and overlap with Northern India but there is a vast area between the two races where no Green Imperial Pigeons occur and, as it is neither scientific nor necessary to create yet another race, it is better to retain these birds with *pusilla*.

Distribution. Ceylon, South-west coast of India from Cape Comorin to Kanara. Jerdon recorded it from the Central Province probably incorrectly and in East and Central Madras its habitat has not yet been properly worked out.

Nidification. Similar to that of the Indian race. In Ceylon it breeds in February and March; in Travancore, February to April, whilst Stewart also found eggs in June; in Karwar, Davidson and Bell obtained eggs from February to April. Five eggs average 43·4 × 33·0 mm., showing that the eggs like the birds average much smaller than in the other races.

Habits. Those of the species. Like the other races this is a bird of humid dense forests and where the country East and North gets drier and more open they are not found, nor do they appear again until the wet regions of the North and North-east are reached.

(1849) Muscadivora ænea insularis.

THE NICOBAR IMPERIAL GREEN PIGEON.

Carpophaga insularis Blyth, J. A. S. B., xxvii, p. 270 (1858) (Nicobars); Blanf. & Oates, iv, p. 20.

Vernacular names. None recorded.

Description. Differs from *M. æ. ænea* in having the under tail-coverts a dull reddish-brown; the grey of the head and underparts is still purer without any pink or vinous tinge; the green of the upper parts is darker and more blue; the tail is more blue and darker both above and below.

Colours of soft parts. "Legs and feet dull deep pink, pinkish-red or livid purple; the bill is pale plumbeous, paler on tip and darker on cere and base; irides vary a good deal, sometimes they are pale ruby-red; the eyelids are pale lavender" (*Hume*).

Measurements. Wing 222 to 260 mm.; tail 152 to 177 mm.; tarsus 25 to 30 mm.; culmen about 25 to 31 mm.

Weight 1 lb. to 1 lb. 12 oz. (*Hume*), 1½ lb. (*Richmond*).

Distribution. Nicobars.

Nidification. Davison found it breeding in Trinkut in February and March, obtaining one egg from a nest built in a coco-nut palm, about twenty feet from the ground. The egg measured 48·2 × 34·8 mm.

De Roepstorff obtained a fully-fledged young bird on the 20th February.

Habits. Similar to those of *M. æneâ æneæ* except that it is very tame. It is said to be very common on all of the islands of the Nicobars, sometimes associating in small flocks, at other times being found singly or in pairs.

Genus MYRISTICIVORA.

Myristicivora Reichenb., Av. Syst. Nat., p. 26 (1852).

Type, *Columba bicolor* Scop.

The genus *Myristicivora* contains certain Pigeons distinguished by their peculiar creamy-white and black coloration, whilst they also differ from those of the genus *Muscadivora* in having much shorter tails. There is no naked skin round the eye and the lores are fully feathered. In various forms this genus, of one species, ranges thoughout the Indo-Malayan region to New Guinea and Australia.

(1850) Myristicivora bicolor bicolor.

THE PIED IMPERIAL PIGEON.

Columba bicolor Scop., Del Flor. et Faun., Insubr., ii, p. 94 (1896) (New Guinea).
Myristicivora bicolor. Blanf. & Oates, iv, p. 23.

Vernacular names. *Kaluia* (Car Nicobar).

Description. Bastard-wing, primaries and outer secondaries deep slaty, almost black; central tail-feathers with a terminal band of black nearly two inches deep, this band gradually decreasing in width on each succeeding pair to about 8 or 10 mm. on the outermost pair, which pair is also sometimes margined with black on the central portion; the under tail-coverts sometimes have edges of black, more rarely a broad band of black at their tips; remainder of plumage creamy-white, the creamy tinge varying greatly individually and fading rapidly in skins.

Colours of soft parts. Iris dark brown; bill leaden-blue, the bill dark horny or dark plumbeous; legs and feet pale smalt-blue.

Measurements. Wing about 218 to 231 mm.; tail about 125 to 135 mm.; tarsus about 26 to 29 mm.; culmen 23 to 26 mm.

The extent of cream on the plumage varies greatly and is generally most developed on the head and shoulders. Robinson and Kloss consider the colour, at all events to some extent, natural but other observers believe it to be merely stains from nutmegs and other fruit. Its patchy appearance and its prevalence about the face and head support this latter idea but Robinson tells me he has obtained birds the whole plumage of which was a level creamy-buff, though it soon faded.

Distribution. Andamans and Nicobars through the Malay Peninsula to New Guinea. It has occurred on the coasts and islands of Burma from Sondoway in Arrakan, where it

was obtained by Hopwood in 1910. It visits constantly the islands of the Mergui coast and also in scanty numbers the coast itself and is said to breed regularly in all the islands. It also occurs, though irregularly, on the West Malay coast and more numerously in the islands.

Nidification. Osmaston took a long series of these birds' eggs on Sentinel Island in the middle of February and thus describes their nesting:—"We found the island swarming with the Pied Imperial Pigeon, and it was not long before we found a nest containing a single fresh egg, followed by many others. Altogether we found some fifty nests containing each a single egg, some fresh, some more or less incubated.

"The nests were not as a rule close together. They were placed near the tops of small trees, or on the lower branches of big ones, usually about 25 feet from the ground. One nest I found was only 10 feet from the ground, but this was exceptional.

"The nest is the usual flimsy platform of sticks, through which the egg is visible from below."

Habits. This Pigeon is extremely common on many islands of the Andamans and Nicobars and probably almost equally so at certain times of the year on the islands of the Mergui and Malay coasts but it is not yet certain if they are residents or merely visitors to most of the islands. In spite of its handsome plumage Butler says that it is by no means conspicuous when on trees, the black and white looking like patches of sunlight and deep shadow. It is as fearless and tame as it is common but so many of its haunts are almost inaccessible that its undue diminution need not be feared. Its flight is powerful, direct and swift and its note is said to be a deep "hu-hu-hu." It is entirely frugivorous and during the season they feed almost exclusively on nutmegs, swallowing these whole and then rejecting the nuts and retaining the mace.

Subfamily CALŒNADINÆ.

Like the last this Subfamily consists of one very striking genus, and that genus, *Calœnas*, of a single species.

In this Subfamily the tail has only twelve tail-feathers; the ambiens muscle and oil-gland are present but there is no intestinal cæca; the legs are long and both they and the feet are strong and well adapted for walking, the soles not being expanded as in the arboreal Pigeons; the bill is long, the apical portion well covered and there is a fleshy protuberance at the base, more developed in the male than in the female; the neck is furnished with long metallic hackles, a feature which at once differentiates it from all our other Indian Pigeons.

Genus CALŒNAS.

Calœnas Gray, List Gen. Birds, p. 59 (1840).

Type, *Columba nicobarica* Linn.

Characters of the genus are the same as those of the Sub-family.

(1851) Calœnas n. nicobarica.

THE NICOBAR PIGEON.

Columba nicobarica Linn., Syst. Nat., 10th ed., i, p. 164 (1758) (Nicobars).
Calœnas nicobarica. Blanf. & Oates, iv, p. 24.

Vernacular names. *Lo-ung* (Nicobarese).

Description.—Male. Head, neck and upper breast deep slaty-black, in perfect specimens having a beautiful purple-blue sheen; shorter neck-hackles the same but glossed with metallic green near the tips; longer hackles metallic blue or copper-bronze, but nearly all with margins of deep metallic blue-black and with dark green shaft-stripes. Upper plumage from shoulders to



Fig. 29.—Head of *C. n. nicobarica*. ½.

upper tail-coverts, lesser and median wing-coverts and innermost secondaries bright metallic green, varying greatly individually. In some the prevailing colour is copper-bronze, in a few almost flaming copper, whilst in a few others this tint is almost absent; shoulder of wing, greater coverts and inner secondaries deep Prussian blue with more or less of a metallic sheen and a varying amount of green gloss; primaries blue-black externally and brown-black on their concealed portions; tail with a few of the longest upper coverts and all the under tail-coverts white;

lower plumage from breast to vent, flanks and under aspect of wings metallic green, more or less marked with Prussian blue.

Colours of soft parts. Iris white (*Ingram*), buff (*Layard*) or nut-brown (*Davison*); legs and feet purplish-violet to almost coral-red; bill greyish or slaty-black.

Measurements. Total length about 380 to 420 mm.; wing 247 to 268 mm.; tarsus about 36 to 42 mm.; culmen about 24 to 27 mm.

Female differs in having the head, neck and breast more grey and generally in having less of the deep blue sheen; the hackles are usually less developed.

Young males are like the adult but with no long neck-hackles.

Distribution. The Cocos, Andamans and Nicobars through the islands of the Malay Archipelago to the Solomon Islands. It has not yet been found on any of the islands of the Timor group.

Nidification. The Nicobar Pigeon breeds during March in thousands in Battye Malve and in lesser numbers in some of the other islands. They nest in colonies, several pairs of birds building their nests in the same trees and almost every suitable tree being occupied. The nests are the usual badly put together fragile platforms of sticks placed between 10 and 30 feet from the ground. Only one egg is laid and this can be distinguished from that of the preceding bird by its larger size and by the inner membrane of the shell, which is orange-yellow in the eggs of this species and pale lemon-yellow in that of *Myristicivora*. Osmaston took a large series of these eggs on the 23rd March at Battye Malve, eighteen of which average 48·6 × 33·9 mm.: maxima **55·1** × 33·0 and 50·1 × **35·2** mm.; minima **46·3** × **32·9** mm.

The next longest egg I have seen was only 51·4 × 33·4 mm.

Habits. This curious Pigeon, except when breeding, seems to keep entirely to the ground, sometimes in small parties, at other times singly or in pairs; they walk about sedately, seldom running, their wings drooped, searching about among the fallen leaves with their bills and never scratching with their legs like fowls etc. They feed principally on fallen seeds and fruit and usually tiny quartz pebbles are found in their gizzards, which are said to be exceptionally hard and long. Their flight is powerful and rapid, though heavy-looking, and they are shy alert birds, avoiding observation. The note is described as a deep croak very seldom uttered.

Subfamily PHABINÆ.

This Subfamily consists of a large group of twelve genera and numerous species spread over Africa and Asia; in India through the Malay Archipelago and Indo-Chinese countries to



adult. CHALCOPHAPS INDICA (LINN.)

Australia; one genus with one species is found within our limits. The Pigeons of this Subfamily are terrestrial in their habits and in some respects closely allied to *Calœnas* both in anatomy and in having twelve tail-feathers but they differ greatly in having no neck-hackles. The upper plumage is metallic, the wing moderate with the second and third primary subequal in length; the feet and tarsi are bare, the former slender and well adapted to running about on the ground.

Genus CHALCOPHAPS.

Characters the same as for the Subfamily.



Fig. 30.—Head of *C. indica*. ½.

Key to Subspecies.

A. Median grey line down nape and scapulars ill-defined; size bigger ..... *C. i. indica*, p. 215.
B. Median grey line very definite and well-defined; size smaller ..... *C. i. robinsoni*, p. 217.

(1852) Chalcophaps indica indica.

THE INDIAN EMERALD DOVE.

Columba indica Linn., Syst. Nat., 10th ed., i, p. 164 (1758) (East Indies, restricted to Calcutta).
Chalcophaps indica. Blanf. & Oates, iv, p. 26 (part.).

Vernacular names. *Ram-ghugu*, *Raj-ghugu* (Beng.); *Andi-bella-guwa* (Tel.); *Pathaki-prua* (Tam.); *Ka-er* (Lepcha); *Muti-repuka* (Assam); *Sil-kepa* (Naogang, Assam); *Gyo-sane*, *Gyo-sein* (Burmese), *Daotualai* (Cachari).

Description.—Male. Forehead and broad supercilia white, changing to dark blue-grey on the crown and nape; sides of the head, neck, shoulders and upper breast a deep vinous-red, paling on the abdomen and lower breast; back, scapulars, wing-coverts and inner secondaries metallic emerald-green with

a varying amount of bronze reflections, in a few individuals this bronze tint practically replacing the green; edge of wing, bastard-wing, primaries, outer secondaries, and greater coverts dark brown; inner secondaries like the back; least wing-coverts and shoulder of wing vinous-red like the neck, sometimes more grey, bordered by a fringe of white feathers; lower back deep copper-bronze with a band of feathers across fringed white or greyish-white; rump grey next the lower back, deepening to brown towards the upper tail-coverts which are grey edged with dark brown; tail brown, the outer two or three pairs grey with a broad black band; under tail-coverts dark slaty-grey; under aspect of wing bright brick or copper-red.

Occasionally a very old male has a few spots of metallic green or bronze on the lower breast and abdomen.

Colours of soft parts. Iris hazel or dark brown; the eyelids leaden-grey; bill red, the cere darker and rather sanguine, the tip paler and more coral-red; legs and feet coral-red, the soles paler and the claws pale horny-brown.

Measurements. Total length about 250 to 270 mm.; wing 148 to 161 mm.; tarsus about 25 mm.; culmen about 15 to 16 mm. Females are rather smaller—wing average 142 as against 146 mm. in males.

Females. Very old birds are said to be indistinguishable from the male but whenever I have shot pairs of this Dove the differences have been noticeable. Generally there is less white on the forehead and supercilia and the grey crown and nape is sometimes suffused with reddish; the white wing-patch and white bars across the rump are not so pronounced; the central tail-feathers are a redder brown and only the outermost pair of feathers are grey.

Young males are like the females but still duller in colour and the bronze-green is less in extent and freely barred with copper-red; there is a broad rufous bar across the wing, the inner secondaries are tipped with rufous-red and the whole under plumage barred dull brown and rufous.

Distribution. Travancore to Bombay on the West coast; Kashmir and Kuman to Eastern Assam in the Himalayas; Bengal, Behar, Orissa and the East coast at least as far as Masulipatam; Northern Burma as far as the Shan States, Tenasserim, the Andamans and Nicobars, but not the dry central zone of Burma; the Malay States and Malay Archipelago to the Philippines.

Nidification. The Emerald Dove breeds wherever found from the plains up to some 2,000 feet, but not often above 3,000 feet. The nest is a typical Dove's nest made of small twigs and sticks but is rather well put together and has a definite depression for the eggs. Most nests are built on high bushes, saplings or clumps of bamboos between 5 and 10 feet from the ground,

whilst in Tenasserim Davison found nests in young coco-nut palms about 6 feet from the ground. The eggs, two in number, are not white but a pale creamy-yellow, buff or café-au-lait. The surface is smooth and sometimes glossy, the shape is almost elliptical and the texture fine and close. One hundred eggs average 27·0 × 21·0 mm.: maxima 28·8 × 22·3 mm.; minima 23·5 × 19·6 mm.

The breeding-season is during January and February in the Andamans, Nicobars and Tenasserim but in Burma and North-East India most eggs are laid from March to May whilst eggs may be taken up to September and many birds have two or even three broods.

Habits. This little Dove is a forest-bird, frequenting humid evergreen forests in preference, though being found also in deciduous forest and scrub-jungle. It seems to love to feed in the middle of forest-tracks and, when disturbed, flashes away for two or three hundred yards at great speed and then alights. This process may be repeated several times until the birds, they are nearly always in pairs, double back through the forest and return to the path behind one. It is a great haunter of salt licks, and in Cachar some of these are known as "Doves' homes." On the ground they run well and when catching termites are very speedy. Except for termites they are purely vegetarian and though they eat several kinds of grain are principally fruit-eaters. Their note is a soft, very deep low "coo."

(1853) Chalcophaps indica robinsoni.

THE CEYLON EMERALD DOVE.

Chalcophaps indica robinsoni Stuart Baker, Bull. B. O. C., xlviii, p. 58 (1928).
Chalcophaps indica. Blanf. & Oates, iv, p. 26 (part.).

Vernacular names. *Nila robeya* (Cing.).

Description. Similar to the preceding form but with the grey of the head and nape running down the hind neck to the scapulars in a well-defined line. It is also a smaller bird.

Colours of soft parts as in the typical race.

Measurements. Wing, ♂ 132 to 143 mm., ♀ 127 to 134 mm.

Distribution. Ceylon.

Nidification. This Emerald Dove breeds in the forests of Ceylon from January to June, its nidification being just like that of the preceding bird. The eggs are small and two pairs taken by Phillips are almost white; these may, however, be unusual, as Wait records the eggs as pale buff. The few I have measured average 26·1 × 19·9 mm.

Habits. Similar to those of the Indian bird.

Subfamily COLUMBINÆ.

In this Subfamily all the genera have twelve tail-feathers, the tails themselves varying greatly in length and shape in the various genera and species; the ambiens muscle, intestinal cæca and oil-gland are all present. The feet vary somewhat and some have broader soles than others according to whether their habits are terrestrial or arboreal; all, however, are well adapted for walking and even the most arboreal species walk well and freely on the ground.

The division of the *Columbinæ* into genera is one of considerable difficulty and especially is it difficult to decide what species should be included in *Columba*. The type of *Columba* has hitherto been held to be *œnas* but Mathews has recently discovered that Selby in 1852 designated *palumbus* as the type in his Ill. Brit. Birds. Those therefore who split the Wood-Pigeons and Rock-Pigeons into two genera must use *Lithœnas* (Reichenbach, Av. Syst. Nat., p. 25, 1862) for the latter. I can, however, find no constant character either structural or in colour or colour-pattern which is satisfactory. The two prominent characteristics are the presence or absence of the neck-spot or ring and the comparative length of the tail but as these two contradict one another it seems better to discard them and to follow Hartert in keeping all these birds in the one genus. The Purple Wood-Pigeon and the Andaman Wood-Pigeon seem to be sufficiently well differentiated by their curious coloration and much larger naked area round the eyes; these I retain in the genera *Alsocomus* and *Ianthœnas*, removing Blanford's other species of this genus back to *Columba*.

It seems probable that a review of the Pigeons of the World would demonstrate that colour and colour-pattern are characters of greater importance in Pigeons than are slight structural differences, which, as we have shown in the *Treroninæ*, seem to mean nothing.

Key to Genera.

A. Tail not longer than wing and not greatly graduated.
  a. Neck-feathers not acuminate.
    a'. Larger, wing over 180 mm.
      a''. Plumage of various greys, black and white ..... COLUMBA, p. 219.
      b''. Plumage deep chestnut, crown white ..... ALSOCOMUS, p. 231.
      c''. Plumage purple-black, whole head grey ..... IANTHÆNAS, p. 233.
    b'. Smaller, wing under 180 mm.
      d''. Sexes alike; 2nd and 3rd quill longest ..... STREPTOPELIA, p. 236.
      e''. Sexes differing; 1st and 2nd quill longest ..... ŒNOPOPELIA, p. 249.
  b. Neck-feathers acuminate and lengthened ..... DENDROTRERON, p. 234.
B. Tail-feathers longer than wing and much graduated ..... MACROPYGIA, p. 253.

Genus **COLUMBA.**

Columba Linn., Syst. Nat., 10th ed., i, p. 1758.

Type, *Columba palumbus* Linn. Desig. by Selby, Ill. Brit. Birds, March 1925.

In this genus the tails are short or moderate, the tips of the wings reaching to, or almost to, the end of the tail; the tarsi are bare and the feet well fitted for walking; the nostrils are narrow and obliquely set in the swollen cere; the wings are long and pointed, the first or second primaries being longest, or rather rounded, the first quill being about equal to the fourth.

Key to Species.

A. Tail less than two-thirds of wing in length.
  a. No collar-patch on side of neck.
    a'. No white band across tail ..... *C. livia*, p. 219.
    b'. A white band across tail.
      a''. Head and fore-neck grey ..... *C. rupestris*, p. 222.
      b''. Head slaty-black, fore-neck white. *C. leuconota*, p. 224.
  b. A collar-patch on either side of neck.. *C. œnas*, p. 225.
B. Tail more than two-thirds length of wing.
  c. A conspicuous white bar across and under tail..... *C. palumbus*, p. 227.
  d. No white bar across tail below.
    e'. A *patch* of black, white-tipped feathers on either side of the base of the neck.
      c''. Head above and lower parts grey. *C. elphinstonii*, p. 228.
      d''. Head above and lower parts lilac. *C. torringtonii*, p. 229.
    d'. A *collar* of black feathers, tipped with glossy buff ..... *C. pulchricollis*, p. 230.

Columba livia.

Key to Subspecies.

A. Lower back paler and contrasting with dark upper back.
  a. Lower back and rump white ..... *C. l. livia*, p. 219.
  b. Lower back and rump pale grey ..... *C. l. neglecta*, p. 220.
B. Lower back, rump and upper back concolorous ..... *C. l. intermedia*, p. 221.

(1854) Columba livia livia.

THE BLUE ROCK-PIGEON.

Columba domestica β *livia* Gmelin, Syst. Nat., i, p. 769 (1789) (South of France).
Columba intermedia. Blanf. & Oates, iii, p. 29.

Vernacular names. Same as for the Indian Blue Rock-Pigeon.

Description. Head dark purple-grey; nape, neck all round, upper breast and extreme upper part of interscapulary region dark grey, glossed with brilliant metallic purple and green; upper back ashy-grey, grading into white on the lower back, the white forming a broad band, 50 to 60 mm. broad; rump and upper tail-coverts dark grey, generally a little darker than the upper back; tail dark grey with a broad subapical band of black; edge of outermost rectrices from the base to the black band white; wing-coverts grey with two broad bars of black, the first formed by the black bases of the greater coverts and the second by the innermost secondaries, which are black with grey bases and tips; primaries brownish-grey, paler on the inner webs except at the tips; lower parts slaty-grey, darkest on the breast; under wing-coverts and axillaries white, the former tinged with very pale grey.

Colours of soft parts. "Iris orange-red; bill vinous slate-colour, inclining to white on the cere; legs red" (*Salvadori*).

Measurements. Wing 208 to 230 mm.; tail 110 to 127 mm.; tarsus 27 to 32 mm.; culmen 19 to 21 mm.

Distribution. Europe to Asia Minor, Caucasus and North Persia; a rare straggler into North-West India.

Nidification. Breeds in cliffs, rarely in old buildings etc., laying two white eggs similar to those of the next bird. Jourdain gives the average of seventy-seven eggs as 39·3×29·2 mm.: maxima **43·0**×29·8 and 41·3×**31·5** mm.; minima **36·4**×29·0 and 38·0×**27·0** mm.

Habits. Those of the genus.

(1855) Columba livia neglecta.

HUME'S BLUE ROCK-PIGEON.

Columba neglecta Hume, Lahore to Yarkand, p. 272 (1873) (Ladak).
Columba livia. Blanf. & Oates, iv, p. 29 (part.).

Vernacular names. *Kabutar* (Hind.); *Kentisiam* (Pushtu); *Kapoth* (Baluchi); *Kaftar* (Persian).

Description. Similar to the European Rock-Pigeon but the general plumage paler, whilst the lower back varies individually from white to pale grey or pale bluish-grey; the band thus formed is narrower than in the typical form.

Colours of soft parts as in the typical form.

Measurements. Wing 226 to 240 mm.

Distribution. Turkestan, East and South Persia, Afghanistan, Baluchistan, Sind, Kashmir and North-West Frontier Provinces and North-West Punjab.

Nidification. Hume's Rock-Pigeon breeds practically all the year round in Sind and other places at low elevations but above 5,000 feet their season is restricted to April, May and June for

first layings, second broods being raised as late as September. Normally their nesting differs in no way from that of the next bird, *intermedia*, but in the Deragut District Pitman found two nests made on trees—"massive constructions of sticks and twigs lined with finer material and dead grass. One was placed among the thin top branches about 18 feet from the ground; the other was placed on a stout branch 12 feet from the ground." Another curious site is recorded by Marshall, who found them breeding in the underground water-channels round about Quetta. Forty-eight eggs average 38·5 × 28·7 mm.: maxima **42·5** × 28·0 and 40·0 × **29·6** mm.; minima **36·0** × 27·8 and 36·1 × **27·5** mm. Fulton and Whitehead both found it breeding at 10,000 feet on the North-West Frontier.

Habits. Those of the species. This Pigeon, however, sometimes seems to undertake curious local movements. Thus Rattray records them as breeding in hundreds at Thull up to April and then suddenly disappearing. In Chitral, again, Whitehead found them common from August to April but absent from May to July; probably food-conditions govern their comings and goings.

(1856) **Columba livia intermedia.**

THE INDIAN BLUE ROCK-PIGEON.

Columba intermedia Strick., Ann. Mag. Nat. Hist., 1844, p. 39 (India) (Calcutta); Blanf. & Oates, iv, p. 29 (part.).

Vernacular names. *Kabutar* (Hind.); *Paraira* (Mahr.); *Gudi Purai* (Tel.); *Mada praa* (Tam., Ceylon); *Kabtretar* (Behar); *Noni Daotu* (Cachari); *Kho* or *Taw-kho* (Burmese).

Description. Similar to the European Rock-Dove but the whole plumage a darker grey, whilst the lower back is concolorous with the upper back or only slightly paler; the rump is distinctly darker; the quills are darker with less and darker grey on the inner webs.

Colours of soft parts. Iris orange-yellow to orange-red; bill black, the cere livid grey or whitish and the base of the mandible paler; legs crimson-red, sometimes very dark, sometimes lighter coral-red, soles paler and claws horny.

Measurements. Wing, ♂ 210 to 238 mm., ♀ 202 to 223 mm.

Distribution. Ceylon and practically the whole of India with the exception of the area occupied by the preceding race. I have never seen it in Assam East of Goalpara, whilst South of the Brahmapootra it is rare but it is again common in the Bengal districts East of the Bay. In Burma it is common in the dry central zone and Macdonald records it as common in the Myingyan District but it seems to be rare, or absent, in the wetter areas of North and South Burma. There is a skin in the British Museum from Siam which, however, may be that of a domesticated bird.

Nidification. This Pigeon breeds practically the whole year round but most eggs are laid from February to April and fewest during the wettest months, July to September. In some parts of India, such as the old fort at Bhurtpore, where they are held sacred, they breed in colonies of countless thousands, whilst on the cliffs about the Gaisoppa Falls they are almost equally numerous. The nests, which are verminous piles of all sorts of rubbish, straw, feathers, etc., are often packed close together and I once counted over 200 nests in the roof of a police-station in Nadja, the nests touching one another in large clumps and apparently used again and again. The two eggs laid are of the usual rather long elliptical shape and one hundred eggs average 36·9×27·8 mm.: maxima 41·4×27·6 and 37·3×32·7 mm.; minima 35·0×26·0 mm.

Habits. The Indian Blue Rock-Pigeon is found throughout the plains except in some of the wettest areas and ascends the hills of Southern India up to 4,000 feet or higher. In the Himalayas, however, it does not seem to occur much over 2,000 feet, except casually. It roosts at night at its breeding-places, whether these be cliffs or buildings of various sorts, and good sport can often be obtained as they flight backwards and forwards in evenings and mornings. They are excellent birds for the table, though big squabs from the nest are better than old birds. They are principally grain-feeders and, where not held sacred or semi-sacred, one often gets appeals to shoot them on account of the damage they do to crops. They also eat fruit and various kinds of shoots and buds. Their flight is swift and direct and, generally, not very high from the ground, whilst they walk and run easily and quickly. Their note is the deep "coo coo" of the domestic Pigeon.

Columba rupestris.

Columbus œnas δ rupestris Pallas, Zoogr. Russo-Asiat., i, p. 560 (1827).

Type-locality: Dauria.

The typical form differs from that found in the Himalayas in being darker, especially on the abdomen and lower tail-coverts.

(1857) Columba rupestris turkestanica.

THE TURKESTAN HILL-PIGEON.

Columba rupestris turkestanica Buturlin, Orn. Monatsbr., p. 45 (1908) (Altai).
Columba rupestris. Blanf. & Oates, iv, p. 30.

Vernacular names. *Ydivá Kabtar* (Turki); *Angoa, Oron* (Tibetan).

Description. Whole head, chin, throat and nape dark dove-grey; hind-neck and shoulders darker grey, glossed with green and to a less extent with purple; upper back, scapulars, wing-coverts and innermost secondaries pale dove-grey, much lighter than that of the head; bases of median coverts and innermost secondaries blackish, showing as indefinite bars; quills grey, tinged with brown on the outer webs and on the tips and edge of the inner webs; lower back white, rump and upper tail-coverts dark grey; tail dark slaty-grey, broad band of white across the middle and the tip blackish; outermost pair of feathers white at the base and on the edge of the outer web; breast vinous-grey, glossed with purple next the neck; paling to almost white on the centre of the abdomen and lower tail-coverts; edge of wing below grey, remaining under wing-coverts and axillaries white.

Colours of soft parts. Iris deep orange-yellow to golden-red; bill black or slaty-black, tinged plumbeous or flesh-colour on the cere and gape; legs and feet coral- or lobster-red, soles paler, claws pale horny.

Measurements. Total length about 330 to 350 mm.; wing 216 to 243 mm.; tail about 118 to 130 mm.; culmen 15 to 17 mm.; tarsus about 25 to 28 mm.

Distribution. Altai, Turkestan and the Himalayas from Gilgit to Tibet and Sikkim and there are specimens in the British Museum labelled Darjiling, but which probably came from further North.

Nidification. Marshall found these Pigeons breeding in the Pangi Valley, on the Chenab: Ward records it as very common in parts of Kashmir in the higher elevations. In Tibet it is extraordinarily common, breeding in the Gyantze Plateau between 11,000 and 14,000 feet and in lesser numbers considerably higher. The nests are placed most often in Tibetan houses, both inhabited and empty, any hole in the walls or under the rafters sufficing for the purpose. At other times they breed in colonies in cliffs in places which are quite inaccessible. Two eggs of the usual type are laid during April, May, June and July and probably some birds have two broods in the year. Fifty eggs average 37·0×27·5 mm.: maxima **39·0**×26·5 and 38·5×**29·3** mm.; minima **35·9**×28·0 and 36·8×**26·2** mm.

Habits. Apparently very similar to those of the common Rock-Pigeons. In Tibet they are found about the villages in great numbers, so tame that they will hardly move out of one's way. Their diet, flight and voice are said to be indistinguishable from those of the Common Indian Blue Rock and like them to furnish good shooting and capital eating.

(1858) Columba leuconota leuconota.

THE WHITE-BELLIED OR SNOW-PIGEON.

Columba leuconota Vigors, P. Z. S., 1832 p. 16 (Nepal); Blanf. & Oates, iv, p. 32 (part.).

Vernacular names. *Bujul* (Chamba).

Description. Edge of eyelids white; rest of head and upper neck slaty-grey, practically black where it joins the white nuchal collar; this collar gradually shades into the light brown of the upper back, scapulars and innermost lesser wing-coverts and secondaries; lower back white; rump and upper tail-coverts black; tail slaty-black at the base, followed by a broad white band and broadly tipped black on the central feathers and more and more narrowly on each succeeding pair outwardly; wings grey with three visible bands of brown formed by the brown bases of the greater and median coverts and secondaries, a fourth concealed band on the median coverts; primaries dark grey, browner at the tips and narrowly edged with silver-grey; outer secondaries grey at the base and brown on the terminal halves; quill-shafts dark brown.

Colours of soft parts. Iris golden-yellow; bill black; legs and feet bright scarlet-red, the soles paler and the claws black. "Mouth bright fleshy-red" (*Hume*).

Measurements. Wing 216 to 244 mm.; tail 125 to 138 mm.; tarsus about 29 to 31 mm.; culmen about 16 to 17 mm. "Weight 10 oz." (*Hume*).

Young birds have narrow pale buff margins to the feathers of the upper parts and wings; the white of the underparts is sullied with buff.

Distribution. Throughout the Himalayas from Afghanistan to Western Ladak and South to Garhwal and Sikkim *. West it breeds in Afghanistan and it has been recorded as breeding as far North as the Altai.

Nidification. The Snow-Pigeon breeds in colonies throughout its habitat between 10,000 and 12,000 feet and less often a thousand feet higher or lower. The colonies are often of considerable size. The nests are placed in crevices or caves in the face of cliffs and sometimes on ledges of rock, being made of sticks, grass, straw, feathers, etc., well interlaced or matted together and nearly always very dirty and verminous. The nests are apparently made use of year after year, though a little repairing may be done or a little superstructure added. The eggs, two in number, Rattray once took three, are of the usual Pigeon character, though often much stained. Twenty-five average 38·2 × 28·0 mm.: maxima **42·8 × 29·3** and 40·8 × **31·2** mm.; minima **34·6 × 26·3** mm.

* Sikkim is the meeting-place of the two races, where they grade into one another, but the typical form seems to penetrate further East at the lower levels, 9,000 feet, than it does at the higher levels.

Habits. The Snow-Pigeon is resident wherever found, though it may leave the highest elevations in Winter, at which season it also descends lower than it breeds in Summer. Peneau found it at 5,000 feet in Chitral and Ward records it down to 7,000 feet in Kashmir. It consorts in very large flocks, haunting steep cliffs, rocky ravines and valleys and feeding on berries, grain, buds and shoots of certain plants. Finn describes its note as "not a coo, but a repeated croak, not unlike a hiccough." Where the habitat of the Blue Rock-Pigeon and the Snow-Pigeon overlap, the two sometimes mingle in the same flock and feed and roost together. It is said that when Snow-Pigeons are feeding on ground among patches of snow they are singularly inconspicuous and difficult to detect.

(1859) Columba leuconota gradaria.

THE TIBETAN SNOW-PIGEON.

Columba leuconota gradaria Hartert, Nov. Zool., 1916, p. 85 (Szetchuan).
Columba leuconota. Blanf. & Oates, iv, p. 32 (part.).

Vernacular names. *Lho-peu-rentiep* (Lepcha); *Bya-don* (Bhut.).

Description. Head paler and more slate-grey than in the Western Snow-Pigeon; the mantle paler and more grey, less brown; the wing-coverts are also paler.

Colours of soft parts as in the preceding bird.

Measurements. Wing 239 to 262 mm.

Distribution. North-West China, Szetchuan and Kansu, South Tibet and West to Sikkim; Yunnan.

Nidification. I have eggs of this race taken from Eastern Tibet and others taken from "near Gyantse," probably between Rhamtso Lake and Gyantse, said to have been taken from nests in cliffs similar to those of the preceding bird. Capt. Stein, I.M.S., was the first to take the eggs, which he sent to Dresser; these also were taken "near Gyantse" and since then they have been taken in great numbers from further South. The eggs only differ from those of *C. l. leuconota* in being larger on an average, twenty eggs averaging 30·9 × 28·9 mm.

Habits. Similar to those of the preceding bird. Bailey found this bird mixing with the Rock-Pigeon on the Gyantse Plain * and records eight being shot there.

Columba œnas.

Columba œnas Linn., Syst. Av., 10th ed., i, p. 162 (1858).

Type-locality: Sweden.

* Meinertzhagen's remarks on this Pigeon ('Ibis,' 1927, p. 619) were probably written in India, where he had no access to the literature on the subject.

The typical form is much larger than our Indian and differs in having a grey instead of a vinous head, as well as in having a less conspicuous neck-patch. Hartert gives this bird specific rank but I consider it only a subspecies of *œnas*. Intermediate forms are not infrequent and the differences are all those of degree only.

(1860) Columba œnas eversmanni.

THE EASTERN STOCK-PIGEON.

Columba eversmanni Bonaparte, Compt. Rend., xliii, p. 838 (1856) (Central Asia); Blanf. & Oates, iv, p. 31.

Vernacular names. *Kamar-Kulur* (Hind.); *Ban-Parawa*, *Bagar* (Bihari); *Pahari Kabutar* (Hind., Lucknow); *Kaputh*, *Char-i-kaputh* (Baluchi); *Kaftar* (Persian).

Description. Upper part of the head and neck ashy-grey, tinged with vinous or lilac; cheeks, ear-coverts, lores, chin and throat dove-grey; the three first sometimes tinged lilac; hind-neck and interscapulars ashy-grey, glossed with green and a little lilac-red; sides of neck the same but with a well-marked patch of glossy purple-red; back and scapulars greyish-ashy; lower back pure white; rump and upper tail-coverts slaty-grey, the feathers margined with dark brown; tail brownish-black at the tip, slate-grey at the base with a dark band on all but the central feathers about 35 mm. from the tip; outer webs of outermost rectrices white below the black tip; wing-coverts dove-grey, all except the primary-coverts margined with ashy-grey like the back; bases of median and greater secondary coverts black, showing as two bars across the wing; primaries and outer secondaries ashy-grey, the base of the inner web of the first primary white, inner secondaries like the back but with a broad basal bar of black; breast dove-grey, strongly washed with lilac or vinous-pink; abdomen and under tail-coverts grey, darkest on the latter; axillaries and under wing-coverts white; edge of wing grey.

Colours of soft parts. Iris light yellow or golden-yellow to golden-brown; bill pale greenish, slaty at the base, amber-green at the tip; legs and feet pale fleshy- or yellowish-pink to purplish, nails horny-brown.

Measurements. Total length about 280 to 305 mm.; wing 190 to 210 mm.; tarsus about 24 to 25 mm.; culmen 15·5 to 18·5 mm. With the exception of one Turkestan specimen there are none with a wing of over 204 mm.

Distribution. West Siberia to Turkestan, East Persia, Afghanistan and Baluchistan, migrating in Winter into North-West India, as far East as Bihar and South into Sind, the Southern Punjab and United Provinces.

Nidification. This Pigeon breeds in May and June, making the usual Pigeon's nest of sticks, better put together than most and placed high up in a tangle of branches or on a stout branch.

Poplars seem to be favourite sites. An egg taken by Barnes in Afghanistan measures only 34·3×26·1 mm. but others sent me by Kuschel from Eastern Turkestan measure from 37·7×28·0 to 40·0×29·2 mm.

Habits. This Pigeon is only a Winter visitor to India but often often appears in very large numbers, moving about from place to place as various food-crops ripen and attract them. They often collect in huge flocks when roosting at night or during the great heat of the day and in feeding sometimes do serious injury to crops. They are both grain and fruit eaters and greedily eat many kinds of nuts. In the Kurram Valley Whitehead noticed them during the Spring migrations feeding on the ripe mulberries. Like their Western cousin they are good birds for the table and, though rather tame and confiding, fly well and strongly, sometimes furnishing good sport.

Columba palumbus.

Columba palumbus Linn., Syst. Nat., 10th ed., i, p. 163 (1758).

Type-locality: Sweden.

The Western race differs from our Indian bird in having white or creamy-white neck-patches instead of dark creamy ones.

(1861) Columba palumbus casiotis.

THE EASTERN WOOD-PIGEON OR RING-DOVE.

Palumbus casiotis Bonaparte, Consp. Gen. Av., ii, p. 42 (1854) (Himalayas); Blanf. & Oates, iii, p. 34.

Vernacular names. *Dahnud* (Hind., Chamba).

Description. Whole head and neck dark grey, the chin and throat sometimes slightly paler; lower hind-neck glossed with green or purple-copper according to the light; a broad buff semi-collar on the lower neck, interrupted at the back; below these buff patches the neck is glossed with green and purple; upper back, scapulars and wing-coverts light earth-brown changing to grey on the outer coverts; outermost secondary coverts pure white on the outer webs and those next them with a white edge forming two oblique bands of white across the wings; edge of shoulder of wing and primary coverts dark brown, the inner ones grey on the inner webs and edged white; primaries and outer secondaries slaty-black, edged white; lower back, rump and upper tail-coverts dark ashy-grey; tail brownish-black with a broad grey band across the middle, obsolete on the central feathers; breast vinous-pink, paling to dove-grey on the abdomen, flanks and under tail-coverts; tail below black with a broad white band across the middle.

Colours of soft parts. Iris pale yellowish-white to pale yellow; base of bill carmine-orange or orange-red, livid white in the centre and orange at the tip, cere whitish; skin round eye carmine-red; legs and feet coral-red, not very bright.

Measurements. Total length about 400 to 430 mm.; wing 243 to 263 mm.; tail 139 to 153 mm.; tarsus about 24 to 27 mm.; culmen about 16·5 to 18 mm.

Distribution. South Persia, Turkestan, Afghanistan, Kashmir and the Himalayas East to Sikkim; in Winter moving South to Sind, the North-West Frontier Province, Punjab and Oudh.

Nidification. Within our limits this Pigeon breeds in Kashmir and Kuman, though there is practically nothing on record, whilst Marshall, Cock, Rattray and others have found it breeding about Murree. Outside India it breeds in numbers in Afghanistan and all along the frontier from 2,500 to 12,000 feet and possibly higher than this. Barnes took eggs in Afghanistan in June, Rattray at Murree in May and June, whilst there are eggs in the Cox-Cheeseman collection taken during this month at Rustem. Ten eggs average 40·3 × 29·4 mm.: maxima **42·0** × 28·8 and 41·0 × **30·0** mm.; minima **38·8** × **28·7** mm.

Habits. This Wood-Pigeon seems to be a resident bird, though moving a great deal locally according to food-conditions and curiously enough never apparently breeding either in Garhwal, the Simla States or, practically, between the Ganges and the Jamna. In flight, voice, food etc. it does not differ from its European cousin.

(1862) Columba elphinstonii.

THE NILGIRI WOOD-PIGEON.

Ptilinopus elphinstonii Sykes, P. Z. S., 1832, p. 149 (Nilgiris).
Alsocomus elphinstonii. Blanf. & Oates, iii, p. 36.

Vernacular names. None recorded.

Description. Head above, nape and sides of neck dove-grey, faintly glossed with iridescent emerald-green; forehead, sides of head and lores the same but paler and tinged with pink; hind-neck with a large patch of black feathers tipped with white and with a tiny metallic edging below these tips; the posterior feathers glossed with green; back brick-red brown, gradually getting more brown and less red towards the rump; upper back and base of hind-neck glossed with purple-copper, showing green here and there; rump, upper tail-coverts and tail blackish-brown, the feathers of the rump obsoletely edged with metallic green; wings dark brown, in very fine specimens the lesser wing-coverts are like the back and the median and inner greater coverts are edged with brick-red; occasionally the scapulars and innermost secondaries are powdered with red; chin and centre of throat whitish; neck below and breast

ashy-grey or grey tinted with vinous, the feathers edged with metallic emerald-green, sometimes obsolete; abdomen paler and more vinous; flanks, axillaries and under aspect of wings darker; under tail-coverts brownish-ashy.

Colours of soft parts. "Corneous part of bill and claws horny-white; fleshy part of bill, eyelids, legs and feet pink; irides pale yellowish-red to red-brown" (*Davison*). "Eyelids, legs and feet lake-red" (*Davison*). "Bill brick-red at base" (*Cockburn*).

Measurements. Total length 380 to 430 mm.; wing 204 to 224 mm.; tail 152 to 178 mm.; tarsus about 25 to 26 mm.; culmen about 15 to 17 mm.

Distribution. Confined to the Hill-tracts of South-West India from Kanara to Cape Comorin. Col. Sykes obtained it in the Deccan Ghats, where, however, it is rare. Captain Blaxland's report of its occurrence on the Mahanadi and Godavery Rivers has never been confirmed.

Nidification. This Pigeon breeds in some numbers on the Nilgiris in April, May and June from 5,000 feet upwards; in Travancore it breeds as low down as 4,000 feet and on the Palnis and Shevaroys at about the same elevation. The nests are the usual rough saucers of twigs and though Miss Cockburn found a few nests "on lofty trees," it generally builds them on high leafy bushes or small saplings under, rather than over, fifteen feet. The bush or tree selected is one in "sholas" or spinneys and small woods, less often in dense or deciduous forest. Only one egg is laid, nine of which average 38·4 × 28·8 mm. and most eggs are broader ovals than is usual with this Subfamily.

Habits. This Pigeon is found singly, in pairs or in quite small flocks, frequenting woodlands and forest, feeding on various fruits and buds. It is said also to descend to the ground and feed on snails and Jerdon took "small Bulimi" from their crops. They are said to move about a great deal in their search for ripening fruit but they are in no way migratory. Its call is said to be the same soft sweet "coo" of the Common Ring-Dove and its flight also resembles that of that bird.

(1863) Columba torringtonii.

THE CEYLON WOOD-PIGEON.

Palumbus torringtonii Bonpte., Consp. Gen. Av., ii, p. 42 (1854) (Ceylon).
Alsocomus pulchricollis. Blanf. & Oates, iv, p. 36.

Vernacular names. *Nila-goya* (Cing., Cent. Provinces, Ceylon); *Mahrilla goya* (Cing. *apud* Layard).

Description. Differs from the preceding bird in having no brown on the mantle; the head and neck are grey, glossed with lilac; the neck-patch is smaller, the feathers tipped with white

instead of buff and with the green edges very fine or wanting; upper back glossed with lilac or copper-purple; remaining upper parts deep slaty, almost blackish-grey, the rump greyer; the lower neck and breast are reddish-grey glossed with a purple sheen; remaining underparts dull reddish-ashy, paler on the abdomen and darkest on the under tail-coverts.

Colours of soft parts. "Iris pale red: orbital skin dull pink; bill plumbeous, apical portion bluish; legs and feet pinkish-fleshy, toes and soles red; legs sometimes white with the fronts of the tarsus and tops of the toes reddish" (*Legge*).

Measurements. Wing 182 to 208 mm.; culmen 14·5 to 16·5 mm.

Distribution. Ceylon.

Nidification. Bligh records this Pigeon as breeding on lofty trees in forest in both Spring and Autumn as late as October and Mr. C. E. Butler took a single egg from a nest in a small tree in forest on November 11th. The egg measured 44·4 × 28·4 mm. Two eggs taken for me by Jenkins in January 1907 measure only 39·0 × 29·0 and 39·0 × 29·9 mm. and were taken from nests high up in tall trees in dense forest.

Habits. This is a forest-bird, keeping to high trees in dense forest. When the cinnamon fruit is ripe this is said to form its staple diet. Its flight is swift and powerful and its note a deep guttural "coo."

(1864) Columba pulchricollis.

THE ASHY WOOD-PIGEON.

Columba pulchricollis Hodgs., in Greys Zool. Misc., p. 85 (1844) (Nepal).
Alsocomus pulchricollis. Blanf. & Oates, iv, p. 37.

Vernacular names. *Hko* (Burmese); *Ka-o* (Lepcha); *Daohuk-uruma majungbi* (Cachari).

Description. Head and nape dove-grey, paler on the sides and faintly glossed with grey-green; chin and centre of throat white; a patch on the neck black, the feathers broadly tipped buff, paling to whitish on the extreme edges; the patch produced as a narrow buff collar round the fore-neck, paling to almost white on the lower throat; next to this collar the feathers are blackish-brown, highly glossed with green and purple, reaching back to the inter-scapulars; lower back and rump slaty-black, changing to slaty-grey on the shorter upper tail-coverts; longest tail-coverts and tail blackish-brown; wing-coverts plumbeous-brown, darkest next the back, palest on the outer greater coverts; primaries and secondaries dark brown, the second to the fifth primary narrowly edged with pale rufous; breast slaty-brown, changing to dull buff

on the abdomen and vent, the flanks washed with lilac-slate; under tail-coverts buff; axillaries and under wing-coverts blackish-brown.

Colours of soft parts. Iris pale yellow; bill livid at the base, yellow in the middle to the tip; cere tinged greenish; legs and feet deep coral- or purple-red, soles paler and claws horny-brown.

Measurements. Total length about 375 to 400 mm.; wing 194 to 216 mm.; tail 120 to 130 mm.; tarsus about 22 to 25 mm.; culmen 16 to 17 mm.

Distribution. Nepal, Sikkim and Tibet between 7,000 and 10,000 feet and possibly a good deal higher; the hills of Assam between 5,000 feet and the highest peaks, Shan States and Formosa. Robinson informs me that it is also found on the coast and islands of the North Malay Peninsula.

Nidification. Osmaston found this Pigeon breeding during May and June in some numbers in Darjeeling, building the ordinary form of Dove's nest in small trees in dense forest. Masson took an egg in the same district on the 11th June and I found a few pairs breeding in June on the highest ridges of the Barail range in Assam, making their nests in stunted trees in the oak-forest at 5,000 feet upwards; some of these nests were lined with a few feathers—a very curious character. One nest with an egg was taken in August, possibly a second brood. A single egg only is laid and five of these average 37·6×27·4 mm.: maxima **42·3×30·0** mm.; minima **37·0×27·0** mm.

Habits. This is one of the most shy of all the Pigeons, keeping much to densely-foliaged trees and, as it is also a very silent bird, it may be more common than it appears to be. I have only seen it in pairs or singly but Stevens saw them in large flocks apparently working South from Sikkim. It is, I think, a sendentary bird but may wander to lower levels during the Winter, though never into the plains. Its flight is like that of other Pigeons but, when starting, it descends instead of rising suddenly into the air, hence the loud clapping of the wings over the back is never heard as it is in the flight of the latter. They are great fruit-eaters and also eat millet, Indian corn and ripe rice and I found the crop of one bird full of tiny snails.

Genus **ALSOCOMUS**.

Alsocomus (Tickell), Blyth, J. A. S. B., xi, pt. 1, p. 461 (1842).

Type, *Alsocomus puniceus* Tickell.

The present genus is often included in the genus *Columba*, from which, however, it differs so extremely in colour that it seems desirable to keep it apart. Wings, tail and bill are as *Columba* but it has no neck-patch as in some of the species of that genus,

nor has it the strong gloss on the neck present in those species which have no wing-patch. From *Ianthœnas* it differs in having no naked space through the lores.

(1865) Alsocomus puniceus.

THE PURPLE WOOD-PIGEON.

Alsocomus puniceus (Tickell), Blyth, J. A. S. B., xi, p. 461 (1842) (Chyebasa); Blanf. & Oates, iv, p. 38.

Vernacular names. *Lali Pagooma* (Assam); *Daohukuruma koro-gôphu* (Cachari)

Description. Forehead, crown, nape and a line under the orbital skin greyish-white; sides of head and neck pale, dull chestnut-brown, greyish next the base of the lower mandible and



Fig. 31.—Head of *A. puniceus*. ½.

the black bases of the feathers often showing on the upper neck; back and scapulars rich deep chestnut, the feathers broadly edged with brilliant green and amethyst; rump and upper tail-coverts deep slaty-grey, almost black, the feathers, except the longest coverts, edged with amethyst; tail blackish-brown; visible wing-coverts rich chestnut-brown, the lesser and median edged with amethyst; edge of wing and greater primary coverts blackish-brown; quills blackish-brown, the second primary edged with pale brown, the edge lessening until it disappears on the fifth or sixth primary; innermost secondaries like the back; lower plumage paler vinous-chestnut, darker on the thighs and vent and faintly glossed with iridescent green on the breast; under tail-coverts brownish-black.

Colours of soft parts. Iris creamy-yellow, orange-yellow to orange-red; the eyelids carnation-red; orbital skin pale purplish-pink; bill greenish or bluish-horny from tip to nostril and the angle of the gonys and thence to the forehead, with cere sanguineous-pink; legs and feet purple-red, soles paler and claws whitish.

Measurements. Wing, ♂ 210 to 236 mm., ♀ 203 to 225 mm.; tail 152 to 178 mm.; tarsus about 23 to 25 mm.; culmen about 16 to 17 mm. Weight 12¾ to 18 oz.

Young birds have the head unicolorous with the body and are generally duller in colour.

Young in first plumage are very dull and brown and have the wing-coverts and scapulars margined with rufous.

Distribution. Eastern Bengal, Assam, Burma, Indo Chinese countries and North Malay Peninsula. Layard apparently obtained a single specimen in Ceylon and Legge thought he saw a flock of these Pigeons near Borella in 1869.

Nidification. Oates found a nest of this bird containing a single egg on the 27th July in Pegu, whilst in Assam I took eggs in June and July and, very rarely, in May. All the nests were built in bamboo-clumps or small saplings, either in bamboo- and scrub-jungle or in evergreen forest. They breed from the foot-hills up to some 2,000 feet and also in the plains. Occasionally nests may be taken at 3,000 or 3,500 feet. Fifteen eggs average 37·6 × 29·2 mm.: maxima **41·5 × 32·5** mm.; minima **35·5 × 28·0** and 39·1 × **26·6** mm. Both sexes take part in incubation.

Habits. The Purple Wood-Pigeon is a bird of forests and thickly-wooded cultivated tracts alongside forest and is often found feeding in rice-fields after the crops have been cut and the ground has dried up. It is principally a fruit-eater but it is well known to the people of South Assam as a frequenter of their fields of millet and vetches and it seems particularly fond of ripe Indian corn. Tickell found it in small flocks in Eastern Bengal but I have never seen it except in pairs or alone. It flies swiftly and strongly with the usual deliberate wing-beats of the Pigeon tribe and it is also very active on the ground. Bingham describes the call as "a soft mew, not unlike that of *Carpophaga ænea*, only not half so loud or booming."

Genus **IANTHŒNAS.**

Ianthœnas Reichenbach, Nat. Syst. Vög., p. 25 (1852).

Type, *Columba janthina* Temm.

This genus is very close to *Alsocomus* but differs not only in colour and colour-pattern but also in having the nude space round the eye running in a bare strip from the eye to the base of the bill. The genus contains two species only.

(1866) **Ianthœnas palumboides** *.

THE ANDAMANESE WOOD-PIGEON.

Carpophaga palumboides Hume, Str. Feath., i, p. 302 (1873) (Andamans).
Alsocomus palumboides. Blanf. & Oates, iv, p. 39.

Vernacular names. None recorded.

* I cannot separate *Ianthœnas nicobarica*, which seems to have been founded on an immature bird. Other specimens from Ineenge, Trinkut and Nankowry, which are adult, are exactly the same as Andaman birds.

Description. Whole head a beautiful pearl-grey or pearl-white, showing a faint sheen of emerald-green on the crown and nape; upper neck darker and with more gloss; lower neck with a darker green gloss and with the black bases to the feathers showing through; remainder of upper parts and wing-coverts a deep slaty-grey, almost black, each feather edged metallic green, purple-copper or amethyst according to the light, the margins to the median coverts narrow and always green; greater coverts and quills blackish-brown, the second to the fourth and sometimes the fifth primary with a narrow edge of grey-brown to the outer web; tail blackish-brown; lower parts from neck to vent light slaty-grey with a faint emerald sheen; under wing-coverts, axillaries, flanks and under tail-coverts a rather darker grey.

Colours of soft parts. Iris orange, reddish-yellow or orange-pink; cere and base of bill lake-red or pinkish-lilac, remainder of bill yellowish-white or almost white; legs and feet fleshy-pink, more red in front, claws horny-white.

Measurements. Wing 241 to 258 mm.

"Weight 1 lb. 2 oz." (*Davison*).

Young birds have the head a much darker grey with less sheen and the upper parts duller and browner.

Distribution. Andamans and Nicobars.

Nidification. Unknown.

Habits. This is a forest Pigeon and according to Hume very like *Muscadivora* in its habits, frequenting the tops of the highest and most densely-foliaged tree but Davison and Butler both obtained specimens which were seated on very low branches or actually on the ground. Hume saw "hundreds" at a roosting-place on a conical rocky islet and also common in the Macpherson's Straits where they were flying over in small parties. They are fruit-eaters as far as is known and have a deep, loud "coo."

Genus **DENDROTRERON**.

Dendrotreron Hodgs. in Gray's Zool. Misc., p. 85 (1844).

Type, *Columba hodgsonii* Vigors.

This genus can at once be separated from all others of the Subfamily by its curious acuminate and rather lengthened feathers of the neck. The feet are intermediate between those of the Rock-Pigeons and Wood-Pigeons, whilst the tarsi are slightly feathered. The genus contains two species, one African and one Indian.

(1867) **Dendrotreron hodgsonii.**

THE SPECKLED WOOD-PIGEON.

Columba hodgsonii Vigors, P. Z. S., 1832, p. 16 (Nepal).
Dendrotreron hodgsoni. Blanf. & Oates, iv, p. 33.

Vernacular names. *Hagrani Daohukuruma* (Cachari); *Pahari Pagoona* (Assamese).

Description.—Adult male. Whole head, throat and neck and upper breast ashy-grey, the chin generally, and the throat sometimes, paler; on the lower neck and upper breast the bases of the feathers are blackish-grey, this colour increasing in extent and changing to claret-red posteriorly on these parts and on the back, scapulars and lesser wing-coverts to a claret-red or claret-maroon; longer scapulars, lower back and rump slaty-brown, the rump darkest and contrasting with the dark dove-grey shorter upper tail-coverts; longer tail-coverts and tail dark brown; median wing-coverts claret-red, speckled with white, gradually changing to a dark slaty-grey on the outermost and greater coverts; primary coverts and wing-quills dark brown; the feathers of the breast are dark claret bordered with grey, the borders narrower on the lower breast and passing away on the posterior flanks and showing only as pinkish grey spots on the abdomen; vent, thighs and under tail-coverts dark slaty-grey, merging into the red of the abdomen.

Colours of soft parts. Iris white or hoary-white; orbital skin livid or slate-colour; bill black, sometimes tinged livid or purple on the cere and base; legs and feet dull green, blackish in front and paler and more yellow behind.

Measurements. Length about 355 to 405 mm.; wing 228 to 244 mm.; tail 140 to 153 mm.; tarsus about 24 to 26 mm.; culmen 15·2 to 17·7 mm.

Adult female. Whole head greyish; the grey margins to the feathers of the lower parts are not tinged with pink and the upper parts are more brown less maroon; the red of the underparts is replaced by a dark grey-brown.

Distribution. Himalayas, Kashmir to Tibet and Assam, Manipur, Chin and Lushai Hills into the Shan States.

Nidification. Six eggs taken in Nepal during May and June were all built on small trees in dense forest in extreme Western Nepal near the Sikkim Frontier. The elevation varied from 8,000 to 10,000 feet but in Assam I took two nests at about 6,000 feet. Each nest contained but one egg. In Kishtwar Ward says it breeds at 8,000 feet and it also breeds at about this level near Sonamarg in Kashmir. The eggs vary in size between 33·9 × 25·9 mm., an abnormally small egg, and 41·5 × 29·4 mm. Eight eggs average 39·3 × 30·1 mm., excluding the smallest.

Habits. This Pigeon is a bird of high-level forests between 8,000 and 11,000 feet, whilst Elwes got it at 13,000 feet in Sikkim. In the Assam hills it occasionally breeds as low as 6,000 feet and it comes about 1,000 feet lower than this in Winter all through its range. It collects in small parties at this season, feeding on trees on fruits and berries and seems especially fond of acorns. They also feed on the ground in the patches of hill-rice cultivation and eat rice when ripe. The note is a very deep one, sounding like "whock—whr-o-o—whrroo."

Genus STREPTOPELIA.

Streptopelia Bonaparte, Consp. Gen. Av., ii, p. 63 (1854).

Type, *Columba risoria* Linn. = *S. decaocta* Frivalsky.

In general appearance the birds of this genus may be known by their small size, comparatively small head and slender neck, weak narrow bill and by their comparatively long narrow wing, of which the second and the third primaries are the longest; the tail exceeds two-thirds the length of the wing but is never longer and is considerably graduated; the toes and tarsi are formed for walking, the former being narrow and the latter strong though short.

The sexes are alike in plumage and all the species are of grey or brown colour with a dense collar or patch of pied feathers on the neck.

Some forms are resident, others migratory.

Since 1908, when 'Indian Pigeons and Doves' was written, a considerable advance has been made in our knowledge of this group and the separation of species and subspecies then made has to be greatly modified. I now recognize five species, which are all divided into several races.

Key to Species.

A. A patch of black feathers on either side of the neck, divided on the nape.	
a. Tips to feathers of neck-patch white	*S. turtur*, p. 236.
b. Tips to feathers of neck-patch grey	*S. orientalis*, p. 238.
B. A collar of black feathers on *the back of the neck*, each feather ending in a double white spot	*S. chinensis*, p. 241.
C. A collar of black feathers, with rufous tips round *front of the neck*	*S. senegalensis*, p. 245.
D. A collar of *plain* black feathers round back of the neck	*S. decaocto*, p. 247.

Streptopelia turtur.

Key to Subspecies.

A. Darker and duller with more vinous on the underparts	*S. t. turtur*, p. 236.
B. Paler and brighter with the abdomen more extensively white	*S. t. arenicola*, p. 237.

(1868) Streptopelia turtur turtur.

The Turtle-Dove.

Columba turtur Linn., Syst. Nat., 10th ed., i, p. 164 (1754) (England).
Turtur communis. Blanf. & Oates, iv., p. 42 (part.).

Vernacular names. *Tarul-ghu* (Turki).

Description. Head from forehead to hind-neck ashy-grey; a patch of black feathers on either side of the base of the neck,

each feather edged with white; upper back pale brown but varying much in tone and with the grey of the neck sometimes encroaching between the scapulars; lower back, rump and upper tail-coverts ashy-brown, in some cases more grey than in others, especially on the lower back and sides of the rump; central tail-feathers brown, very narrowly tipped with white or fawn-white; remaining feathers slaty-black with a broad terminal band of white, this extending to the whole outer webs of the outermost pair; scapulars, lesser and inner median coverts and innermost secondaries brownish-chestnut or cinnamon, with bold black centres finely edged with grey; remaining coverts grey; quills brown narrowly edged with whitish and the outer secondaries more ashy on their bases; chin, sides of head and throat pale vinous, albescent on the chin but often more fulvous on the throat, changing to deep vinous on the breast and to white on the centre of the abdomen, vent and under tail-coverts; under wing-coverts, axillaries and flanks dark grey, under aspect of tail black with broad white terminal band.

Colours of soft parts. Iris orange, orange-red or orange-brown; eyelid reddish-brown, orbital skin purple-brown; bill greyish or slaty-black, the gape purple-red; legs and feet purple or reddish-purple, the soles paler and claws horny-brown.

Measurements. Total length about 280 to 300 mm.; wing 165 to 184 mm.; tarsus about 17 to 19 mm.; culmen 16 to 17 mm.

Young birds are browner and duller, the neck-patches are obsolete and the black centres are less developed on the wing-coverts and absent on the scapulars.

Distribution. Europe, North Africa and Western Asia. A specimen obtained by Swinhoe in Quetta is inseparable from the European bird.

Nidification. The Turtle-Dove breeds from April to June, principally in May, laying two white eggs in a flimsy nest of sticks built in dense high hedges, trees or bushes. Jourdain gives the measurements of ninety-five eggs as follows:—Average 30·6 × 22·9 mm: maxima **33·4** × 23·8 and 31·6 × **24·8** mm.; minima **27·7** × 22·0 and 28·6 × **20·0** mm.

Habits. The Turtle-Dove is a migratory bird wandering far in Winter and possibly other specimens may be found in North-West India and Sind. It is a bird of the open country, feeding much on the ground, running well and with a strong quiet flight. It is, of course, exclusively vegetarian, feeding on seeds, grain, fruit and buds. Its note is a soft, low, rather rippling "coo."

(1869) Streptopelia turtur arenicola.

THE PERSIAN TURTLE-DOVE.

Turtur turtur arenicola Hartert, Nov. Zool., 1894, p. 42 (Fao, Persia).
Turtur communis. Blanf. & Oates, iv, p. 42 (part.).

Vernacular names. *Turul ghu* (Turki).

Description. Similar to the preceding bird but much paler and more brightly coloured; the upper back and adjoining parts are bright pale cinnamon; the vinaceous tint of the lower parts paler and cleaner; the black-patch feathers more broadly edged with pale grey.

Colours of soft parts as in the European Turtle-Dove.

Measurements. Wing 161 to 181 mm.; "weight 4·4 oz." (*Scully*).

Distribution. Southern Persia, Arabia, Palestine, Mesopotamia, Afghanistan, Baluchistan, Yarkand, Gilgit and the borders of the North-West Provinces.

Nidification. Scully[1] found this Dove breeding freely during May and June in Yarkand, making a frail nest like that of its European cousin in willows and other trees, some 7 to 10 feet from the ground. Cumming took a good many eggs at Fao in June and Cox and Cheeseman found it breeding in large numbers in Bagdad in the same month. Twenty-eight eggs average 29·9 × 22·4 mm.: maxima 31·4 × 22·3 and 30·3 × 23·0 mm.; minima 29·0 × 21·2 mm.

Habits. Those of the species.

Streptopelia orientalis.

Key to Subspecies.

A. Under tail-coverts pale dove-grey; abdomen albescent; wing 190 to 199 mm. ..... *S. o. orientalis*, p. 238.
B. Under tail-coverts white; abdomen white over a greater extent; wing 169 to 200 mm. *S. o. ferrago*, p. 239.
C. Under tail-coverts dark grey; abdomen rufous; wing 162 to 182 mm. ..... *S. o. meena*, p. 240.

(1870) Streptopelia orientalis orientalis.

THE RUFOUS TURTLE-DOVE.

Columba orientalis Lath., Ind. Orn., ii, p. 606 (1790) (China).
Turtur orientalis. Blanf. & Oates, iv, p. 40 (part.).

Vernacular names. *Kala Fukhta*, *Barko Fukhta* (Hind.); *Yedra poda gura* (Tel.).

Description. Head and neck brown suffused with vinous and the crown and forehead more grey, a patch of black feathers edged with silver-grey on either side of the back of the neck; upper back brown, each feather edged with rufous; lower back and rump slaty-grey, the feathers with concealed dark centres; upper tail-coverts brown; central tail-feathers the same, tipped paler; outer rectrices darker brown with broader grey tips and the outermost greyish-white on the outer web; scapulars, inner wing-coverts and inner secondaries dark brown with broad ferruginous edges; outer median and greater coverts dark slate-grey;

primaries and outer secondaries blackish-brown with narrow pale edges; lower parts vinous-rufous, the chin and centre of the throat albescent, the abdomen paler with the centre often pale grey; vent, flanks, under wing-coverts, axillaries and under tail-coverts pale grey.

Colours of soft parts. Iris orange to pale red; bill dusky horny or plumbeous, the cere, gape and eyelids purple; orbital skin dull plumbeous, rarely tinged with purple; legs and feet lake-red to purple-red.

Measurements. Total length about 300 to 320 mm.; wing 190 to 200 mm.; tail 132 to 152 mm.; tarsus about 22 to 25 mm.; culmen 17 to 18 mm. Scully gives the wing-measurements as 185 to 220 mm.

Young birds are paler and duller brown with no grey on the head or rump, from forehead to tail each feather is narrowly edged with dull rufous; the underparts are dull, pale, smoky-brown, the feathers edged with yellowish-rufous; the under tail-coverts are barred with black near the tips, which are rufous.

Nestlings in down are pale buff.

Distribution. Sikkim, Tibet and the Himalayas, North of Assam to Setchuan and thence to Manchuria, Corea and Japan. In Winter it occurs over the greater part of Eastern India as far West as the Deccan and possibly the Bombay Presidency but, in the North, not West of the United Provinces.

Nidification. In Japan and Manchuria this Dove breeds from May to July, generally having two broods; in Tibet Messrs. Steen, Kennedy and others took many eggs in June and July at elevations up to 14,500 feet and in Sikkim it seems to breed down to 8,000 feet, below which elevation *S. o. agricola* seems to take its place. The nest seems to be generally built on bushes, willows and low trees between 8 and 20 feet from the ground. Twenty-six eggs average 34·2×24·5 mm.: maxima **35·1**×25·1 and 34·3×**26·0** mm.; minima **32·4**×24·2 and 34·8×**24·1** mm.

Habits. Scully found this to be a forest-bird in Nepal, being common below 7,000 and 8,000 feet in Summer. Elsewhere it seems to be more a bird of well-wooded open country, scrub-jungle and thin forest. In habits generally it closely resembles its better-known Indian race.

(1871) Streptopelia orientalis ferrago.

THE NORTHERN INDIAN RUFOUS TURTLE-DOVE.

Columba ferrago Eversmann, Add. ad. Zoog. Ross.-As. fasc., iii, p. 17 (1842) (Singaria).
Turtur ferrago. Blanf. & Oates, iv, p. 41.

Vernacular names. *Koin* (Chamba); *Kullah* (Bihari); *Lal Panduk* (Hind.); *Pahari Perki* (Lucknow); *Ram ghugu* (Beng.); *Lali-kopu-hu* (Assam); *Hargrani Daotu* (Cachari).

Description. Similar to the preceding bird but much paler, the chin and centre of the throat are whiter; the whole of the abdomen from the breast downwards is white or nearly so; the under tail-coverts are white and the axillaries and under wing-coverts a paler, purer grey.

Colours of soft parts as in other races.

Measurements. Wing 169 to 200 mm., but nearly always over 175 mm.

Distribution. Western Central Asia, Turkestan, Persia, Afghanistan and the Himalayas as far East as West Nepal and then through the lower levels to Sikkim up to 8,000 feet above which the preceding bird takes its place. Stevens records this form down to 4,500 feet in "early summer" but not then breeding whilst birds shot by him at about 7,000 feet were all intermediate between this and the last race. Rothschild accepts Anderson's record of this race for Yunnan.

Nidification. This is a very common breeding-form all through its summer range but apparently nowhere at great heights. Whymper and Osmaston found nests at nearly 9,000 feet in Garhwal. Ward has taken them up to 8,500 in Kashmir and Whitehead at about the same height on the N.W. Frontier. The nests are generally built in forests, sometimes in orchards and open country, but nearly always in trees quite low down, whilst Pitman records taking eggs from a hollow in the side of a tree-trunk, with no nest of any kind whatsoever.

Many of the eggs recorded by Oates ('Nests and Eggs') as of this bird are doubtful, but forty eggs from my own collection average 32·2 × 23·9 mm.: maxima **34·6** × 23·0 and 32·3 × **25·3** mm.; minima **28·9** × 23·4 and 34·6 × **23·0** mm.

They lay principally in May and June, less often in July.

Habits. Differ in no way from those of the last bird. In Winter these Doves are found over practically the whole of Western and South India and have twice been recorded from Ceylon.

(1872) Streptopelia orientalis meena.

THE INDIAN RUFOUS TURTLE-DOVE.

Turtur meena Sykes, P. Z. S., 1832, p. 149 (Deccan).
Turtur orientalis. Blanf. & Oates, iv, p. 40 (part.).

Vernacular names. *Kalo fakhta, Barko fakhta* (Hind.); *Sam ghugu, Ram ghughu* (Beng.); *Daotu-gajao* (Cachari); *Puko* (Assam); *Inrui ku* (Naga); *Veh-gura* (Kuki).

Description. Similar to *S. o. orientalis* but much more darkly and richly coloured; the head has much less grey; the vent, thighs and under tail-coverts are a darker slaty-grey; the lower parts are more ferruginous and the centre of the belly is not albescent.

Colours of soft parts as in other races.

Measurements. Wing 162 to 183 mm.

Distribution. Bengal, Orissa, Bihar, Assam and throughout Burma to Tenasserim. In India it is found as far West as Chota Nagpur extending through the Bhutan Terai into the lower ranges of Sikkim and I have seen typical breeding-birds from Darjeeling, though here most individuals are intermediate this district forming the meeting-place for all three races as breeding-birds. In Winter it may straggle far, there are two specimens from Mahableswar in the British Museum collection and it occurs and breeds both in the Deccan and the Central Provinces.

Nidification. This little Dove breeds practically throughout the year, having two or often three broods. In Sambalpur most eggs are laid from December to March; in Assam and Bengal from March to May and June and in Burma February to April. The nests are typical of the family but have more of a hollow for the eggs than most Doves' nests though they are as fragile and flimsy as usual. The favourite nesting-site is a thick bush, cane-brake or small tree, but I have taken them from bamboo-clumps and, very rarely, high trees. Eighty eggs average 28·4 × 22·4 mm.: maxima **31·7** × 22·4 and 30·5 × **24·3** mm.; minima **25·4** × 20·7 and 26·4 × **19·8** mm.

In Sikkim and the Assam Hills this Dove breeds up to some 6,000 feet but in the hills South of the Brahmapootra rarely up to 4,000 feet.

Habits. The Indian Rufous Turtle-Dove is a resident bird over most of its habitat but it deserts the higher hills in Winter and, on the other hand, wanders further South and West during that season. These birds are very sociable and often feed together in large numbers; Blewitt and Jerdon speak of large flocks but such I have never seen, the presumed flocks always breaking up into pairs when disturbed. They are better eating than any of the Pigeons and sometimes give very good sport when feeding in the rice-fields as they are quick to rise and very fast on the wing. Their note is a deep rather guttural "coo" repeated thrice; in addition Blewitt says that when irritated they utter a "loud hissing kind of note." They feed principally on grain and seeds but eat many kinds of fruit and also the shoots and buds of certain plants.

Streptopelia chinensis.

Columba chinensis Scop., Del. Flor. et Faun., Insubr., p. 94, No. 90 (1844) (China).

Key to Subspecies.

A. Wing over 130 mm.
  a. Wing-coverts marked with vinaceous patches.
    a'. Back distinctly and boldly spotted with pale rufous ..... *S. c. suratensis*, p. 242.
    b'. Back spotted very indistinctly or not at all ..... *S. c. tigrina*, p. 244.
  b. Wing-coverts marked with rusty-red .. *S. c. forresti*, p. 244.
B. Wing under 130 mm. ..... *S. c. ceylonensis*, p. 245.

(1873) Streptopelia chinensis suratensis.

THE INDIAN SPOTTED DOVE.

Columba suratensis Gmel., Syst. Nat., i, p. 778 (1789) (Surat).
Turtur suratensis. Blanf. & Oates, iv, p. 43.

Vernacular names. *Chitroka fakhta, Chitta fakhta, Perki, Chitta, Kangs-kiri, Panduk* (Hind.); *Chaval ghughu, Telia ghughu* (Beng.); *Kawal* (Mahr.); *Bode* (Gond.); *Poda-bella-guwa* (Tel.); *Pulipora* (Tam.); *Ko-pu-ku, Pati-kopa* (Assam); *Kodaya-Punduk* (Bihar); *Daotu* (Cachari); *Inruigu* (Naga); *Voh kurup* (Kuki).

Description. Upper portion of head and nape vinous; more grey on the forehead and above the eye; a small black mark between the eye and the base of the bill; a dense collar of black on the sides and back of the neck, each feather bifurcate and with two white spots at the tip: on the upper back the velvety black changes to brown and the spots from pure white to rufous; the bifucations become less pronounced till they cease on the lower back where the spots become narrow terminal bars; lower back and rump brown with narrow rufous fringes; upper tail-coverts slaty-brown, bifurcated and tipped narrowly with brown and subtipped rufous, the latter sometimes obsolete; central tail-



Fig. 32.—Foot of *S. c. suratensis.*

feathers brown, obsoletely barred darker; the next pair almost black with broad terminal band of dark slate; each succeeding pair has the base darker and the terminal band wider and paler grey until the outermost has the basal half black and the terminal half almost white, running down the edge of the outer webs towards the base; scapulars and innermost secondaries like the back but with larger spots, paler and tinged with vinous; lesser and median wing-coverts grey-brown with large terminal spots of vinous, divided by a streak of dark brown; shoulder of wing more grey and less spotted; greater coverts grey; edge of wing, primary coverts and quills dark brown, the primaries and outer secondaries edged with grey; chin white; centre of throat albescent; sides of head, throat, breast and flanks vinaceous-pink, centre of abdomen, vent and under tail-coverts white, the latter with a V-shaped spot near the tips.

Colours of soft parts. Iris, two rings, the inner pure hazel, the outer hazel-red; eyelids and narrow bare orbital space red; bill dark horny- or plumbeous-brown; legs and feet dull red or purplish-red, claws horny-brown.

Measurements. Total length about 280 mm.; wing, Northern India 135 to 148 mm., South India 128 to 143 mm., rarely under 132 mm., except in Travancore; tail 133 to 142 mm.; tarsus about 22 mm.; culmen 12·5 to 14·5 mm.

Young birds are paler and browner, with no nuchal patch; the upper parts are barred instead of spotted; the wing-coverts edged with rufous and the lower parts fulvous-brown, the breast with narrow fringes of pale fulvous.

Distribution. Throughout the whole of India and in the Himalayas up to 7,000 feet. Assam birds are of this race, whilst Cachar and Manipur birds are intermediate between this and *tigrina*. In the Bengal districts East of the Bay *S. c. tigrina* replaces *S. c. suratensis*. In Sind it only occurs in wet seasons. Birds from South Travancore are near *S. c. ceylonensis*, wing 128 to 133 mm.

Nidification. The Spotted Dove breeds in every month of the year. In the plains of Bengal March to June and again September and October are the principal breeding-months; in Southern India most birds lay from October to April and in the higher hills from February up to September; in the Himalayas mostly from April to July. It builds its nest in trees, bushes, verandahs and eaves of occupied buildings, stables and outhouses and in all sorts of unexpected corners. Nor does it matter much where the tree or bush is, unless it is in deep forest. Thin forest, scrub- and bamboo-jungle, gardens or bare cultivated land are equally agreeable to it. Generally its nest is placed low down in bush, tree or building but occasionally high up in a Mango or other large tree. The nest itself is the ordinary tiny saucer or platform built by all members of this family and, according to Thompson, contains fifty to one hundred and fifty pieces of twigs and roots. One hundred eggs average 27·2 × 21·8 mm.: maxima **29·7** × 22·4 and 28·2 × **24·1** mm.; minima **25·0** × 19·5 and 27·8 × **19·1** mm.

Habits. The Spotted Dove is one of our most familiar Indian birds all over India except in the very arid regions such as Sind and parts of the Deccan. Given a sufficient water-supply it may be found anywhere up to 8,500 feet, though not often breeding over 7,000 feet. It is a most tame and confiding little bird, running about freely in gardens and villages or searching the roads for fallen grain and seeds, generally hunting in couples and constantly calling to one another in the softest and sweetest of coos. Their flight is swift and powerful and they rise from the ground with the usual fuss and clatter of wings over their backs so often heard in Pigeons' flight. They eat grain, fruit, seeds and termites and, when breeding in houses, they often take scraps of potato, bread and other oddments thrown to them by the servants. They also furnish an excellent item of food themselves when needed.

(1874) Streptopelia chinensis tigrina.

THE BURMESE SPOTTED DOVE.

Columba tigrina Temm., Les Pigeons, p. 94 (1810) (Java).
Turtur tigrinus. Blanf. & Oates, iv, p. 44.

Vernacular names. *Gyo*, *Gyo-té-byonk* (Burm.); *Nok-kao-yai* (Siam).

Description. Differs from the Indian Spotted Dove in having no rufous spots on the back, whilst those on the wing-coverts, scapulars and inner secondaries are absent or obsolete; the outer webs of the median coverts are pale vinous-brown and the greater coverts are the same with pale grey edges instead of all grey as in *S. c. suratensis*; the white on the underparts is less and is often replaced with pale fulvous-brown.

Colours of soft parts as in the other races. Sambawa birds are said to have the iris bright pale yellow and those from Menado and Talisse Islands brown.

Measurements. Wing 137 to 155 mm.

Distribution. Bengal, East of the Bay; Burma, Siam, Malay Peninsula, Sumatra to Tenier and Moluccas. Cachar birds are intermediate.

Nidification. The Burmese Spotted Dove breeds practically all the year round and in similar situations to those selected by the last bird. Twice, however, Mr. C. W. Allan found nests of this bird actually on the ground, composed of a few sticks placed on the top of fallen leaves and with no attempt at concealment. Fifty eggs average 27·6×21·9 mm.: maxima **37·7**×21·0 and 27·6×**23·8** mm.; minima **26·0**×22·0 and 27·4×**19·3** mm.

Habits. Similar to those of the preceding bird.

(1875) Streptopelia chinensis forresti.

THE YUNNAN SPOTTED DOVE.

Streptopelia chinensis forresti Rothschild, Nov. Zool., xxxii, p. 293 (1926) (Tenguch, Yunnan).

Vernacular names. None reported.

Description. "Differs from *S. suratensis*, greyer, less brownish, head and neck; in the less distinct rusty-buff markings and paler ground-colour of the back and interscapulium; in the absence on the upper large and small wing-coverts of the vinaceous patches, which are replaced by irregular more or less obsolete rusty markings; by the narrower central black stripes on the upper wing-coverts; by the darker breast; by the brighter blue-grey of the edge of the wing and outer coverts; and by the buff, not whitish or whitish-buff, under tail-coverts" (*Rothschild*).

Colours of soft parts. Iris creamy-yellow (*Forrest*).

Measurements as in *tigrina*.

Distribution. Yunnan between 5,000 and 8,000 feet. Rothschild includes a bird from Katha, Ruby Mines District, in this race and presumably the Kachin birds are nearer this form than *S. c. tigrina* but the differences are very slight.

Nidification. Harington found this race breeding freely at Myingyan and in the hills North-East of Bhamo, *i. e.* just a little West of the Tengueh Hills but in continuous ranges with them. Two eggs obtained by him measure 28·0×21·5 and 28·2×21·4 mm.

Habits. Those of the species. Forrest obtained this bird between 7,000 and 8,000 feet both in bamboo-jungle and in forests.

(1876) Streptopelia chinensis ceylonensis.

THE CEYLON SPOTTED DOVE.

Turtur ceylonensis Reichenbach, Vol. Nat. Taulen, fig. 3373 (1851) (Ceylon).
Turtur suratensis. Blanf. & Oates, iv, p. 43.

Vernacular names. *Moni-praa* (Tam., Ceylon); *Kobeya*, *Alli-kobeya* (Cing.).

Description. Differs from the Indian Spotted Dove in its much smaller size.

Colours of soft parts as in the Indian Spotted Dove.

Measurements. Wing 123 to 129 mm.

Nidification. Phillips has taken a fine series of this little Dove's eggs, principally in the months December and March, but also in July, August and September. The nests, of twigs and rootlets, are placed in bushes and small trees between six and twelve feet from the ground. Sometimes they are placed in rubber-trees in plantations, sometimes in scrub-jungle or thin forest and sometimes on bushes in gardens and cultivated land about villages. Thirty eggs average 25·7×20·0 mm.: maxima 29·2×19·8 and 26·3×21·0 mm.; minima 23·7×19·8 and 25·2×19·0 mm.

Habits. Those of the species.

Streptopelia senegalensis.

Columba senegalensis Linn., Syst. Nat., 12th ed., i, p. 283 (1766).

Type-locality: Senegal.

The African form differs from both the races found in India in being much more reddish on the back with the rump bluish lead-colour, different to the back.

Key to Subspecies.

A. Darker and smaller: ♂ wing 125 to 132 mm.; ♀ 121 to 129 mm. ..... *S. s. cambaiensis*, p. 246.
B. Paler and larger: ♂ wing 135 to 145 mm.; ♀ 130 to 140 mm. ..... *S. s. ermanni*, p. 247.

(1877) Streptopelia senegalensis cambaiensis.

THE INDIAN LITTLE BROWN DOVE.

Columba cambaiensis Gmelin, Syst. Nat., i, p. 779 (1789) (Cambaya).
Turtur cambayensis. Blanf. & Oates, iv, p. 45 (part.).

Vernacular names. *Chota Fakhta, Perki, Tortra Fakhta, Panduk* (Hind.); *Chitti-bella guwa, Sowata guwa* (Tel.); *Touta pora* (Tam.).

Description. Whole head and neck a beautiful lilac-pink, darker on the crown and forehead, paler on the chin and throat; a patch of black feathers on either side of the neck, meeting in a narrow gorget below the throat, each feather bifurcate and broadly tipped bright rufous; back, scapulars and adjoining lesser and median coverts, innermost secondaries, rump, upper tail-coverts and central rectrices pale earthy-brown, sometimes tinged rufous; two pairs of tail-feathers next the central ones greyish-brown with small white tips, the remaining feathers black at the base, white on the terminal halves, the white extending down the outer edge of the outermost pairs; remaining wing-coverts grey-brown, the greater edged paler; edge of wing and winglet blackish-brown, three or four of the outer narrowly edged pale grey; secondaries dark slaty-brown, the first few edged paler; breast chestnut, shading to vinous-pink and thence into white on the abdomen and under tail-coverts; axillaries, under wing-coverts and flanks grey.

Colours of soft parts. Iris, outer ring dark brown, inner ring white; bill dark horny-brown to blackish; legs and feet lake-pink, pale scarlet or deep flesh-colour; claws black.

Measurements. Total length about 250 to 260 mm.; wing 120 to 132 mm.; tarsus about 20 to 21 mm.; culmen 12 to 13 mm.

Young birds have no black gorget, the plumage generally is duller and browner and the feathers of the upper parts and wing-coverts are edged with rufous; the breast is duller and less pink.

Nestlings in down are dull yellowish-fawn.

Distribution. All India West of a line drawn from Calcutta, West of the Rivers Hugli, Ganges and Kosi. In Sind, Baluchistan and the North-West Frontier it meets *S. s. ermanni* and, though here many birds are indeterminate, the majority are large and pale and should be placed under that race. Bourdillon found it on the Malabar coast in the extreme South and it has occurred in the Andamans but not in Ceylon.

Nidification. In the Plains the little Brown Dove breeds throughout the year, most eggs being laid in February to April or September to November; whilst in the hills it breeds continuously from April to October. It has normally two or three broods each year and many birds have five or six. The nest is placed on any tree, bush, bramble, cane-brake, bamboo-clump or cactus-hedge. Often it is placed in the verandahs of houses or on walls and under eaves, whilst twice it has been found on the

bare ground. The site selected is anywhere except in forest but the birds prefer the vicinity of villages and human habitations. The eggs are long and elliptical and sixty average 25·3 × 19·3 mm.: maxima 27·2 × 20·0 and 26·7 × 20·9 mm.; minima 22·6 × 18·2 and 23·0 × 18·0 mm.

Habits. This pretty little Dove is a resident bird, only moving locally under pressure of food-conditions or vertically according to seasons. It is typically a bird of civilization, exceedingly common all round villages and towns and one of the tamest and most confidential of our Indian birds. It has a very sweet, rippling little "coo" but is a quarrelsome bad-tempered bird, even with its own kind. It feeds principally on the ground, on seeds, grain, fruit and buds and it runs with rapidity and ease.

(1878) Streptopelia senegalensis ermanni.

THE PERSIAN LITTLE BROWN DOVE.

Turtur ermanni Bonaparte, Comp. Rend., p. 942 (1856) (Bochara).
Turtur cambayensis. Blanf. & Oates, iv, p. 45 (part.).

Vernacular names. *Tutan Gheri* (Sind.); *Tortra Fakhta, Chota Fakhta* (Hind.).

Description. Similar to the previous race but decidedly paler and generally bigger, though along the Indian Frontier and Sind the birds, though pale like the Northern form, are intermediate in size.

Colours of soft parts as in *S. c. cambaiensis.*

Measurements. Persian birds: wing, ♂ 135 to 145 mm., ♀ 130 to 140 mm. Indian birds are sometimes much smaller; Ticehurst refers to one from Sind and one from Kandahar, females, with wings of 126 and 125 mm. respectively.

Distribution. Turkestan, Persia, Mesopotamia, Baluchistan, Afghanistan and Sind. Frontier birds seem all to be of this race but not birds from Punjab, West of the Indus.

Nidification. Similar to that of the last bird but Bell says that it often makes its nest at the foot of a tree on the ground. In Sind it breeds, according to Ticehurst, from March to June and again after the rains break from July onwards. In Quetta it breeds from March to May. Twelve eggs average 25·4 × 21·2 mm.: maxima 27·0 × 21·1 and 26·3 × 21·2 mm.; minima 24·0 × 19·4 and 25·0 × 19·3 mm.

Habits. Those of the species. Ticehurst records that in March, when at sea ten miles from Karachi, four or five of these Doves came on board the vessel he was in, quite exhausted and, he thinks, evidently migrating.

Streptopelia decaocto.

Key to Subspecies.

A. Bare orbital skin white to pale slaty-grey ..... *S. d. decaocto*, p. 248.
B. Bare orbital skin bright yellow ..... *S. d. xanthocycla*, p. 249.

(1879) Streptopelia decaocto decaocto.

THE INDIAN RING-DOVE.

Columba risoria decaocto Frivalszky, A. M. Tarsasag Evk., p. 183 (1838) (Turkei).
Turtur risorius. Blanf. & Oates, iv, p. 46 (part.).

Vernacular names. *Dhor fakhta*, *Perki*, *Panduk*, *Gugi* (Hind.); *Daolo*, *Doula* (Hind., Bihar); *Kalthak*, *Kakalaki Pankghugi'u* (Beng.); *Pitha hola* (Mahr.); *Pedda-bella-guwa* (Tel.); *Cally-Praa* (Tamil, Ceylon); *Dgota gophu* (Cachari); *Jungli Kapoth* (Beluchi); *Paktah* (Turki); *Set-kepu* (Assam); *Ghero* (Sind).

Description. Whole head and neck lilac-grey; the throat paler and the chin sometimes albescent; in some birds the forehead and sides of the head are paler than the crown; a narrow collar of white, succeeded by a broader band of black, the latter more or less tipped white, forming a third band of white; wing-coverts and upper parts vary from pale earthy- to fawn-brown; central tail-feathers brown, more or less suffused with ashy-grey; succeeding pair of feathers more grey and with narrow white tips, outermost pair of feathers black at the base, white on the terminal portions, intermediate feathers grading from one to the other; primaries dark brown, edged pale whitish-brown; secondaries more grey, finely edged with whitish; outer wing-coverts pale grey, gradually changing into the colour of the back; breast lilac like the head, gradually changing to pale dove-grey on the abdomen and again to darker French-grey on the under tail-coverts; flanks, axillaries and under wing-coverts silver-grey; under aspect of primaries light brown and of secondaries greyish-white.

Colours of soft parts. Iris lake-red, red or crimson; bill almost black; edge of eyelid red; narrow orbital skin round eye white, pale livid or pale slaty-grey, never yellow; legs dark pinkish-red, crimson-red or dull purple; claws black.

Measurements. Total length 320 to 340 mm.; wing 158 to 169 mm.; tail 117 to 140 mm.; tarsus about 23 to 26 mm.; culmen about 16 to 18 mm.

Young birds are browner and duller, the wing-coverts edged with pale sandy-brown and the breast narrowly barred.

Nestlings in down are pale yellowish-white.

Distribution. Throughout India and Ceylon except in the wettest areas such as the Malabar coast and North-Eastern Himalayas. Outside India it occurs throughout Eastern Europe to Turkey and Serbia; Western Asia everywhere to India and thence through China to Japan.

Nidification. The Indian Ring-Dove breeds throughout the year in the plains and lower hills but in Eastern Bengal few birds lay during the heaviest rains in July, August and September. In the hills they lay from April to September. The nest is of the usual rough description but rather better made and a little more

cup-shaped than that of some Doves. It may be placed low down in any kind of bush or tree, either in open country, scrub-jungle, round villages or in gardens but never in buildings, though in Turkestan, Scully says it builds on the tops of walls. Sixty eggs average 30·1 × 23·2 mm.: maxima 32·2 × 23·9 and 32·1 × 25·0 mm.; minima 27·8 × 21·8 mm. This Dove breeds up to 8,000 feet in the Himalayas.

Habits. The Indian Ring-Dove is a resident bird, frequenting open country, tolerant of great heat and sandy deserts but less tolerant of heavy forest and excessive rainfall. Like the Brown Dove and Spotted Dove, it haunts the vicinity of humanity and is most common in cultivated country round villages and towns, freely entering gardens. It is a resident bird with but few even local movements and is very sociable, several pairs often feeding in company. They feed almost entirely on the ground on seeds, grain and berries but also on trees when these have fruit ripe. Their note is trisyllabic "coo" sounding like "koo koo-koo," constantly repeated.

(1880) Streptopelia decaocto xanthocycla.

THE BURMESE RING-DOVE.

Turtur decaocto xanthocycla Newman, Av. Mag., iv, p. 324 (1906) (Burma).
Turtur risorius. Blanf. & Oates, iv. p. 46 (part.).

Vernacular names. *Gyo-lin-pya* (Burm.).

Description. Similar to the preceding form but easily distinguished by the broad yellow bare rings round the eye. On the whole, also the coloration is deeper and brighter than in the Indian bird and the collar is more developed.

Colours of soft parts as in the preceding bird, except the orbital skin, which is yellow.

Measurements as in the typical form.

Distribution. All Burma, extending thence into South and Central China and the Indo-Chinese countries. The demarcation between the two races has still to be worked out in the Far East.

Nidification. Similar to that of the Indian bird. Ten eggs average 29·6 × 24·2 mm.: maxima 32·1 × 25·6 mm.; minima 27·0 × 22·0 mm. Eggs were taken by Hopwood in Upper Burma in January and February and again in August.

Habits. Those of the species.

Genus ŒNOPOPELIA.

Œnopopelia Blanf., Avifauna B.I., iv, p. 47 (1898).

Type, *Columba tranquebarica* Herm.

This genus is distinguished by its long wing, with the first

primary almost equal to the second. Bill and feet are the same as in *Streptopelia* but the sexes are not alike,

The genus contains but one species of three races It is found throughout India and the Indo-Chinese countries to China.

Key to Subspecies.

A. Paler, more especially on the lower parts ..... *Œ. t. tranquebarica*, p. 250.
B. Darker and more red, especially on the lower parts ..... *Œ. t. humilis*, p. 251.
C. Intermediate between the two first races ..... *Œ. t. murmensis*, p. 252.

(1881) Œnopopelia tranquebarica tranquebarica.

THE INDIAN RED TURTLE-DOVE.

Columba tranquebarica Herm., Obs. Zool., p. 200 (1804) (Tranquebarica).
Œnopopelia tranquebarica. Blanf. & Oates, iv, p. 47 (part.).

Vernacular names. *Seroti fakhta, Girwi fakhta, Biki* (Hind.); *Golabi ghugu, Ithuiya ghugu, Tuma khuri* (Beng.); *Itoo-ah* (Bihari); *Rah guwa* (Tel.); *Powarie* (Marie Gond.).

Description.—Adult male. Upper part of head and neck dark ashy-grey, the sides of the head and sometimes the forehead and lores paler; a black collar across the back and sides of the neck; the lowest feathers rarely narrowly edged with grey; back, scapulars, wing-coverts and innermost secondaries on visible portions vinous-red, tinged everywhere with brick-red except occasionally on the scapulars and back; lower back, rump and upper tail-coverts dark slaty-grey; central tail-feathers light greyish-brown, the amount of grey varying considerably; succeeding two pairs dark grey at the base, pale grey on the terminal third, remaining feathers slaty-black on the basal two-thirds, white on the terminal third and on the outer web of the outermost pair; primary coverts and edge of wing greyish-black; quills blackish-brown, narrowly edged with whitish; chin and centre of the throat albescent; remainder of lower plumage to the vent vinous-red; vent and thighs white tinged with vinous and under tail-coverts almost pure white; axillaries, under wing-coverts and flanks pale grey, the latter sometimes pure white.

Colours of soft parts. Iris hazel-brown to dark brown; edge of eyelid plumbeous; bill black, tinged with plumbeous at base and on cere; legs dull red, purplish-red or brownish-lake; claws black.

Measurements. Total length about 225 to 235 mm.; wing 130 to 140 mm.; tarsus about 17 to 18 mm.; culmen 13 to 14 mm.

Female. Head and mantle pale earthy-brown, greyish and paler on the head; lower throat and breast still paler earthy-brown with a faint vinous tinge; wing-coverts and inner secondaries like the back; the black collar is more definitely marked with grey.

Measurements. Wing 122 to 133 mm.

Young resemble the female but the feathers of the upper parts, wing-coverts and breast are narrowly edged with pale fulvous.

Nestling in down yellowish-white.

Distribution. All India, East to Bengal and Bihar and to Western Nepal. West it is common in Sind, Rajputana and the Punjab but not in North-West Frontier Provinces. It has once been recorded from Ceylon by Layard.

Nidification. Like our other Indian Doves this bird's nest may be found in any month of the year but April, May and June form the three favourite breeding-months. They are not such frequenters of man's neighbourhood as are the Spotted and Brown Doves and though a few nests may be found in gardens and round villages, most are built in large trees, in well-wooded country, away from villages—some even in thin forest. The nest is flimsy, even for a Dove's, and is generally placed low down in the outer branches but often well concealed. The eggs are normally two, but three is not very rare; most are pure white but a few have a faint ivory tinge. Forty-nine eggs average 25·9×19·9 mm.: maxima **29·0**×20·0 and 24·3×**21·2** mm.; minima **23·9**×21·0 and 25·1×**18·6** mm.

Habits. Except that it is not quite so tame and confiding a bird, its habits are much like those of the Spotted Doves. It keeps to well-wooded country and is less common in the driest and most arid parts and never seems to wander very far from a good water-supply, where it can drink morning, noon and evening. It feeds almost entirely on the ground on seeds, grain and berries and I have shot them with their crops full of shoots of mustard. In the North-west it is extremely numerous and though the birds keep in pairs they sometimes haunt the newly-cut rice-fields in such vast swarms of males alone that Pitman says the ground "looks a rich magenta colour in patches from the number of male Red Turtle-Doves feeding there."

(1882) Œnopopelia tranquebarica humilis.

THE BURMESE RED TURTLE-DOVE.

Columba humilis Temm., Pl. Col., 259 (♂) (nec plate 258) (1824) (Bengal-Luzon).
Œnopopelia tranquebarica. Blanf. & Oates, iv, p. 47 (part.).

Vernacular names. *Gyo-ni-ba* (Burm.); *Daotu-kashiba-gajao* (Cachari); *Lali Pohu, Harua kopu* (Assam); *Nok-kao-fie* (Siam).

Description. Differs from the preceding bird in its much darker, more richly-coloured plumage; the vinous-red on the under plumage is much darker and the vent and thighs are grey; the axillaries, flanks and under wing-coverts are darker grey and the first never white.

Colours of soft parts as in the preceding bird.

Measurements. Wing 137 to 148 mm.

Female and young differ like the male in being darker and more richly coloured.

Distribution. Assam, South of the Brahmapootra, Burma, the Indo-Chinese countries to China; Andamans. Robinson and Kloss give Pakchan in Peninsular Siam as the most Southern point for this Dove.

Nidification. Similarly to that of the typical form. In Assam it breeds in May and June, though eggs may be taken in any month; in Burma it breeds all the year round also but generally March to May, whilst in the Andamans it lays from February to April. Forty eggs average 26·4×20·4 mm.: maxima **29·5**×20·8 and 27·4×**22·4** mm.; minima **24·4**×20·2 and 24·5×**18·8** mm.

Habits. Those of the species.

(1883) Œnopopelia tranquebarica murmensis.

THE SIKKIM RED TURTLE-DOVE.

Œnopopelia tranquebarica murmensis Hartert, Vög. Pal., ii, p. 1499 (1920) (Nepal).
Œnopopelia tranquebarica. Blanf. & Oates, iv, p. 47.

Vernacular names. None recorded.

Description. Exactly intermediate in colour between the two preceding races. Much darker and redder than the Indian Red Turtle-Dove but yet decidedly paler than the Burmese form. The colours of the axillaries and under wing-coverts would suffice to distinguish the three forms; white or very pale grey in the first; dark grey in the second and grey in the present form.

Colours of soft parts as in the other races.

Measurements as in the Burmese form.

Distribution. Eastern Nepal, Sikkim to Assam, North of the Brahmapootra.

Nidification. Apparently breeds from March to May but quite possibly over a much wider season also. It breeds along the lower hills and also in the plains of Assam. The few eggs I have seen vary in size between 25·7×20·5 and 28·9×21·8 mm.

Habits. Those of the species. This is a rare bird in Assam but less so in the extreme West, where it was always to be met with in small numbers in the rice-fields after they had been reaped.

Genus MACROPYGIA.

Macropygia Swainson, Class. B., ii, p. 348 (1837).

Type, *Columba phasianella* Temm.

This is a very well-marked genus, the long tail exceeding the wing in length and being greatly graduated; the tarsus is feathered for the greater part of its length, the toes long with broad arboreal soles; the feathers of the rump are spinous and the tail-coverts elongated. A remarkable feature in this genus is the curious barring on the plumage of the adult male or female. In one species, *unchall*, the lower plumage is barred in the adult female but not in the male; in *rufipennis* the barring on the adult sexes is reversed, whilst in *ruficeps* neither sex is barred when adult.

The genus contains a great number of species and subspecies which extend from Eastern India and the Indo-Chinese countries into South Australia.

Key to Species.

A. Central tail-feathers banded throughout with black and rufous ..... *M. unchall*, p. 253.
B. Central tail-feathers not banded.
a. Wing exceeding 175 mm. ..... *M. rufipennis*, p. 255.
b. Wing under 165 mm. ..... *M. ruficeps*, p. 256.

Macropygia unchall.

Columba unchall Wagler, Syst. Av., Columba, sp. 38 (1827).

Type-locality: Java.

Wagler's description of *unchall* is perfectly satisfactory and, as it antedates *leptogrammica* Temm. 1835, must be used. This form differs from our Indian bird in its much richer redder plumage and in the narrower black barring on the upper parts.

(1884) Macropygia unchall tusalia.

THE BAR-TAILED CUCKOO-DOVE.

Coccyzura tusalia Hodgs., J. A. S. B., xiv, p. 809 (1843) (Nepal).
Macropygia tusalia. Blanf. & Oates, iv, p. 49.

Vernacular names. *Tusal* (Nepalese); *Ka-er* (Lepcha); *Daotu-kunt laima* (Cachari).

Description.—Adult male. Forehead, lores, cheeks, chin and throat buff, faintly tinged with lilac; crown, hind-neck and sides of neck behind the ear-coverts metallic lilac-purple, this colour not contrasting with but changing gradually from the buff of the face; rest of upper plumage barred black and rufous, the black being less broad on the upper back, more so on the upper tail-coverts, overlaid on the former with a green, purple or copper

sheen; tail dark brownish-black, narrowly barred with rufous, these bars being obsolete or absent on the outer feathers, which are dark grey with a broad band of black about one-third of their length from the tip, the intermediate feathers grade into the central ones; wing-coverts and inner secondaries like the back; primaries and outer secondaries dull deep-brown; upper breast lilac like the shoulders but with the black bars absent or nearly so, and with the metallic sheen very distinct; lower breast with no sheen, changing gradually into buff on the lower abdomen, vent and under tail-coverts.

Colours of soft parts. Iris, outer ring pink, inner ring pale blue; bill deep blackish lead-colour; eyelids fleshy-purple and narrow naked orbital skin grey; tarsus dull purplish-red or pinkish-brown, claws horny-black.

Measurements. Total length about 400 to 420 mm.; wing 177 to 203 mm.; tail 200 to 210 mm.; tarsus about 16 to 18 mm.; culmen 13 to 14·5 mm.

Female. Upper plumage much duller, especially the head; the head and breast are barred throughout more or less with dark brown.

Measurements. Wing 173 to 196 mm.

Young birds are like the female but with no gloss at all.

Distribution. Himalayas, Simla States and Garhwal, Kashmir to Eastern and Southern Assam; Hills of Burma South to Muleyit; Shan States, Karenni and a straggler in Siam. Birds from the Himalayas average larger than Southern birds and have on the whole wider black barring but the overlapping is so great that it is impossible to divide these into two more races.

Nidification. I found this bird breeding in great numbers in the Southern and Eastern Hill ranges of Assam between 4,000 and 6,600 feet from May to August, whilst Osmaston took a number of nests about Darjeeling in June and July. All ours were on small trees between six and twenty feet from the ground but Robinson found a nest in a bamboo-clump. The nests are well made for Doves' nests and occasionally have a scanty lining of moss or grass. One or two eggs are laid which are tinted buff to a rather warm café-au-lait, which soon fades. Two hundred eggs average 35·3 × 25·4 mm.: maxima **38·1** × 26·2 and 37·1 × **27·6** mm.; minima **30·4** × 25·3 and 34·2 × **19·8** mm. Both sexes take part in incubation and the birds probably pair for life. The male has a pretty display; perching high on a bare branch, he suddenly soars into the air, loudly clapping his wings above his back, then from thirty or forty feet he sails down with wings outspread and all his plumage puffed out, the long spiny feathers of the rump standing up like a puff-ball.

Habits. This is a forest-bird, keeping much to dense forest but resorting in immense numbers to open cultivation clearings to feed on rice, grain or mustard shoots. In the cold weather also

it sometimes resorts to more open and cultivated country for the same purpose but, however numerous they may be, they remain in pairs only. Their call is a very deep "croo-um," the second syllable being a booming note audible from a great distance. It is a noisy bird in the breeding-season, very silent at other times. It is a most tame and confiding bird and very leisurely in its movements, whether feeding on the ground or on fruit, acorns and berries on trees.

(1885) Macropygia rufipennis.

THE ANDAMAN CUCKOO-DOVE.

Macropygia rufipennis Blyth, J. A. S. B., xv, p. 371 (1846) (Java); Blanf. & Oates, iv, p. 50.

Vernacular names. None recorded.

Description.—Adult male. Whole head and hind-neck chestnut, glossed with lilac-purple on the crown; chin and throat very pale rufous-white; upper back dark brown, stippled with pale rufous, forming bars in younger birds; remainder of upper plumage dark brown, becoming more chestnut on the upper tail-coverts; central tail-feathers chestnut-brown, the outermost bright chestnut with an oblique subterminal dusky band; lesser wing-coverts and scapulars brown, edged chestnut; median wing-coverts the same with broader edges; greater coverts and quills dark brown, the primaries cinnamon and the innermost secondaries rufescent-brown on the inner webs; whole lower plumage light rufous-brown, darkest on the breast and palest on the abdomen, barred with narrow wavy lines of black; under tail-coverts, axillaries and under wing-coverts ferruginous-red; under aspect of tail ferruginous with grey central patches on the outer feathers.

Colours of soft parts. Iris violet or light blue with an inner ring of carmine; bill dull horny or purplish-red, paler at the gape; legs and feet dull pinkish-red in front, bright pale pink behind, soles still paler.

Measurements. Wing 180 to 193 mm.; tail 210 to 233 mm.; tarsus about 23 to 25 mm.; culmen 12 to 13 mm. Weight 8 to 10 oz.

Female. The stipplings on the back more pronounced and bar-like in character; generally there is a certain amount of black mottling on the head; lower plumage more chestnut than in the male, the sides of the neck slightly streaked with brown and the remainder of the lower plumage immaculate.

Young birds have the feathers of the head and neck edged with black, the barring on the upper parts more developed; the wing-quills are edged and tipped with rufous and the whole tone of the plumage more rufous than in the adult.

Distribution. Andamans and Nicobars.

Nidification. Davison says that it breeds in May, building among the mangroves in Trinkut and he found one nest which, though he was doubtful at the time, was evidently that of this bird. An egg in my collection obtained in the Nicobars in 1901 is like that of *Macropygia u. tusalia* but only measures 34·0 × 23·0 mm.

Habits. This bird is very common in the Andamans, frequenting gardens, clearings and secondary growth but retiring to deep forest during the heat of the day. It is said to feed almost entirely on chillies but Butler also found hard black seed, small berries and large green fruit in their stomachs.

Macropygia ruficeps.

Columba ruficeps Temm., Pl. Col., pl. 561 (1835).

Type-locality: Java.

The Tenasserim bird is very close to the typical Javan form, with which it agrees in size but differs in having rather less metallic gloss on the hind-neck and in having the breast mottled with dark brown in fully-grown adults. This last character is proved to be of some importance by the series of this Dove in the collection of the Federated Malay States Museum.

(1886) Macropygia ruficeps assimilis.

THE BURMESE LITTLE CUCKOO-DOVE.

Macropygia assimilis Hume, Str. Feath., ii, p. 441 (1874) (Tenasserim).
Macropygia ruficeps. Blanf. & Oates, iv, p. 51.

Vernacular names. None recorded.

Description. Upper part of head, lores, cheeks, ear-coverts and anterior of sides of neck cinnamon-rufous, darkening and changing into purple-brown on the lower neck and back; the purple being most pronounced on the sides; shoulders and sides of lower neck more or less glossed with lilac and with faint indications of dark bars and sometimes with a few pale rufous bars; back, rump and upper tail-coverts brown, the latter tinged rusty; scapulars rather darker brown than the back; coverts dark brown, the coverts edged rufous, obsolete on the greater coverts in the oldest birds; primaries and outer secondaries narrowly and the inner secondaries broadly edged with rufous, the latter also with rufous bases to the inner webs; central tail-feathers dark red-brown with obsolete dark bars; outermost pair chestnut, a broad black or dark brown band across the terminal third and tipped broadly

paler rufous; intermediate grading from one to another; chin and throat whitish, remainder of plumage paler cinnamon-rufous, darkest on the breast, flanks and under tail-coverts, palest on the abdomen, the breast mottled at the sides with blackish and the feathers also tipped whitish.

Colours of soft parts. Iris white, pearl-white or grey, sometimes pinkish-white and sometimes with an inner ring of blue; orbital skin and eyelids pale blue; bill pale horny-brown, pinkish at the base; legs and feet brownish-pink to dark purplish-brown.

Measurements. Wing 140 to 151 mm.; tail 165 to 178 mm., tarsus about 19 mm.; culmen 12 to 13 mm.

Female. Duller and darker above, the rufous of the head divided from the back and without purple tint or lilac sheen; below darker and duller with more mottling; the upper back and neck minutely freckled with pale brown.

Young birds are like the female but have the whole upper parts barred with black and rufous; the upper tail-coverts broadly edged with rufous and the mottlings on the breast more extensive.

Distribution. Burma from Karennee and Shandoung in Pegu, South to Muleyit; South Shan States and once Siam.

Nidification. Robinson obtained the nest, a solid pad of moss, in a clump of bamboo, about 12 feet from the ground at Shandoung on the 19th April. The one egg it contained measured 1·26 × ·84 in. An egg taken by Hopwood at Nwalabo in Tenasserim on the 14th May is exactly similar, a perfect ellipse, pale buff in colour, measuring 29·1 × 21·0 mm.

Habits. In Burma this Cuckoo-Dove is a hill-form, seldom found below 2,000 feet and occurs at least up to 6,000 feet but Robinson informs me that the subspecies in Malay comes right down to the plains to Hot Springs, so long as these are close to heavy forest. Davison syllabifies its call as "Oo-who-who-oo," rapidly repeated. They go about in small parties, living on fruit, seeds, chillies, buds etc.

Subfamily GEOPELIINÆ.

Salvadori keeps three genera in this Subfamily but of these two are atypical, having only twelve tail-feathers, so that really it should contain but the one genus *Geopelia*, our Malayan bird with its fourteen tail-feathers. The birds of this Subfamily have no ambiens muscle or cæca but have a small naked oil-gland; the bill is small; the tail about as long as the wing and well graduated as in *Macropygia* but in general appearance *Geopelia* is very close to *Streptopelia*. The tarsi are long and devoid of feathering, the toes slender and well adapted for running about on the ground.

Genus GEOPELIA.

Geopelia Swainson, Class. B., ii. p. 348 (1837).

Type, *Columba striata* Linn.

Characters those of the Subfamily. The sexes are alike.

(1887) Geopelia striata striata.

THE BARRED GROUND-DOVE

Columba striata Linn., Syst. Nat., 12th ed. i, p. 282 (1766) (East Indies, restricted to Jáva) *.

Geopelia striata. Blanf. & Oates, iv, p. 52.

Vernacular names. *Merbok, Ketitir* (Malay); *Nok-ta'ao-cha-wah* (Siam).

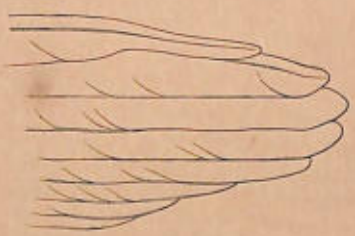


Fig. 33.—Primaries of *G. s. striata.* ½.

Description. Forehead and crown, to centre of eye, ashy-grey; cheeks, chin and throat paler ashy-grey; posterior crown and nape light rusty-brown; back and sides of neck, throat and sides of breast barred blackish-brown and white, the upper neck tinged with fulvous; whole upper plumage and wing-coverts earthy-brown, each feather edged with a black bar and the coverts tinged silvery; quills darker brown, the innermost secondaries like the back, with the basal halves of the inner webs chestnut; middle tail-feathers dark brown obsoletely barred darker, the adjoining pair blackish-brown; remaining five pairs black on the basal, white on the terminal halves, the white also extending some way down the edge of the outermost pair; breast a beautiful vinous-pink, gradually changing to a pale fulvous-white on the abdomen and to pure white on the under tail-coverts; flanks barred brown or black and fulvous or fulvous-white.

Colours of soft parts. Iris white to bluish-white; orbital skin pale bluish-grey; bill pale dull plumbeous or bluish-grey; legs and feet dull pale purple, paler behind and on the soles.

* Edwards's bird on which Linnæus founded the name was a captive bird in London which was very probably obtained in Java.

Measurements. Total length about 210 to 220 mm.; wing 92 to 104 mm.; tail 101 to 117 mm.; tarsus about 17 to 18 mm.; culmen 11·5 to 12·5 mm.

Young birds are like the adult but the barring on the flanks is continued across the breast and abdomen and the breast is white or dull rufous-white with no pink tinge or sometimes sandy-buff irregularly cross-barred.

Distribution. The South of Tenasserim, through the Malay Peninsula to Java.

Nidification. Kellow found this little Dove breeding near Perak in January, whilst Herbert took eggs in Siam during June near Bangkok and Sapatoom but these may have been escaped birds' eggs. The nest is described as a tiny fragile affair of twigs, placed on low bushes. The eggs are one or two in number, pure white or nearly so, twelve eggs averaging 22·1×16·6 mm.: maxima **24·2×17·4** and 22·4×**18·0** mm.; minima **19·3**×14·8 and 20·6×**14·0** mm.

Habits. These are said to be very similar to those of the Spotted Dove. It keeps to open country or scrub-jungle and is never found in forest. Round about villages near the coast it is very common in cultivated fields and grass-lands, running about the ground, generally in pairs, hunting for seeds, small berries and fruits. Its note is said by Davison to be a soft "kok-akurr-kurr," repeated several times.

Order PTEROCLETES.

The Order *Pterocletes* contains but one Family—the *Pteroclidæ*,—so the distinguishing characters are the same for both the Order and the Family and are dealt with fully under the latter.

Family PTEROCLIDÆ.

The Sand-Grouse constitute an Order closely allied to the Pigeons or *Columbæ* on one hand, the *Gallinæ* or true Game-Birds on the other.

In the Sand-Grouse the toes are fitted for walking, though the tarsi are short and not adapted for continuous exertion. The bill is Galline in character, though small and feeble, having no cere or soft skin over the tarsal half as in the Pigeons. The Sand-Grouse have eleven primaries and no fifth secondary as in the *Columbæ*, whereas the *Gallinæ* have only ten primaries but possess a fifth secondary. In all three orders the muscles of the thighs and legs are similar. The *flexor perforans digitorum* is attached to the *flexor longus hallucis* by a fibrous vinculum, the former supplying the three front toes, and the latter the hallux or hind toe. The ambiens muscle is present except in a few Pigeons. The femoro-caudal, except in the Peafowl and Turkeys, the accessory femoro-caudal, the semi-tendinosus and accessory semi-tendinosus are all present; both carotids are present also, except in the Megapodes.

The keel of the sternum is very high and there are usually two notches on each side of the posterior margin, the inner sometimes reduced to a foramen.

The gall-bladder is present, there is a nude oil-gland and the contour-feathers have after-shafts.

Palate schizognathous; nasals generally schizorhinal but very variable; basipterygoid processes present; cervical vertebræ fifteen or sixteen.

The dorsal feather-tract has an interscapulary fork, and the lateral bare tracks extend on the shoulders as far as the base of the neck.

The young of Sand-Grouse differ greatly from those of the Pigeons, being covered with richly-coloured down when hatched, whilst they are able to run at once and, to some extent, feed themselves.

The tarsus is well feathered in all the members of this family, in one genus, *Syrrhaptes*, even the toes being covered. They are birds of exceptionally powerful flight with comparatively long wings; the tail-feathers number fourteen or sixteen.

Blanford accepted three genera in this family but *Pterocles* and *Pteroclurus* * only differ in the shape of their tails, and this hardly seems a generic character in so small a group of birds. I admit only two genera, *Pterocles* and *Syrrhaptes*.

Key to Genera.

A. A hind-toe present; tarsus feathered in front only; toes naked	PTEROCLES, p. 261.
B. No hind-toe; tarsus feathered throughout and toes also feathered	SYRRHAPTES, p. 275.

Genus **PTEROCLES** *.

Pterocles Temm., Man. d'Orn., p. 299 (1815).

Type, *Tetrao alchata* Linn. (by sub. desig., Gray, List Gen. Birds, p. 62, 1840).

In this genus the bill is small and arched above; nostrils elongate, basal, and almost covered by frontal plumes; wings long and pointed; tail moderate, the central rectrices sometimes lengthened; tarsi feathered in front, reticulate behind; toes short and naked, hallux present.

The genus is represented throughout Africa, Southern Europe and South-West and Central Asia.

Key to Species.

A. Central tail-feathers greatly lengthened.	
a. Abdomen white throughout, in both sexes	*P. alchata*, p. 268.
b. Lower plumage marked with black.	
a'. Middle of abdomen barred black and rufous	*P. exustus*, ♀, p. 271.
b'. Middle of abdomen black.	
a^2. A black gorget across breast	*P. exustus*, ♂, p. 271.
b^2. No black gorget across breast	*P. senegallus*, p. 273.
B. Central tail-feathers not greatly lengthened.	
c. Abdomen all black	*P. orientalis*, p. 262.
d. Abdomen banded black and white.	
c'. Two dark pectoral bands.	
c^2. No band across hind-neck	*P. indicus*, ♂, p. 264.
d^2. A band across hind-neck	*P. lichtensteinii*, ♂, p. 265.
d'. No dark pectoral bands.	
e^2. Chin unspotted, tarsus spotted or barred	*P. indicus*, ♀, p. 264.
f^2. Chin spotted, no spots or bars on tarsus	*P. lichtensteinii*, ♀, p. 265.
e. Abdomen unspotted buff, ♂; spotted buff, ♀	*P. coronatus*, p. 267.

* Sclater, Bull. B. O. U., p. 73, 1922, has shown that *Pteroclurus* is only a synonym of *Pterocles*, so that those who desire to recognize two genera must use the name he here proposes, *Eximialector*.

(1888) Pterocles orientalis.

THE LARGE, IMPERIAL, OR BLACK-BELLIED SAND-GROUSE.

Tetrao orientalis Linn., Syst. Nat., 10th ed., i, p. 161 (1758) (in Oriente) (Anatolia, *apud* Pall.).
Pterocles arenarius. Blanf. & Oates, iv, p. 54.

Vernacular names. *Bhat-titur, Bakht, Bakhy-titur* (Hind.); *Banchur, Kurmor* (Peshawar); *Burra Bhatta* (Hariana); *Siya-sinah* (Persian); *Katinga* (Sind); *Katarr* (Arabic); *Chur* (Sind).

Description.—Adult male. Head above, neck and upper back grey tinged with russet, purer grey round the eye; back, rump and upper tail-coverts grey, the latter blackish, each feather pale buff at the base and with a large drop of deeper buff at the end; tail-coverts edged with yellow; inner wing-coverts and scapulars like the back but with the spots larger and yellow-ochre in colour; secondary and median coverts yellow-ochre; bastard-wing grey; outer web of first primary brownish-black; remaining primaries and secondaries white on the basal half and greyish-brown on the terminal, with a few curious streaks of brown on either web; central tail-feathers barred grey and buff, tipped with grey-green edged with a narrow line of buff; remaining tail-feathers the same but with a broad terminal line of white and each feather deepening in colour until the outermost are dark grey, merely stippled with rufous at the base; chin, upper throat, sides of head and neck chestnut, extending as a collar round the neck, except in the centre, where it pales first into orange and then into the grey of the neck; a triangular patch of black on the lower throat, sometimes extending up the sides of the neck; breast grey, followed by a black band extending up the sides of the shoulders; a broad belt of vinous or pinkish-grey follows the black; abdomen, flanks, upper thighs and vent chocolate-brown or blackish, the rusty bases to the feathers sometimes showing through; lower tail-coverts, lower thighs and feathering of tarsus white.

Colours of soft parts. Iris brown, edge of eyelids lemon-colour; bill pale to darkish plumbeous, tip blacker; legs and feet grey, tinged brown, earthy, or plumbeous, claws darker.

Measurements. Total length about 350 to 400 mm.; wing 226 to 248 mm.; tail 101 to 128 mm.; tarsus about 24 to 28 mm.; culmen 10 to 13·5 mm. "Weight 1 lb. to 1lb 4 oz." (*Hume*); "1 lb. 7 oz., very fat male" (*Ellerby*).

Female. Whole upper plumage pinkish-grey, the head, nape and upper back with black streaks, the remainder more rufous and barred; central tail-feathers like the back, each succeeding pair darker and with broad terminal bars of white; scapulars and inner wing-coverts like the back; quills like those of the male but browner and with the tips and edges of inner webs of the primaries white; primary coverts grey; secondary coverts dark grey, median coverts yellow-ochre on the visible portions; chin, throat and sides of head yellowish-grey, the sides of the head, lores and ear-coverts finely streaked with black; lower throat with reversed,

half-moon-shaped band of black followed by a pearl grey band fading into pinkish-grey on the breast; remainder of lower parts as in the male.

Measurements. Wing 203 to 234 mm.

Young male shot in October has the whole upper plumage, chin, throat, breast and upper abdomen a pale isabelline, barred and vermiculated with blackish-brown; abdomen black and under tail-coverts white with black bases; tail-feathers barred black and rufous-buff, black and white on the outermost; wing-quills and primary coverts grey, tipped with rufous.

Distribution. From the Canaries in the West through Northern Africa and the countries of Europe bordering on the Mediterranean; through Asia Minor and Palestine to Persia, Baluchistan, Afghanistan and North-West India. In India it is very common in the Punjab, Bikanir, North-West Rajputana and the Rann of Cutch. It is also rarely to be found as far South as Khatiawar (*Fenton*) and Bhopal, whilst "Big Bore" records the shooting of three specimens in Mysore. In the East it has occurred in Nepal, Lucknow and Allahabad. In Sind it is not so common as I stated in my 'Game-birds,' though it occurs in most parts of that Province.

Nidification. Outside our limits the Large Sand-Grouse breeds wherever found. Whitaker gives the breeding-months as April to June, Barnes found it breeding in Afghanistan in May and, in the East generally, May and the end of April seem to be the months in which most eggs are laid. The eggs, three or rarely two only, are laid on the bare ground in a scrape made by the birds themselves, often quite unprotected, sometimes semi-shaded by a stone, clump of withered grass or other shelter. The ground-colour of the eggs varies from greyish stone-colour to a warm buff or greenish stone-colour; the superior or primary markings consist of indefinite smudges, blotches and spots of red-brown, grey-brown or rufous-brown with secondary markings of lavender-grey or neutral tint. As a rule, the eggs are dull and lifeless compared with those of some of the Sand-Grouse. Seventy-eight eggs average 47·5×32·3 mm.: maxima **53·2**×31·2 and 50·0×**36·6** mm.; minima **43·5**×30·8 and 47·6×**30·2** mm.

Habits. The Black-bellied Sand-Grouse are Winter visitors to India, where they are to be found frequenting wide, open, sandy plains or taking their mid-day rest in ploughed lands and, though they drink with the greatest regularity every morning and evening, they are often found at great distances from water. They collect in enormous numbers, often in hundreds and sometimes in thousands, these flocks consisting all of one sex on their first arrival in India but mixing up very shortly after. Their flight is extremely swift and as they fly they constantly utter their call, "Katarr, Katarr." They feed principally on grass and vetch-seeds but will eat berries, grain and the shoots and buds of various plants as well as most kinds of small insects. They are wild, shy birds and almost impossible to approach on foot but provide excellent sport as they flight to and from their drinking-places.

(1889) Pterocles indicus.

THE PAINTED SAND-GROUSE.

Tetrao indicus Gmelin, Syst. Nat., i, p. 575 (1789) (Coromandel Coast).

Pterocles fasciatus. Blanf. & Oates, p. 55.

Vernacular names. *Pahari Bhat-titur, Bhat-bay, Dongar kavri* (Hind., N.W.P.); *Chapka* (Saugur); *Gutila Titur* (Mirzapur); *Palki* (Belgaum); *Handeri* (S. India); *Kal-gowjal-haki* (Can., Mysore); *Sonda Polanka* (Tam.).

Description.—Adult male. Forehead white, followed by a black band and then another white one; crown reddish-buff spotted with black or deep chocolate-brown; hind-neck olive-yellow or olive-buff; back to tail chestnut-buff, barred with black, the bars V-shaped on the tail-feathers, which are tipped with yellow-buff; scapulars like the back but more boldly barred, some of the bars grey and the feathers broadly tipped with yellow-buff; wing-coverts buff, those next the scapulars marked like them; the innermost tinted like the nape, changing to ochreous-buff on the outer; winglet, primary coverts and primaries dark brown, the last with paler edges; inner secondaries like the scapulars, their coverts barred white and slate-colour with buff edges and the margins of the slate bars black; sides of head and chin to upper breast ochreous-buff, bordered by a broad chocolate band and then by a band of buffish-white; under tail-coverts banded buff and black, abdomen and remaining underparts banded chocolate-brown and white, the latter bars more or less obsolete next the broad white breast-band.

Colours of soft parts. Iris dark brown; orbital skin lemon-yellow to bluish- or greenish-yellow; bill reddish to reddish-brown or reddish-horny; legs and feet dingy yellow or orange to dingy brown or orange-brown.

Measurements. Wing 158 to 184 mm.; tail 80 to 101 mm.; tarsus about 22·5 to 24·5 mm.; culmen about 12·5 to 14·5 mm. Weight 6 to 8 oz.

Female. Crown as in the male but no white and black bars on the forehead; whole upper plumage reddish- or chestnut-buff barred with deep brown or black bars; tail rather paler; lores and sides of head fawn with small black streaks; chin and upper throat fawn-buff, remaining lower plumage barred buff and deep brown, the buff bars paling to white on the abdomen and the brown deepening to blackish.

Young males are like the female but more closely vermiculated or barred.

Chicks in down are uniform earthy-brown.

Distribution. Most of the Western Peninsula of India excluding the South-West coast from Bombay southwards. It is common in the Deccan, Central Provinces, Cutch, Rajputana, North-West



PTEROCLES INDICUS. (GMELIN).
♂ The Painted Sand-Grouse ♀

Province and the Punjab. It has occurred East as far as the Santhal Parganas, Ranchi, Hazaribagh and Gya. In the North-West Barton records it as occurring every year at Rustom, near Mardan—it has been shot near the Orakzai and Whitehead records one of a pair being shot at Shinauri, 3,800 feet, on the N.W. Frontier.

Nidification. Except on the extreme outskirts of its range the Painted Sand-Grouse is resident and breeds. Eggs have been taken in every month of the year except during the heavy rains of July, August and September. April to early June are however the favourite months. The eggs are laid on the ground in scratchings made by the birds in ravines, broken ground and stony hills where there is some bush- or scrub-jungle, whilst in the Central Province it often breeds in actual forest. The eggs, three in number, occasionally two and once four, are the most beautiful of all the Sand-Grouse eggs. The ground-colour varies from a pale cream to a warm salmon and they are sparingly spotted with light to dark purple-red with secondary blotches of lavender or reddish-grey. Eighty eggs average 35·8 × 25·0 mm.: maxima **40·0 × 27·0** mm.; minima **33·0 × 24·6** and 35·0 × **23·4** mm.

Habits. This is a resident bird, frequenting dry broken country, stony hillsides and rocky ravines but a certain amount of bush- or scrub-jungle is essential, whilst it also is sometimes found in cultivated country or patches of waste land. It collects in small flocks of four or five to a dozen, rarely in much larger flocks, though Pythian-Adams records 200 in one patch of jungle. It drinks later than other Sand-Grouse and seldom before the sun is well below the horizon. Its voice is a soft low note like the words "yek, yek, yek," rapidly repeated. The plumage is less dense than that of other Sand-Grouse and though they fly low and fast, they are easier to kill than most on this account. Their food is almost exclusively vegetarian—seeds, berries, grain and shoots of plants.

Pterocles lichtensteinii.

Pterocles lichtensteinii Temm., Pl. Col., pp. 355, 361 (1825).

Type-locality: Nubia.

The typical African form is a little darker than our Indian bird but the two races are very close.

(1890) Pterocles lichtensteinii arabicus.

THE ARABIAN CLOSE-BARRED SAND-GROUSE.

Pterocles lichtensteinii arabicus Neum., Orn. Monatsb., p. 152 (1909) (Lahadj, S. Arabia).
Pterocles lichtensteinii. Blanf. & Oates, iv, p. 57.

Vernacular names. None recorded.

Description.—Adult male. Forehead with three bands as in *indicus* but V-shaped instead of straight across; a broad short supercilium white with a black eyebrow over the eye; a fine black line from the black band under the eye and over the ear-coverts; chin and throat unspotted buff; rest of head isabelline-buff, streaked above, spotted below with black; remaining upper plumage and wing-coverts pale buff closely barred with wavy black lines, broader on the tail-feathers, scapulars and inner coverts; tail-feathers broadly tipped with rich buff; secondary and median wing-coverts pale clear buff barred black and tipped yellow; winglet, primary coverts and primaries brown, edged paler; upper breast barred buff and black; lower breast rich yellow-buff with a chocolate-chestnut to black band across the middle and a second lower band much broken and mixed with white; abdomen, vent and flanks white, each feather with a moon-shaped bar of black and a second terminal bar of chocolate; under tail-coverts pale buff with arrow-shaped marks of black or deep chocolate; feathers of tarsi white to pale buff; under wing-coverts and axillaries pale grey.

Colours of soft parts. Iris brown; orbital skin yellow; bill fleshy-brown to orange-brown; feet orange-yellow, claws dusky.

Measurements. Wing 166 to 186 mm.; tail 72 to 77 mm.; tarsus about 22 to 27 mm.; culmen 11·6 to 13·9 mm. Tail of 14 feathers.

Female. Has no black or white bars on the forehead and the whole lower surface is barred buff or buffy-white and black; the barring on both upper and lower plumage finer and clearer than in the male. The female averages a little smaller than the male.

Distribution. South Arabia, Mesopotamia, South Persia, Afghanistan, Baluchistan and Sind. In the latter Province it is found from Gul Mahomed, Mehar, Upper Sind to Karachi in the South.

Nidification. Nothing recorded but it probably is resident and breeds wherever it occurs. If so it would certainly breed within our limits in Sind, where Ticehurst records it as common in the hills and occurring casually over a great area.

Habits. This Sand-Grouse is said to very closely resemble the preceding bird in its habits, keeping much to thin bush- and scrub-jungle in ravines or on broken hillsides. Like that bird it drinks very late at night and Ticehurst records that in the Daruni Pass he found these birds coming to water at the tail of the pool in the pass. He says: "All the afterglow had gone before the first flock arrived, so that seeing them was a difficult matter." Their flight when undisturbed has been likened to that of a butterfly or nightjar but when frightened their speed is great. The note is said to be a low chirrup and their food to be almost entirely seeds.

Pterocles coronatus.

Pterocles coronatus Licht., Verz. Doubl., p. 65 (1823).

Type-locality : Nubia.

The African typical form has the general tone of the upper plumage much more *red*, yet much paler than the Indian and Eastern one, whilst the female of our bird has the under surface whiter and less buff with the bars closer and more numerous.

(1891) Pterocles coronatus atratus.

Pterocles coronatus atratus Hartert, Bull. B.O.C., xii, p. 48 (1902) (E. Persia).
Pterocles coronatus. Blanf. & Oates, iv, p. 57.

Vernacular names. *Katinga* (Sind).

Description. Centre of forehead white; on either side a patch of black, carried down the base of the bill and down the centre of the throat; crown dull vinous-grey or vinous-buff surrounded by pure French-grey; lores and next the black patch whitish; sides of head and ear-coverts deep ochre, produced as a collar round the hind-neck; rest of upper plumage isabelline, the feathers with pale centres and the scapulars with a bar of dark grey colour below and on the sides of the grey spots; lesser wing-coverts vinous-buff, gradually changing to rufous-buff on the median coverts with pale centres and grey oblique patches on the outer webs; primary coverts and winglet brown; primaries brown, the fifth edged pale buff on the tip of the inner web, the buff tip increasing on each inner primary and forming a broad buff band running obliquely across the inner primaries; plumage below buff, greyish on the upper breast and more ruddy-buff on the abdomen; vent chestnut-brown; thighs and tarsi buff, the latter often marked with chestnut-brown; tail isabelline, the central feathers faintly tipped paler, the others rufous-buff, broadly tipped with white and sub-tipped with dark brown; under greater wing-coverts brown; remaining coverts and axillaries white.

Colours of soft parts. Iris brown; bill slaty-blue; legs and feet dull pale fleshy-grey; "bill lavender-grey, feet white" (*Ticehurst*).

Measurements. Wing 178 to 193 mm.; tail about 120 to 132 mm.; tarsus about 25 mm.; culmen 12·5 to 13·5 mm.

Female. Has no black and white on the head; the grey and buff crown are replaced by the colour of the back, the ochre of the sides of the head is reduced in extent and depth of colour; the tail is marked like the back; the whole of the underparts are marked with crescentic black bars which become less defined on the abdomen and thighs and disappear on the under tail-coverts and tarsi.

Colours of soft parts as in the male.

Measurements. Wing 179 to 189 mm.

Distribution. Arabia (? Palestine), Mesopotamia, Persia, Afghanistan, Baluchistan and N.W. India. In the last it is found West of the Indus all along the North-West Provinces to the South of Sind. Swinhoe obtained three specimens from Mhow in Dhar.

Nidification. Barnes found this Sand-Grouse breeding at Chaman in Afghanistan, shooting a pair of birds off three eggs which he says measure 38·1 × 27 mm. Another egg taken by him and now in the British Museum measures 41·0 × 27·3 mm. and is a pale yellowish stone-colour with primary markings of vandyke-brown and secondary blotches of pale lavender distributed sparsely all over the egg. Two oviduct eggs in my collection from birds shot in Baluchistan measure 40·4 × 27·6 and 39·3 × 26·2 mm. One egg is pale grey very lightly blotched with brown and lavender-grey, the other is darker yellow-stone, more profusely marked and with a dense ring of brown spots at one end. There is no doubt that these birds breed wherever found but they haunt such inhospitable deserts that it may be long before eggs are actually taken on Indian soil. May and June are apparently the months during which they should be looked for.

Habits. The Coronetted Sand-Grouse is common in many parts of Sind, frequenting the most arid and stony deserts, more especially those which are broken up by ravines and rocky and stony hillsides. Vegetation is almost *nil*, yet they pick up enough food in the way of grass-seeds etc. to keep in plump condition and provide an excellent dish for one's table. They *can* fly with immense speed but often flutter about quite slowly with a vacillating flight and they are very tame, confiding birds easy to approach and easy to kill compared with most Sand-Grouse. They drink in the mornings between sunrise and 9 A.M., coming to the water in small flocks of half a dozen or twenty or so until great numbers collect. They alight some distance from the water and drink like chickens, many entering the water and soaking their breasts with it, possibly to take to their young.

Petrocles alchata.

Tetrao alchata Linn., Syst. Nat., 12th ed., i, p. 276 (1776).

Type-locality: Pyrenees.

(1892) Petrocles alchata caudacutus.

THE LARGE PIN-TAILED SAND-GROUSE.

Tetrao caudacutus Gmel., Reise de Russ., iii, p. 93 (1774) (N. Persia).
Pteroclurus alchata. Blanf. & Oates, iv, p. 59.

Vernacular names. None recorded.

Description.—Adult male. Centre of crown and nape grey, tinged with ochre; chin and throat black; remainder of head rich orange or rufous-buff shading into ochreous on the neck all round; a black line from the eye to the back of the ear-coverts; back and scapulars olive-ochre, a few feathers of the back and most of the scapulars with a yellow subterminal spot and all margined with grey; lower back and rump yellow-buff barred with black; upper tail-coverts more yellow and the bars on the longest arrow-shaped; tail barred blackish and buff at the base, becoming black and olive-ochre at the tip and the prolongations black; outer tail-feathers are tipped yellow and subtipped blackish; wing-coverts white with black edges and broad bands of chestnut-chocolate near the tips; winglet, primary coverts and primaries grey, the last darker on the inner webs and edged with white; outer web of first primary and all the shafts black; innermost secondaries like the scapulars; secondary coverts yellow ochre with deep chocolate terminal bands; breast pale pinkish-rufous, divided from the yellow of the neck and the white of the abdomen by narrow black bands; greater under wing-coverts grey; other under wing-coverts, axillaries and under tail-coverts white.

Colours of soft parts. Iris brown; bill dusky green to dull brown or slate-colour; feet dirty yellow to dusky green.

Measurements. Wing 213 to 224 mm.; tail 140 to 190 mm.; tarsus about 25 to 29 mm.; culmen 12·5 to 14·5 mm. Weight 10 to 12 oz.

Female. Upper parts from forehead to tail buff barred with black; interscapulars more rufous and tail-coverts more yellow; chin and throat white; rest of head like that of the male but pale and dull; wing-coverts white with black edges and rufous subterminal bars; below the rufous of the neck there is a broad black collar, then a narrow ochre band shading into grey and then another narrow band of black; remaining under plumage as in the male.

Measurements. Wing 194 to 231 mm. Weight $8\frac{1}{4}$ to $11\frac{1}{4}$ oz.

Young males are barred above as in the female and acquire the adult plumage in patches.

First plumage.—Male and female. Whole upper parts, head, breast and neck dull buff barred with black or dark brown above and dull brown below; chin and throat white; wing-quills paler and freckled with reddish towards the tips.

Eclipse plumage similar to that of the female but without the dark bars on the back.

Nestling. Above reddish-brown, profusely spotted all over with black and with apical specks of white; white, black-edged lines on crown and sides of head from bill to the centre of the back and horse-shoe shaped on the mantle, two small similar horse-shoes on wings.

Distribution. Persia, Baluchistan, Afghanistan West to the South Russian Steppes, Asia Minor, Arabia and Northern Africa;

South to the Sahara, Nubia and Abyssinia and India. In the latter country it occurs in enormous numbers in the North-West Trans-Indus country and again between the Indus and Chenab; it is still frequently met with as far as the Gara and the Beas through the Punjab to Ludhiana and Delhi in the East; South it has been obtained as far as Sambhur, Jodhpur, Bikanir and Deesa.

Nidification. Pitman found this fine Sand-Grouse breeding in enormous numbers in Mesopotamia. During June and July he refers to one of the camps of the troops advancing on Kut-el-Amara as "one huge breeding-ground," the birds not selecting the barest places like *P. senegallus* but making the scrapes for their eggs on places growing grass, thin vetch or the Polygonum, the seeds of which form their staple food. Vast multitudes breed in the same area, many nests being within a few yards of one another placed without regard to any special shelter. Many millions of pairs of birds must breed in the Tigris Valley, for day after day the troops were marching through breeding country in which the birds literally swarmed. They breed from early May to the middle of July but most eggs are laid during the last week of May and the first two weeks of June. Three eggs form the normal clutch but two only are often laid. They are the boldest and most richly marked of all Sand-Grouse eggs. In ground-colour they vary from a pale cream or yellowish-stone to a bright warm buff or salmon-pink. The primary markings consist of bold blotches and a few specks of vandyke-brown or deep red with light grey or neutral-tint secondary marks. These are numerous and generally all over the surface, in a few eggs being more numerous at the larger end. In shape they are nearly true ellipses. One hundred eggs average 45·0 × 30·4 mm.: maxima 49·9 × 29·9 and 40·1 × 33·3 mm.; minima 39·6 × 28·3 and 46·1 × 28·0 mm.

In India it certainly breeds in the Peshawar Valley and almost equally surely in the Quetta District. Bogle found it in pairs in the former district in June and a female shot by him contained an egg ready for expulsion.

When the young are hatched they are given drink by the male bird saturating his under plumage with water when drinking and then flying straight back to the nest, when the young suck the water from the soaked feathers.

Habits. For the most part at all events these Sand-Grouse are Winter visitors to India but they are resident over the greater part of their habitat, though making long local migrations or movements for the purpose of food or breeding. When ripe the seeds of a plant, *Polygonum argyrocoleum*, which grows over an immense area in the Tigris and Euphrates valleys, forms the sole food of this Sand-Grouse and the birds resort to these places in myriads for breeding purposes, often coming great distances. Their young reared and the seeding of the *Polygonum* finished, the birds move

elsewhere, again clear the ground of the special food available and then once more move off. During heavy rains and extreme droughts similar movements occur.

In India the birds are wild and afford splendid sport but in Mesopotamia Pitman and others speak of their being tame to foolishness and, though after a month's harrying they furnished splendid sport, they still refused to desert their favourite drinking-places. Their call has been described as "caa caa," rapidly and often repeated on the wing and as an angry "twoi twoi" when disturbed or frightened.

They run well and actively on the ground and swim lightly and elegantly on the water, looking like gulls in the distance.

Pterocles exustus *.

Pterocles exustus Temm., Pl. Col., v, pls. 28 & 29 (Nos. 359 & 360) (1825).

Type-locality: Senegal.

The typical race differs from our Indian bird in being paler.



Fig. 34.—Head of *P. e. erlangeri*. ½.

(1893) Pterocles exustus erlangeri.

THE COMMON INDIAN SAND-GROUSE.

Pterocles exustus erlangeri Neum., Orn. Monatsb., p. 154 (1909) (Lahadj, South Arabia).
Pteroclurus exustus. Blanf. & Oates, iv, p. 60.

Vernacular names. *Bhat-titar*, *Bakht-titar*, *Kuma-tit*, *Kakar*, *Dangar*, *Bowrie* (Hind.); *Butabar*, *Batibun* (Sind); *Popandi* (Bhil); *Pakorade* (Mahr.); *Jam polanka* (Tel.); *Kal-Gowjal-Haki* (Can., Mysore); *Kal-kandari* (Tam.).

Description.—Adult male. Crown to upper tail-coverts isabelline-grey or isabelline-brown, darkest on the coverts, palest on the crown; lores, cheeks, chin and throat dull yellow-ochre, often tinged with orange-buff, extending to form a collar round the

* *Pterocles senegalensis* of Licht., 1823 (Verz. Doubl. p. 64) is preoccupied by *senegalensis* Shaw & Modder, 1814. We must therefore once more revert to *exustus* as the specific name.

neck, but shading off into the other parts; scapulars and inter-scapulars darker and shading into ochreous-buff at the tips, which are edged with brown; greater secondary coverts and inner secondaries buff or ochreous-buff, the latter shaded with olive on the inner webs and inside of outer webs; inner lesser coverts like the back, gradually changing to buff or ochreous on the remaining lesser, median and greater coverts, which are also margined with paler buff; edge of wing, winglet, primary coverts and primaries dark brown, the inner primaries with broad, oblique bands of white at the ends; outer secondaries brown; upper breast vinous-buff, divided from the lower breast by a narrow band of black bordered with white; lower breast dull yellow-buff, changing gradually into the chocolate of the rest of the lower plumage and the black of the centre of the abdomen; under tail-coverts and tarsi creamy-buff; central tail-feathers like the back, becoming black on the prolonged narrow portions; outer tail-feathers tipped with pale buff and with some dark freckling next the tip on the outermost pair.

Female. Upper plumage dull buff, streaked with marks of dark brown, on the hind-neck these increase to blotches and on the back and other parts become broad bars; scapulars, inner secondaries, lesser and median coverts like the back but the feathers broadly tipped with buff and some of the coverts finely edged with brown; sides of head, neck and breast more vinous and strongly spotted with black; lower breast dull pale ochre-buff; abdomen, flanks and vent rufous-buff closely barred with very dark brown; under tail-coverts creamy-buff.

Colours of soft parts. Iris dark brown; orbital skin pale yellow to pale greenish-yellow; bill and feet slaty-grey to plumbeous or lavender-blue, claws blackish.

Measurements. Wing, ♂ 171 to 193 mm., ♀ 161 to 178 mm.; tail 124 to 156 mm.; tarsus 21 to 25 mm.; culmen 11 to 13 mm. Weight, ♂ 8 to 10 oz., ♀ 7½ to 8½ oz.

Young birds have the whole of the upper parts dull buff, finely vermiculated all over with thin wavy lines of black; chin to breast earthy-buff finely barred with blackish; abdomen and flanks dull black; quills freckled with buff at the tips and inner secondaries freckled all over; greater and median coverts black edged with dark buff.

Nestling in down. Above pale ginger broken by white patterns and lines, pricked out in black; underparts isabelline-white, darkest on the throat; the pattern on the head and on the back assumes the shape of a figure of eight.

Distribution. South Arabia, South and South-West Palestine to Baluchistan and India. In our own area it occurs practically everywhere in the plains where the rainfall is not too heavy. It does not occur in Ceylon but is found in the open parts of Travancore, whilst Blanford shot them near Trichinopoly. East

it is found as far as Raneegange and Birbhum. It is common in parts of Sind and in the Punjab and has been killed in Kashmir.

Nidification. This Sand-Grouse breeds wherever there are suitable areas or open waste, desert country, fields with stubble, or fields lying fallow. Eggs have been taken in every month of the year, except perhaps August, but the principal months are March to May in the North and possibly January to March in the Bombay Presidency and the Southern Provinces. Most birds breed twice in the year at least. The eggs, normally three, are laid in slight hollows scratched by the birds, without lining and, generally, with no shadow protection by stone, clod or vegetation. Both parents incubate and during the hot hours of the day the eggs are never left uncovered. In colour they are pale grey-stone or yellowish-stone with numerous small blotches and spots of various shades of brown profusely scattered over the whole surface and with secondary markings of lavender and grey. In a few eggs the underlying grey spots predominate. Two hundred eggs average 36·8 × 26·2 mm.: maxima **40·5** × 26·1 and 34·1 × **28·2** mm.; minima **32·9** × 24·9 and 34·1 × **23·2** mm.

Habits. This Sand-Grouse is very common wherever the country is open, whether it is absolute desert or only semi-desert mixed with cultivated land. It drinks early in the morning, about two hours after dawn, and again early in the evening before sunset. Unless much shot over they are not wild birds, but big flocks (they run up to 200) can seldom be approached near enough for a shot and most sport is obtained as the birds flight to and from their drinking-places. Huge bags are sometimes obtained in this way and, as the birds are very powerful on the wing and have very dense plumage, it takes straight shooting to drop them. They feed on seeds, grain and vegetable shoots and, though dry, are good birds for the table.

(1894) Pterocles senegallus.

THE SPOTTED SAND-GROUSE.

Tetrao senegallus Linn., Mantessa, p. 526 (1771) (Senegal).
Pteroclurus senegallus. Blanf & Oates, iv, p. 61.

Vernacular names. *Nango Katingo, Gutu* (Sind.); *Kara-pat-gutu* (Jacobabad).

Description. Crown and whole upper plumage isabelline to isabelline-grey, the upper tail-coverts and sometimes the rump suffused with chrome-buff; edge of forehead, lores and round the eye grey, produced as far back as the nape, where it forms a collar and below a fainter collar surrounding the yellow ochre of the chin, throat, sides of head and neck; scapulars isabelline-brown at the base, changing to a grey penultimate band with buff or ochre tips; lesser wing-coverts dull isabelline-brown with buff tips; the innermost all buff on the visible parts; greater and median coverts

isabelline buff, with brown shafts and brownish tips; primaries the same, all but the first three tipped and edged with buff on the inner webs; secondaries brown, narrowly edged with buff on the outer webs at the ends and gradually changing until the innermost are like the scapulars, but always with yellow ochre—not buff—tips; breast, flanks and abdomen isabelline-pink, the centre of the last black; under tail-coverts white or pale buff with brown bases; central tail-feathers like the back but with the prolongations dusky black; outer tail-feathers brown with broad white tips, each succeeding pair with more and more white; tarsi buff.

Colours of soft parts. Iris brown; orbital skin yellow; bill bluish-white to bluish-grey or pale plumbeous, darker at the tip; feet bluish-white to pale plumbeous, claws blackish.

Measurements. Wing 190 to 208 mm.; tail 127 to 167 mm.; tarsus 23·0 to 25·5 mm.; culmen 11·5 to 12·5 mm. Weight up to 12 oz.

Female. Upper plumage, wing-coverts and inner secondaries a rather darker isabelline than in the male, the head with fine dark streaks; the rest of the upper parts boldly spotted with dark brown or blackish, these spots boldest and largest and often tinged with grey on the scapulars and inner secondaries, which are also tipped with chrome-yellow; the grey of the head in the male is replaced by white, marked with blackish; underparts like the male but the breast duller and spotted with black.

Measurements. Wing 176 to 197 mm. Weight up to 9 oz.

Nestling. Head, cheeks and ear-coverts a mixture as in *alchata*, but the ginger-like element much paler; back and scapulars pale sandy-yellow with heavy black tips; underparts isabelline-white.

Distribution. Algeria, through N. Africa and parts of the Sahara, North and South Nubia and Egypt, Arabia etc. to Afghanistan, Baluchistan and N.W. India. In India it is common in Sind and East of the Indies but more rare on the West. It is not rare in the Rann of Cutch and extends to Jeysulmere, Jodhpur and the Shapur District of the Punjab.

Nidification. The only definite records of this bird's breeding in India are first that of Pearson, who took two clutches of three eggs each at Kotri on May the 16th, and recently that of R. C. Bolster, who obtained young a few days old and saw others half grown in the Punjab near Ahmadpur, about 30 miles from the Indus. I have also three oviduct eggs of birds shot in Sind, where it most undoubtedly breeds regularly.

Outside our limits it breeds in many places in Mesopotamia and eggs were obtained by G. Tomlinson, Pitman, Cox and Cheesman. Unlike the larger Sand-Grouse, *alchata*, which likes a little thin cover, this bird seems to prefer absolute bare mud-flats, depositing its three eggs either in a scratching or else on the flat ground without any protection of bush or grass from the

sun. The eggs are rather dull-coloured, the ground fairly warm grey- or yellow-stone colour, the markings small blotches and irregular spots of light reddish- or yellowish-brown scattered sparsely over the whole surface. Underlying these are still more scanty markings of pale inky purple. The shape is the usual elliptical shape of all Sand-Grouse. Thirty-one eggs average 40·6×28·3: maxima **48·5**×28·0 and 41·6×**30·2** mm.; minima **36·3**×27·1 and 39·1×**26·6** mm.

It is difficult to say what is the breeding-season. Oviduct eggs have been taken in February, March and April and again in August. Pearson took his eggs at Kotri in June, whilst Pitman, Tomlinson, Cox and Cheesman took others in Mesopotamia from May to August.

Habits. The Spotted Sand-Grouse is an inhabitant of the bare desert or the wide baked mud-flats so common in Mesopotamia. Often it seems impossible for the birds to find food, yet they remain fat and strong and their crops seem to be always full of the tiny seeds which form their staple food. They drink regularly late in morning and again in the evening but often remain and breed in the open country many miles, fifty or more, from their drinking-place. Their flight is as swift as that of the other Sand-Grouse—they are active on the ground and swim well. When drinking they freely enter the water and, when breeding, soak their breasts and thus take back water to their young. The call is expressed in the name "Gutu" and Ticehurst syllabifies it as "quiddle guiddle."

Genus **SYRRHAPTES.**

Syrrhaptes Illiger, Podromus, p. 243 (1811).

Type, *Tetrao paradoxa* Pall.

The genus *Syrrhaptes* is distinguished by having no hallux and by having the very short squat toes feathered above to the tips as



Fig. 35.—Sole of foot of *S. tibetanus*.

well as the whole of the tarsus; the central tail-feathers are greatly lengthened as in the Pin-tailed *Pterocles*; the wing is long, with the first primary much the longest. Two species are known which are purely Asian but one of these makes curious irruptions into Europe having repeatedly occurred as far West as England.

Key to Species.

A. Abdomen with a large black or chocolate patch ..... *S. paradoxus*, p. 276.
B. Abdomen white ..... *S. tibetanus*, p. 277.

(1895) Syrrhaptes paradoxus.

PALLAS'S SAND-GROUSE.

Tetrao paradoxus Pall., Reise versch. Russ. Reich., ii, p. 712 (1773) (Tartary).

Vernacular names. None recorded.

Description.—Adult male. Forehead, supercilium, chin, throat and sides of head rusty-yellow, paler on the chin, deepest at the base of the throat; hinder crown and nape grey; sides of neck grey; a collar, broken at the sides of the neck, of rusty yellow; upper plumage and wing-coverts buff, the former barred with black and with chocolate-grey spots on the outer webs below the bars; longer tail-coverts with longitudinal grey markings; the tail buff barred with greyish-black, the lengthened portions blackish; lateral feathers rich buff and black on the inner webs, grey on the outer, with broad white tips and white on the outer web of the outermost pair; the edge of the shoulder of wing and sometimes the median coverts boldly spotted with black; median primary coverts tipped chestnut, forming a broad wing-bar; primaries grey, with black shafts and black outer web to the first; greater primary coverts buff with broad blackish centres; secondaries grey, more black on the inner webs with broad buff edges; breast grey, often tinged with vinous; across lower breast to back a band of almost white feathers with narrow subterminal bars of black; abdomen black, more or less patched with white; remainder of lower parts grey or vinous-grey, paling to pure white on the under tail-coverts and axillaries, the latter sometimes with black tips.

Colours of soft parts. Iris dark brown; bill very pale bluish; claws black.

Measurements. Wing, ♂ 227 to 267 mm., ♀ 213 to 237 mm.; tail 185 to 225 mm.; the central pair of feathers 80 to 118 mm. longer than the next; tarsus about 25 mm.; culmen 9 to 10·5 mm. (*Hartert*).

Female. Crown and nape, hind-neck and sides of breast spotted or streaked with black; a narrow black line between the yellow throat and grey breast. No black and white band across lower breast; the median and lesser coverts are more or less spotted with black; otherwise as in the male.

Distribution. From the South Russian Steppes to Transbaikalia and Mongolia. In Winter it wanders very far West and birds have frequently reached England and many parts of Western Europe. Its only record for India is that of the Nawab of Dhar, who shot a single specimen.

Nidification. Pallas's Sand-Grouse breeds in Siberia from March to August and is said to have two or more broods in the year. The nest, like that of other Sand-Grouse, is just a shallow scratching in the bare soil of deserts but is said to be sometimes lined with a little grass. The eggs, three in number, are perfect ellipses; the ground-colour is yellowish- or brownish-stone, rather sparsely marked all-over with reddish- or purplish-brown blotches and spots and secondary marks of purplish-grey. Jourdain gives the average of seventy-one eggs as 42·1 × 29·6 mm.

Habits. Very similar to that of other Sand-Grouse. They collect in large or small flocks and often in the Spring migrate in vast numbers, apparently more in an East to West movement than North to South. In their abnormal irruptions into Western Europe the birds seem to stay and breed until wiped out by various causes and do not attempt a return migration.

(1896) Syrrhaptes tibetanus.

THE TIBETAN SAND-GROUSE.

Syrrhaptes tibetanus Gould, P. Z. S., p. 92 (1850) (Ladakh in Tibet); Blanf. & Oates, iv, p. 63.

Vernacular names. *Kuk*, *Kaling* (Ladak); *Kaka Lingma*, *Kakali* (Tibet).

Description.—Adult male. Head from forehead to nape and hind-neck white, finely barred with black, the forehead more streaked; lores white or obsoletely streaked; upper back vinaceous-buff, the barring of the neck changing to fine vermiculations; lower back, rump and upper tail-coverts greyish-white vermiculated with narrow black bands, broadest on the rump, which, with the coverts, is often tinged with yellow; scapulars, wing-coverts and innermost secondaries buff, tinged with rufescent except on the lower and median coverts, the whole finely vermiculated with brown and the scapulars also marked with large patches of black on the inner webs, forming a narrow triangular patch on the back; primary coverts and primaries black, the latter greyish towards their ends and with large greyish-buff marks on the inner webs of all but the first four, though fainter on the fifth and sometimes on the sixth; outer secondaries grade from the inner to the colour of the primaries; fore-neck and breast vinous-grey or vinous-white, barred with dark brown or blackish, the bars very narrow towards the lower breast, where they disappear; abdomen, flanks and shorter under tail-coverts white; longer tail-coverts barred chestnut and black and tipped white; thigh-feathers white with tiny brown vermiculations; central tail-feathers like the rump, the narrow parts dark grey; remaining tail-feathers barred chestnut and black and tipped white; axillaries black.

Colours of soft parts. Iris brown; bill and nails bluish-horny; sides whitish.

Measurements. Total length about 490 to 510 mm.; wing, ♂ 254 to 270 mm., ♀ 248 to 260 mm.; tail, ♂ 203 to 263 mm., ♀ 203 to 216 mm.; tarsus about 27 to 30 mm.; culmen 16 to 20 mm.

Female. Differs from the male in having the chin and throat albescent and more or less barred; the breast is barred throughout and there is no immaculate band of grey between the barring and the white abdomen; the upper parts and wing-coverts are regularly barred rather than vermiculated.

In both sexes the prevailing tint varies greatly, some males having a beautiful pink tinge, others more ochraceous, others more grey.

Young birds are barred as in the female and the yellow on the breast is wanting.

Distribution. Ladak, Lahul, Tibet and Sikkim; North to the Pamirs and Koko Nor.

Nidification. The Tibetan Sand-Grouse breeds between 12,000 and 16,000 feet in Ladak and Tibet on stony plateaux and ridges, laying three eggs in a hollow scratched in the soil. Occasionally a stone or tuft of withered grass may serve as a wind-break but generally the nest and eggs are quite exposed, though their close resemblance to the surrounding stones makes concealment unnecessary. The site selected is always one on leeward side of a ridge and is said to be nearly always near the top. The breeding-season is from the middle of May to the end of June, most eggs being laid in the latter month. In colour the eggs are pale stone-colour, tinted with brown, yellow or, rarely, pinkish, sparsely covered with small blotches of light or dark reddish-brown with others underlying them of pale neutral tint. In shape they are ellipses or long narrow eggs equally pointed at either end. Thirty eggs average 49·2×31·9 mm.: maxima **54·0×31·2** and 48·5×**34·6** mm.; minima **44·0×29·0** mm.

Habits. These Sand-Grouse are found between 12,000 and 17,000 feet during Summer, descending 2,000 feet lower in Winter. They inhabit the most inhospitable stony wastes and hill-sides but are not shy birds and, when shot at during the heat of the day, fly but a short distance and are easy again to approach. They consort in small flocks of three or four to twenty, these sometimes joining in still bigger flocks. Their call-notes have been syllabified as "yak-yak caga-caga," uttered most frequently on the wing. Their flight is very rapid and their thick plumage is very shot-resisting but when shot they are excellent to eat. Their own diet consists of grass, seeds and shoots.

VI. Order GALLINÆ.

The Order *Gallinæ* contains the whole of the true land Game-birds, including the Megapodes or Mound-birds but not the *Turnicidæ* or Bustard-Quails. In the present Order will be found the Peafowl, Jungle-fowl, Pheasants, Spur-fowl, Partridges, Quail and Megapodes—all represented within our limits,—besides the Grouse and many others, of which none enter our Indian region and the Grouse alone Asia.

All the genera contained in this Order are birds with strong well-built legs, well fitted for progress on the ground; the tarsus is often furnished with one or more spurs, in some cases on that of the male only, in others on those of both sexes. The hallux or hind-toe is always present and the nails are in all but the *Megapodiidæ* short, blunt, very strong and almost straight on their lower outline; the wings are rather short and rounded, the first primary very little longer or shorter than the tenth or last; the fifth secondary is always present.

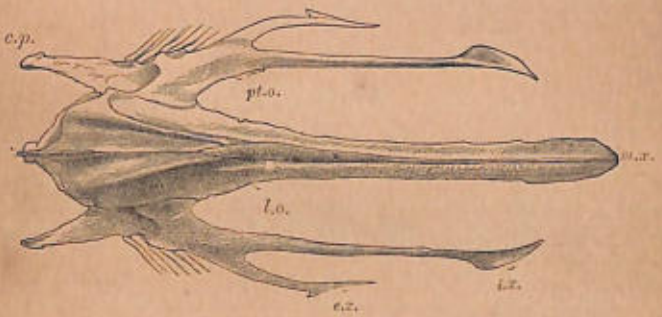


Fig. 36.—The sternum of *Lophophorus refulgens* (Huxley, P.Z.S. 1868, p. 297): *r.*, rostrum; *c.p.*, costal process; *pt.o.*, metosteon; *e.x.*, external xiphoid process; *i.x.*, internal xiphoid process; *l.o.*, lophosteon, bearing the carina (or keel) and ending behind in *m.x.*, the middle xiphoid process.

The great majority of these birds lay their eggs on the ground, but the Megapodes make huge mounds in which they bury their eggs, whilst the Tragopans nest on trees. The young are hatched covered with down or feathers and can run about within a few moments of being hatched.

The body-feathers possess an aftershaft; the spinal feather-tract is well defined on the neck and continued down the back. An oil-gland is present except in *Argusianus*.

The deep plantar tendons are connected by a fibrous vinculum but divide again, the *flexor perforans digitorum* to supply the three front toes and the *flexor longus hallucis* the hallux. The

ambiens muscle, accessory femoro-caudal, semi-tendinosus, and accessory semi-tendinosus are always present and the femoro-caudal on all but the Peafowl and Turkeys.

The palate schizognathous, the nostrils holorhinal. True basi-pterygoid processes are wanting but there are sessile facets situated far forward on the sphenoidal rostrum; cervical vertebræ 16.

The sternum has two deep incisions on the posterior border on each side of the keel; the inner xiphoid process between the two is shorter than the outer, which is bent over the inner ribs and is expanded at the end. The episternal end of the rostrum is completely perforated to receive the inner ends of the coracoids.

The Order *Gallinæ* is divided into two Suborders, *Alectoropodes* and *Peristoropodes*.

Key to Suborders.

A. Inner notch of sternum more than half the length of the entire sternum. Hallux raised above level of anterior digits.	**Alectoropodes**, p. 280.
B. Inner notch of sternum less than half the length of the entire sternum. Hallux and anterior digits on the same level ..	**Peristoropodes**, p. 436.

Suborder **ALECTOROPODES.**

The principal external feature in which this Suborder differs from the next, the *Peristoropodes*, consists in the hind-toe being raised above the level of the others and in being much shorter, the basal phalanx being shorter than that of the middle or third toe.

The inner posterior notch on each side of the sternum is more than half the length of the latter.

This Suborder is usually divided into two families, the *Phasianidæ*, containing all but the Grouse, and the *Tetraonidæ*, containing these birds. This family has, however, no representative in India and the advisability of its separation need not therefore be discussed.

Family PHASIANIDÆ.

Characters those of the Suborder.

The division of this family into Subfamilies is one of considerable difficulty but it is so big a group that to retain all in one seems neither scientific nor desirable from the point of view of facility of study by the student. I retain therefore the divisions suggested by Beebee and adopted by myself in my 'Game-birds.' These follow four natural divisions containing (1) the Peafowl, (2) the Argus Pheasants, (3) the Pheasants and (4) the Partridges.

Key to Subfamilies.

Moult of rectrices commencing:—

A. With the first pair	*Pavoninæ*, p. 281.
B. With the third pair	*Argusianinæ*, p. 285.
C. With the outermost pair	*Phasianinæ*, p. 293.
D. With the central pair	*Perdicinæ*, p. 340.

Alternative Key to Subfamilies.

A. Feathers of tail, or tail-coverts, with large metallic ocelli.	
a. Wing over 480 mm.	*Pavoninæ*, p. 281.
b. Wing under 480 mm.	*Argusianinæ*, p. 285.
B. No ocellations on tail or tail-coverts.	
c. Wing over 200 mm.; tail longer than wing except in *Lophohorus* and *Lophura* ..	*Phasianinæ*, p. 293.
d. Wing under 200 mm. except *Tragopan*, *Ithagenes* and *Tetraogallus*; tail much shorter than wing, except in *Tragopan*, in which they are equal	*Perdicinæ*, p. 340.

Of the exceptions in this key *Lophurus* and *Lophophorus* are both big birds with crests and with a wing over 280 mm., a combination not occurring in the *Perdicinæ*. In the latter Subfamily *Ithagenes* and *Tetraogallus* have the wing very much longer than the tail, whilst birds of the genus *Tragopan* can always be distinguished by their fleshy horns and wattles.

Subfamily PAVONINÆ.

In this Subfamily the two species which it contains commence their moult of the tail with the fifth pair of tail-feathers. The males are distinguished by the immense length of their upper tail-coverts during the breeding-season.

Genus PAVO.

Pavo Linn., Syst. Nat., 10th ed. i, p. 156 (1758).

Type, *Pavo cristatus* Linn.

The birds of this genus are distinguished by their erect occipital crest of feathers and the greatly lengthened upper tail-coverts of the males; the tail is long, slightly graduated and of twenty feathers; wings rounded, the first quill shorter than the tenth; tarsus very long and strong and armed with a spur. The genus is found in India, the Indo-Chinese countries and the Malay Archipelago.

Key to Species.

A. Crest-feathers ending in spatulate, half-moon-shaped drops ..... *P. cristatus*, p. 282.
B. Crest-feathers ending in points ..... *P. muticus*, p. 284.

(1897) Pavo cristatus.

THE COMMON PEAFOWL.

Pavo cristatus Linn., Syst. Nat., 10th ed. i, p. 156 (1758) (India orientali); Blanf. & Oates, iv, p. 68.

Vernacular names. *Mor*, *Manjur* (Hind.); *Taus* (P.); *Landuri*, ♀ (Mahr.); *Manja*, *Manir*, ♀ (Uriya); *Mabya* (Bhut); *Mong-yung* (Lepcha); *Moir*, *Moira* (Assam); *Dode-yung* (Garo); *Dao-di-yung* (Cachari); *Voh-té* (Mikir); *Myl* (Tam.); *Mimili* (Tel.); *Nord* (Can.); *Monara* (Cing.).

Description.—Adult male. Feathered portion of head dark metallic green-blue changing to brilliant deep blue on the neck, breast and shoulders, shaded according to the light with green and purple-blue; back to rump brilliant light bronze-green, each feather black-edged, those next the neck with central blue streaks and those of the rump with wide sub-edges of metallic golden-green; tail dark brown with paler mottling next the shafts; central upper tail-coverts, composing the train, bronze-green with a copper sheen near the tips, each feather with an eye formed by a deep blue heart-shaped spot with four rings of brilliant smalt blue-green, golden-bronze, gold and brown; the outer feathers and the longest of the central ones have no eyes but terminate in a broad half-moon; a few of the outer coverts have indefinite, deep copper-coloured ocelli; scapulars, inner secondaries and most of the coverts buff with dark brown bars, definite and glossed with green on the scapulars and adjacent coverts, broken and glossless elsewhere; outer secondaries, median and greater coverts dark brown glossed with deep metallic blue; primaries and primary-coverts pale chestnut-brown; lower breast deep purple-blue, changing to deep metallic green on the abdomen and flanks; vent and under tail-coverts dull brownish-black.

Colours of soft parts. Iris dark hazel-brown; bare skin of face livid white; bill dark horny, darkest at the tip and along the culmen; legs and feet greyish-brown to dark horny-brown; claws blackish.

Measurements. Total length to end of true tail about 3' 6", or to end of upper tail-coverts 6' to 7' 6"; wing 444 to 495 mm.; tail 383 to 458 mm.; tarsus about 127 to 139 mm.; culmen about 37·5 to 42·5 mm. Weight 9 to 11¼ lb.

A train of a Peacock formerly in my possession, shot in Malda, measured 5' 3" in length.

Female. Top of head mostly dark chestnut, each feather bordered with golden-brown, paler on the neck; remainder of upper plumage brownish, marked and barred with brownish-white and buff; primaries and tail-feathers dark brown with paler tips; lower breast and abdomen whitish-buff.

Measurements. Wing about 395 to 425 mm. Weight 6 to 9 lb.

Young males resemble the females but have the primaries chestnut as in the males, though mottled with brown.

Young bird 9 weeks old. Top of head pale sandy with black bases to the feathers; crest about 12 mm. long, black at the base, brownish-chestnut on the terminal half and tipped with black; general colour of the upper parts light brown, barred and freckled with brownish-black; under surface of the body yellowish-white, browner on the chest.

Chick in down. Pale buff; a dark brown mark across the nape from one eye to the other; back deeper rufous-brown; wing pale dull chestnut mottled with brown.

The form known as *nigripennis* differs in having the scapulars and wing-coverts black with narrow green edges; thighs black; back more golden.

I do not consider this constitutes a subspecies; the form, probably melanistic, breeds true, as also do albino individuals in many cases.

Distribution. Practically the whole of India and Ceylon with the exception of the Trans-Indus in the extreme North-West and in the districts of Bengal East of the Bay. It occurs, though it is rare, in the forests on the tidal rivers of Mymensingh and Barisal and at one time was obtained in Nadia. In the Santhal Parganas and Chota Nagpur it is becoming rare but it is still plentiful in the wilder parts of many districts in Bengal. In Comilla and Tippera Peafowl have been shot but were probably *P. muticus*, as this is the form found in Chittagong and the Lushai Hills.

Nidification. The breeding-season of the Peafowl is generally from the end of June to September. In Ceylon they lay from January to April and in the sub-Himalayas in March and April. In its wilder state, where it is not sacred but hard-hunted, the

Peafowl makes its nest in forest with dense undergrowth but close to streams. Elsewhere it breeds in almost any kind of country; round villages, in thick crops, scrub- or bamboo-jungle and even in the long grass of the mango-groves. Normally the nest is on the ground but they have also been found in the hollows between the branches of huge trees, in deserted Vultures' nests and even on the roof of old buildings. The eggs number four to six, rarely three to eight. They vary in colour from very pale cream to a warm buff or café-au-lait and in shape are broad ovals. Eighty eggs average 69·5×52·0 mm.: maxima 76·2×54·1 and 73·4×58·9 mm.; minima 61·2×43·1 mm.

Habits. The Peafowl is common up to about 5,000 feet in the lower hills of the Himalayas and has been found up to nearly 7,000 feet but in the Assam Hills seldom goes above 2,500 feet. It is naturally one of the most wary of birds and more difficult to approach and circumvent than the wildest of game-animals. Where sacred they become little more than barn-door fowls and are quite unworthy of a shot. They are polygamous and except when the hens are sitting are generally found in small family flocks of four to eight but sometimes two or three of these may be seen feeding together. They fly well and, once launched, at good speed but trust more to their legs to escape from man, winding their way through the densest jungle at a great pace in spite of their immense trains. They are omnivorous and though chiefly grain-, berry- and bud-eaters, will take any insect, frog, lizard etc. they come across. For the table they are useless unless under a year old.

(1898) **Pavo muticus.**

THE BURMESE PEAFOWL.

Pavo muticus Linn., Syst. Nat., 12th ed., p. 272 (1766) (Java); Blanf. & Oates, iv, p. 70.

Vernacular names. *Doun*, *Udun* or *Udaung* (Burm.); *Marait* (Talain); *Tusia* (Karen); *Bourong-marah* (Malay); *Pegu-majura* (Calcutta).

Description. — Adult male. Head and extreme upper neck brilliant metallic blue-green; neck, upper breast and mantle golden-bronze, each feather centred deep bluish-purple bordered with verdigris-green and edged with the same; on the upper mantle the blue centres show up boldly and the feathers are broadly edged with black; back emerald-green, each feather centred bronze and edged with black; wing-coverts next the back similar to it; other coverts deep metallic blue-green changing to bronze-copper on the coverts of the inner secondaries; winglet, greater-coverts and primaries light chestnut with dark brown shafts and tips; secondaries dark brown with a metallic-green sheen on the visible portions; tail dark brown, mottled paler next the shafts; tail-coverts forming the train similar to those of the

common Peacock; lower breast bronze, each feather edged and centred with deep blue-green; flanks duller, deeper green fading to dull brownish-black on the middle of the abdomen, vent, under tail-coverts and thighs.

Colours of soft parts. Iris dark brown or hazel-brown; orbital skin bluish-green; naked cheeks yellow to pale orange; bill dark horny brown, darker at tip and paler at the base; legs and feet dark grey-brown or horny-brown, claws blackish.

Measurements. Wing 175 to 506 mm. Weight 8·5 to 11 lb.

Female. Has no train. The whole back and rump is brownish-black, more or less barred and marked with buff, the feathers next the scapulars with faint metallic-green edges; the bronze and black borders of the breast are broken and less conspicuous; the primaries and chestnut feathers of the wing are mottled on the outer webs; the upper tail-coverts are no longer than the tail and are mixed with brown and bright buff; tail brown with paler bars and tips.

Young male is like the female but the feathers of the lower back are greenish-bronze and the upper tail-coverts are golden-green tipped with bronze.

Distribution. The whole of Burma, Siam, Cochin China, the Malay Peninsula, Java and, possibly, Sumatra. North it is found, though it is rare, in Looshai, Chittagong and the Chittagong Hill Tracts. It used to occur in Manipur and there are a few—descendants of imported birds—in the North Cachar Hills.

Nidification. Similar to that of the preceding bird but the eggs are always laid in dense forest. The season varies. Blanford gives June to September as the favourite months near Moulmein, Gairdner found them during April in Siam and Cook took eggs in this month and March in the Shan States. Hopwood speaks of them as "swarming along the Little Tenasserim river in March where they were breeding." The eggs, three to five in number, are indistinguishable from those of the last bird. Twenty eggs average 73·4×53·6 mm.: maxima **79·3**×55·0 and 75·6×**55·2** mm.; minima **67·4**×51·0 mm.

Habits. Those of the preceding species. It is nowhere held sacred and is accordingly extremely wild and shy. In Burma it keeps almost entirely to dense forests bordering rivers and streams. Its cry is a loud trumpet-like cat-call, quite similar to that of the Indian bird.

Subfamily ARGUSIANINÆ.

The present Subfamily consists of birds of grey plumage with ocelli of metallic colour, brilliant in the male but duller or obsolete in the female. The tail-feathers vary in number from twelve to twenty-four.

The sides of the head and face are more or less naked; the tarsus is long and powerful, sometimes with one or more spurs, sometimes with none; the plumage is very soft and lax.

The tail-moult commences at the third pair and then proceeds outwardly and inwardly simultaneously.

Key to Genera.

A. Secondaries longer than primaries; tail-feathers twelve ..... ARGUSIANUS, p. 286.
B. Secondaries no longer than primaries; tail-feathers twenty to twenty-four ..... POLYPLECTRON, p. 289.

Genus ARGUSIANUS.

Argusianus Rafinesque, Analyse, p. 210 (1815).

Type, *Phasianus argus* Linn.

The genus *Argusianus* is distinguished from all other Indian game-birds in having the secondaries much longer than the primaries, in the male bird the former being nearly twice the length of the latter; the central tail-feathers are nearly twice the length of the next pair, the remaining pairs being graduated.

(1899) Argusianus argus.

THE ARGUS PHEASANT.

Phasianus argus Linn., Syst. Nat., 12th ed., i, p. 272 (1766) (Malacca).
Argusianus argus. Blanf. & Oates, ii, p. 71.

Vernacular names. *Quon, Borong Quon, Kwang* (Malay); *Kyek* or *Kyet-wah* (Siam, Bankasoon).

Description.—Adult male. Centre of crown from forehead to nape black, the latter forming a small crest; feathers of the neck sparse, barred black and white, the latter changing to rufous next the back; sides of head, chin, throat and sides of neck nearly bare with fine shaft-like feathers scattered thinly over the whole surface; upper back, scapulars and wing-coverts blackish-brown; barred and edged with buff and dark rufous; lower back, rump and shorter tail-coverts rufous-buff very finely edged and boldly spotted with black, the tail-coverts palest and dullest; longest outer tail-coverts white, densely covered with kidney-shaped spots of black centred with buff; primaries purple-grey changing to buff on the innermost, freely spotted with black and buff kidney-shaped markings, most numerous on the outer webs and bases; on the inner webs there is a broad line of pale rufous or cinnamon densely spotted with small white specks, this line shortest on the first primary, longest on the innermost, fine bars of black connect this band with the blue shafts; outer secondaries like the pri-

marles but with broad white margins to the inner webs and the spots on the outer web developed into black bands; on the outer webs near the shafts there are ocelli of iridescent buff, green-grey and purple surrounded with black and with an outer ring of pale buff; the inner secondaries are without ocelli and are mottled black, rufous and brown with white spots, over all of



Fig. 37.—*Argusianus argus.*

(From the group in the British Museum.)

which there is a faint purple sheen; on each of the secondaries there is a broad ill-defined band of deep purple with white spots and specks and faint rufous bars; central rectrices black shading to rufous-chestnut on the edge of the outer web and to pale grey on the inner web; both webs spotted with white, the spots smaller and surrounded with black on the outer webs, tips dull white; remaining tail-feathers blackish speckled with white and indistinctly mottled; breast to vent chestnut-rufous, dotted with black and white on the fore-neck, mottled and barred with black elsewhere; centre of vent dull unmarked ashy.

Colours of soft parts. Iris brown, hazel or greenish-brown; bare skin of head and neck dull pale slate to bluish-grey or bluish-plumbeous; bill light bluish-horny; legs and feet pale dull crimson-pink to vivid red or coral-pink.

Measurements. Wing to end of primaries 444 to 495 mm. to end of secondaries anything between 760 and 920 mm.; central tail-feathers up to 1422 mm., generally about 1150 to 1250 mm.; tarsus about 105 to 115 mm.; culmen about 33 to 37 mm. Weight 4½ to 5½ lb.

Females. Forehead to nape dull rufous-buff, the feathers edged black, more pronounced down the centre of the crown; a crest of bristly dark grey feathers; nape bright chestnut-rufous, the bases of the feathers vermiculated darker; mantle less bright and more vermiculated, the upper back, scapulars and wing-coverts about equally black and rufous, the latter colour paling posteriorly; lower back, rump and upper tail-coverts with more definite bars of black mottled with buff; primaries chestnut, speckled with black on both webs, but brighter on the outer web; secondaries boldly mottled black and buff, tinged with chestnut on those next the primaries; below chestnut, bright and almost immaculate on the fore-neck and dullest and inclined to buff on the flanks and abdomen, very finely stippled with dull rufous.

Colours of soft parts. Skin of head and neck dull grey or plumbeous to dark blue; legs and feet pale vermilion or litharge-red; bill horny-white or greyish-white.

Measurements. Wing 300 to 330 mm., to end of secondaries 355 to 394 mm.; culmen about 31 to 35 mm.

Young males are like the female but with no crest and with a longer tails.

Chick in down. Below rufescent-brown, paler on chin and albescent on vent; forehead rich rufous-brown, head the same vermiculated with rufous-brown; upper back darker, lower back and rump velvety blackish-brown with two lines of pale buff from the scapulars to the tail.

Distribution. The Malay Peninsula, Sumatra and the extreme South of Siam and Tenasserim. Hopwood says that the local people knew it as far North as Tavoy.

Nidification. Practically nothing known. It certainly breeds in dense forest and probably throughout the year as suggested by Davison. The full clutch of eggs will possibly prove to be two or three only but hens in captivity lay four or five. Two eggs were taken by Waterstradt's natives in dense jungle on the 20th May and 2nd July and another egg was laid by a recently caught female on the 27th March. One of these eggs is a very faint buff, the other two creamy-white; in shape they are long well-pointed ovals with a fine close texture. They measure 69·1 × 46·3, 67·3 × 42·4 and 61·3 × 44·0 mm. Some eggs of this Pheasant laid in confinement are said to be a rich coffee-colour.

Habits. The Argus Pheasant is a bird of the densest forests and both sexes appear to be solitary. The cock-bird makes for himself a displaying ground some six to ten yards square which he keeps free of all vegetation and it seems probable that the hens resort to these places when the desire for reproduction impels them. The display of the Argus is very magnificent and has been described by several naturalists, but especially by Seth Smith, so that it is now well known. Davison says the call of the male sounds like "how-how" repeated ten or a dozen times, whilst that of the female is "oowhoo-how-oo-whoo." The food consists of fallen fruit, insects, ants, slugs, etc.

Genus **POLYPLECTRON** *.

Polyplectron Temm., Pig. et Gall., ii, p. 363 (1813).

Type, *Pavo bicalcaratus* Linn.

The genus *Polyplectron* contains Pheasants of grey, grey-brown or buff plumage, freely vermiculated or barred with darker and with metallic-coloured ocelli on the wings and tail.

The tail consists of 20 to 24 feathers, the central ones greatly exceeding the others in length, graduated to the outermost and shortest; the inner secondaries are almost as long as the primaries but not greatly lengthened as in *Argusianus*; the sides of the face are bare; the tarsi are long and strong and are armed with two or more spurs on each leg; the plumage is soft and lax.

The females only differ from the males in being duller and less ornamented with ocelli.

Key to Species.

A. Crest of short hairy feathers in both sexes.	*P. bicalcaratum*, p. 289.
B. Crest of pointed metallic feathers	*P. malaccensis*, ♂, p. 292.
C. No crest	*P. malaccensis*, ♀, p. 292.

Polyplectron bicalcaratum.

Key to Subspecies.

A. General colour more buffy-brown.....	*P. b. bicalcaratum*, p. 289
B. General colour more grey and less buff..	*P. b. bakeri*, p. 291.

(1900) Polyplectron bicalcaratum bicalcaratum.

THE BURMESE PEACOCK-PHEASANT.

Pavo bicalcaratus Linn., Syst. Nat., 10th ed. i, p. 156 (1758) (Thoungyah, Burma, Lowe).
Polyplectrum bicalcaratum. Blanf. & Oates, iv, p. 72.

Vernacular names. *Katmor* (Chittagong); *Down-kulak*

* This genus has been fully reviewed by Dr. P. Lowe (see, 'Ibis,' 1925, pp. 476 to 483).

(Arrákan); *Yit* (Burm.); *Shive-deung'* (Tenasserim); *Wograw* (Kachin).

Description. Whole upper plumage buffy-brown; the hairy feathers of the head and neck are finely vermiculated with buffy-white or buff and the rest of the upper surface with pale buff spots, which tend to collect and to form indefinite bars on the lower back, rump and upper tail-coverts; the feathers of the mantle, the wing-coverts, except the outermost lesser coverts, and the inner secondaries with violet green-blue ocelli at their tips, each ocellus surrounded with a narrow brownish-black band and a second broader one of white; similar ocelli on the tail-feathers in pairs an inch, or rather more, from the tips; these ocelli are larger than those on the mantle, oval in shape and greener in colour with an outer ring of pale brown instead of white; chin, throat and sometimes the fore-neck pale buff; remainder of lower plumage like the back but with the bars better defined on the breast and flanks; on the under surface of the tail the ocelli show as blackish blots.

Colours of soft parts. Iris white or pearl-grey; facial skin yellowish flesh-colour, sometimes more reddish; bill black at the tip and on the culmen, remainder creamy flesh-colour; legs and feet dark slaty or greenish-plumbeous to blackish.

Measurements. Total length about 560 to 760 mm.; wing 203 to 228 mm.; tail 304 to 402 mm.; tarsus about 72 to 78 mm.; culmen 17·5 to 19 mm. Weight about 1¾ to 2 lb.

Female similar to the male but duller and with the ocelli less brilliant, the rings of black and white being replaced by broken bars; the ocelli on the shorter tail-feathers are obsolete; the pale buff or white on the throat is more extensive; the crest more developed and more feathery. Very old females are sometimes almost indistinguishable from males except for their shorter tails.

Colours of soft parts. Iris brown, grey-brown, or grey; bare skin dull fleshy; legs and feet paler.

Measurements. Wing 177 to 203 mm.

Chicks in down. Above dark chestnut with two faint darker streaks down the sides of the back with broad streaks of buff outside them; below pale buff; a dark spot on each wing.

Distribution. Chittagong, Chin and Kachin Hills South to North Tenasserim, East to Siam.

Nidification. I have eggs taken in Tenasserim in March and in Upper Burma in April and the nidification does not appear to differ in any way from that of the next bird. My eggs vary from 45·4×37·0 to 50·9×38·3 mm.

Habits. Similar to those of the Sikkim race.

(1901) Polyplectron bicalcaratum bakeri.

THE BHUTAN PEACOCK-PHEASANT.

Polyplectron bicalcaratum bakeri Lowe, Ibis, 1925, p. 477 (Bhotan Duars).

Polyplectrum chinquis. Blanf. & Oates, iv, p. 73 (part.).

Vernacular names. *Monnowar, Deyodahuk, Deoderick* (Assam); *Deo-durrug* (Garò); *Dao-dip, Dao-dai-dip* (Cachari); *Burumimrui* (Kacha Naga).

Description. Both sexes differ from the preceding form in being much greyer and much less buff in colour. Most of the buff markings are replaced with white.

Colours of soft parts and **Measurements** about the same as in the Burmese form.



Fig. 38.—Head of *P. b. bakeri*, ♂. ⅔.

Distribution. Sikkim, Bhutan to East Assam, Cachar, Sylhet and Manipur. Comilla birds are intermediate whilst Chittagong birds are nearer true *Polyplectron bicalcaratum.*

Nidification. The Peacock-Pheasant breeds in great numbers all along the lower hills of Assam and the adjoining plains, where the ground is more or less broken and the jungle dense. The two favourite nesting-sites are ravines in forest with very dense undergrowth and the thick tangled secondary growth on deserted cultivation. It breeds very rarely up to 4,000 feet but its real haunts are below 2,000 feet in the hottest, wettest jungles. The first few eggs are laid in March, most in April and a few as late as June. No nest is made as a rule, just a pile of leaves and rubbish scraped together in some natural hollow, but Clarke describes a nest made of twigs and leaves lined with feathers, sufficiently well built to bear removal. The normal clutch is two eggs but I have myself taken nests with three to five eggs, whilst Coltart took one containing six, or, so far as we could judge, were these the product of more than one bird. The eggs are like small, richly-coloured eggs of the domestic fowl but nearly all have the whole surface minutely stippled with small chalky pits, which give

them a very distinctive character. They are exceptionally thick-shelled heavy eggs. Forty average 46·5×35·9 mm.: maxima 50·3×37·0 and 48·2×38·1 mm.; minima 43·2×35·0 and 44·0×34·0 mm.

Habits. This Peacock-Pheasant has been recorded at an elevation of 6,000 feet in the Darjiling Hills, but it is seldom it found over 4,000 and is common below 2,000 feet, where haunts dense forest and jungle. It is a most inveterate skulker and a first-rate runner, so that without dogs it is almost impossible to flush. On the wing it is slow and heavy, though it gets up a considerable velocity when it swoops down the face of a steep hill. Its call-note is a deep guttural "hoo" rapidly repeated and it has a large vocabulary of low, soft, chuckling notes. Its food consists of insects, worms, beetles, small frogs, grain and seeds etc. and its flesh, though rather dry, is very well flavoured. The display of this Pheasant is very beautiful, both wings being fully expanded with the tail, so that the whole looks like a beautifully-ocellated fan. The wide tail is used as a screen for the young birds, who move about under its shelter close to the heels of the parent. They are, I think, monogamous and probably pair for life.

(1902) Polyplectron malaccensis.

THE MALAY PEACOCK-PHEASANT.

Phasianus malaccensis Scop., del. Flor. et Faun., Insubr., ii, p. 93 (1786) (Malacca).

Vernacular names. *Gou-ga-san* (Siam).

Description. Head and nape mottled buff and dark brown; a well-developed crest of metallic-green feathers; neck and extreme upper back narrowly barred buffish-white and dark brown; remainder of upper parts rich rufous-buff, dotted everywhere with black and the feathers of the mantle and most of the wing-coverts with ocelli at their tips; these ocelli blue-green, surrounded by black and with an obsolete outer ring of buff; the ocelli on the tail are similar to those of the Grey Peacock-Pheasant but run into one another instead of being well divided by the shafts, whilst many of the outer tail-feathers have ocelli on the outer web only; on some of the longer rectrices the colour above is richer than below the ocelli; the lower plumage is browner and more uniform than in the preceding species; the lower neck and breast are boldly mottled and the under tail-coverts more boldly still, with black blotches near their tips; the chin and throat are dull buff.

Colours of soft parts. Iris white; orbital skin dull red; bill dark horn-brown, culmen blackish and tip black; legs and feet dull greenish-black to black.

Measurements. Wing 180 to 213 mm.; tail 254 to 330 mm.

Female. Above from forehead to neck dull brown; the centres paler; there is no crest; upper plumage as in the male but less

mottled, the hind-neck and extreme upper back being only vermiculated brown and buff; the ocelli on the back are replaced by brownish-black markings and those on the tail are smaller and less brilliant; under tail-coverts mottled brown and buff, the former in broad bars; chest and throat pale buffy-brown.

Measurements. Wing 164 to 181 mm.; tail 152 to 229 mm.

Distribution. Malay Peninsula and Sumatra to the extreme South of Tenasserim, Pechaburi and Ratburi in S.W. Siam.

Nidification. An egg taken by one of my collectors in Tenasserim on the 3rd March measures 45·7 × 35·3 mm. and was one of a pair found in dense evergreen-forest, the hen bird being trapped in them. One egg was broken. There is nothing on record about the nidification of this species, though this is sure to resemble that of *bicalcaratum*.

Habits. Those of the genus.

Subfamily PHASIANINÆ.

This Subfamily contains the true Pheasants and the game-birds most closely connected with them. The moult of the tail-feathers commences with the outermost pair. With the exception of this character it is not easy to differentiate between the Pheasants and the Partridges as groups, though the typical forms are so well marked. Taking them as a whole the Pheasants are big birds with a wing of over 8 inches and the tail is longer than the wing in all genera except *Lophophorus* and *Lophura*. The *Perdicinæ*, or Partridges, on the other hand, are all smaller birds with a wing under 8 inches, except *Ithaginis*, *Tetraogallus* and *Tragopan*.

Of the *Phasianinæ* the two exceptions, *Lophophorus* and *Lophura* are both big birds with crests and with a wing of over 11 inches, a combination found in no *Perdicinæ*. In the latter group the exceptions *Ithaginis* and *Tetraogallus* have the wing very much longer than the tail, whilst the birds of the genus *Tragopan* can always be distinguished by the possession of peculiar fleshy horns and wattles.

Key to Genera.

A. A fleshy erect comb on the crown of the male ..... GALLUS, p. 294.

B. No fleshy comb on the crown of the male; no ear-tufts.

a. Tail longer than wing in both sexes, much longer in males and much graduated.

a'. No occipital crest; first primary longer than tenth.

a''. Feathers of rump rounded; bare skin of face not forming wattles.. SYRMATICUS, p. 302.

b''. Feathers of rump lanceolate; bare skin of face developed into wattles. PHASIANUS, p. 305.

b'. An occipital crest; first primary shorter than tenth.
c''. No cape of erectile feathers over nape ..... CATREUS, p. 307.
d''. A cape of erectile feathers covering nape and shoulders ..... CHRYSOLOPHUS, p. 314.
b. Tail slightly longer than wing in males, subequal or shorter in females; graduated.
c'. Sides of head feathered ..... PUCRASIA, p. 309.
d'. Sides of head naked.
e''. Crest an erect brush-like tuft of feathers; rump of male fiery-red ..... LOPHURA, p. 316.
f''. Crest of long recumbent feathers; no red on rump..... GENNÆUS, p. 319.
c. Tail rounded, not longer than wing in either sex ..... LOPHOPHORUS, p. 334.
C. No comb or crest, but well-developed ear-tufts ..... CROSSOPTILON, p. 339.

Genus GALLUS.

Gallus Brisson, Orn., i, p. 166 (1760).

Type, *Phasianus gallus* Linn.

The genus *Gallus* contains the true Jungle-fowl, of which there are four species confined to the Indo-Malayan region, and of these three occur within our area.

The males are all furnished with a fleshy crest or comb and with two wattles or lappets hanging from each side of the throat, as in our Indian forms, or with a single one as in the species *varius*. The tail consists of fourteen feathers in all our species, of sixteen in *varius*. The central tail-feathers are greatly lengthened with pliant shafts, so that they droop in a graceful curve; the whole tail is sharply compressed; the feathers of the neck and rump are long and lanceolate; the wings are rounded, the first primary shorter than the tenth, the fifth the longest; the legs are long and powerful, the tarsus being longer than the middle toe and claw combined and, in the males, furnished with a long sharp spur.

Key to Species.

A. Comb and spurs highly developed.
a. Neck-hackles red, or golden-red with no spots.
a'. Breast black ..... *G. bankiva*, ♂, p. 295.
b'. Breast reddish-orange ..... *G. lafayettii*, ♂, p. 300.
b. Neck-hackles blackish with golden bars or spots..... *G. sonneratii*, ♂, p. 298.
B. Comb and spurs rudimentary.
c. Breast rufous-brown with pale shaft-lines ..... *G. bankiva*, ♀, p. 295.
d. Breast mottled brown and black and white ..... *G. lafayettii*, ♀, p. 300.
e. Breast white, each feather edged with brown ..... *G. sonneratii*, ♀, p. 298.

The names which the Red Jungle-fowl should bear have been much discussed recently but I follow Rothschild (Nov. Zool. xxxiii, p. 206, 1926) in discarding the name *ferrugineus* for any of the races, as it was founded on a bird, described by Sonnerat, which could not under any circumstances have been a Jungle-fowl. On the other hand, Linnæus's name *G. gallus* was applied to the domestic fowl and this was again divided by him into several varieties, of which *pusillus*, if any, is apparently applicable to the Indian Game-cock, *Gallus pugnax*. Admittedly *pugnax* is here used merely as an adjective and cannot be used as a name, either *binomial* or *trinomial*. Nor, however, can *gallus* be used, because, first, it is applied to domestic fowls of ALL kinds and, secondly, because if we use it at all, on the present system we must use it for the first-described bird, which has no relation whatsoever to any known wild form of *Gallus*. The types of domestic fowls Linnæus divides up as β, γ, δ etc. and the first name undoubtedly is α, although this letter is omitted, and it is the only one to which *Gallus* can be applied. The final description beginning "*Gallus pugnax*" certainly refers to a Game-cock and this he calls *pusillus*. I consider it quite impossible to use *gallus* as a specific name for any wild form of this genus. We must accordingly use *bankiva* Temm., 1813, the next oldest name which becomes available. *Ferrugineus* being inapplicable, the name *robinsoni* of Rothschild (in *loc. cit.*) must be employed, leaving Kloss's *murghi* for the Indian race.

Gallus bankiva.

Gallus bankiva Temm., Pig. et Gall., ii, p. 246, pl. 87 (1813) (Java).

This form differs from either of our Indian races in having the ends of the hackles of the neck spatulate or truncate.

Key to Subspecies.

A. Neck-hackles much pointed and more golden-yellow on the terminal thirds .... *G. b. murghi*, p. 295.
B. Neck-hackles less pointed and deeper golden-red on the terminal thirds ..... *G. b. robinsoni*, p. 298.

(1903) Gallus bankiva murghi.

THE COMMON RED JUNGLE-FOWL.

Gallus ferrugineus murghi Robinson & Kloss, Rec. Ind. Mus., xix, p. 14 (1920) (Behar).
Gallus ferrugineus. Blanf. & Oates, iv, p. 75 (part.).

Vernacular names. *Jungli Murgha*, *Bun Murgha* ♂, *Jungli Murghi*, *Bun Murghi* ♀ (Hin., Upper India); *Bun-kokra*, *Bun-*

Kukra (Beng.); *Bun-kukur* (Assam); *Natsa-pia*, *Nagseya* (Bhut.); *Paz-ok-chi*, *Tankling* (Lepcha); *Bir-sim* (Koles); *Gera-gogur* ♂, *Kuru* ♀ (Gond.); *Lall* (Chunda Dist.); *Ganga* (Ooria); *Daono* (Cachari); *Voh* (Kuki); *Inrui* (Kacha Naga).

Description.—Adult male. Crown of head, nape, upper mantle and sides of neck deep bright orange-red changing to reddish-gold or orange on the longest hackles, which are marked with black down their centres; upper back black glossed with blue or green; lower back deep maroon-red, highly glossed and gradually changing into fiery-orange on the long hackles of the rump the centres of these hackles black but concealed by those overlying them; upper tail-coverts and tail black, brilliantly glossed with green, blue-green or copper-green, the blue generally dominant on the coverts and all gloss absent or obsolete on the outermost tail-feathers; least wing-coverts and shoulder of wing black glossed like the back; median wing-coverts like the lower back; greater coverts black; quills dark brown or blackish, the primaries edged on the outer web with light cinnamon, outer secondaries with much broader edges and the innermost glossy blue-green; under plumage blackish-brown faintly glossed with green.

Colours of soft parts. Iris reddish-brown, red or orange-red; comb brick-red to scarlet-crimson; wattles a rather more livid red; lappets white, sometimes touched with pink; skin of head bluish or fleshy-red; bill dark horny-brown, the base and gonys reddish; legs and feet greenish-grey to deep slaty-brown. Breeding-birds have much brighter soft parts than in the non-breeding season.

Measurements. Wing 203 to 244 mm.; tail between 300 and 380 mm.; tarsus about 70 to 80 mm.; culmen 18 to 22 mm.; the spur generally about 25 mm., occasionally as much as 50 mm. Weight about 2 lb. up to 3 lb.

Post-nuptial plumage. The cock sheds the neck-hackles and long tail-feathers, the former being replaced with black feathers, which also often appear in patches in the body-plumage. This moult occurs in June or July normally and the full plumage is again assumed in October.

Immature males have the hackles less developed and their black centres more conspicuous; their colour also is paler, the cinnamon on the quills is darker and both these and the greater coverts are powdered with blackish.

Males in first plumage like the female.

Female. Top of the head blackish-brown, the feathers broadly edged with golden-yellow; in most birds the forehead is more or less metallic crimson, this sheen being produced back as supercilia to behind the ear-coverts, where they widen and meet on the fore-neck as a broad gorget; feathers of nape orange-yellow with broad blackish centres, changing to pale golden-yellow on the

longer hackles; upper plumage, wing-coverts and inner secondaries reddish-buff or reddish-brown with pale shafts and dark brown vermiculations; primaries dark brown edged with rufous; tail dark brown, mottled with dull rufous, absent on the outer pairs; breast dull Indian red with pale shaft-lines shading to dull cinnamon on the abdomen, much vermiculated with brown; under tail-coverts black or blackish-brown.

Colours of soft parts. Iris brown; comb and small wattles, sometimes absent, dull crimson; bill horny-brown, base and gape plumbeous-fleshy.

Measurements. Wing 177 to 196 mm.; tail 110 to 165 mm. Small spurs are sometimes present.

Chick in down. A broad central streak from crown to tail plum-brown; a streak of the same colour through the eye and down the sides of the neck; lateral bands of buff; sides of body rich warm reddish-buff changing to pale buff on chin, throat and centre of addomen; bill fleshy-yellow, legs olive-green.

Distribution. The lower ranges of the Himalayas from Kashmir to East and South Assam; North and East Central Provinces, Western Bengal, Chota Nagpore, Behar and Orissa; Mundla, Raipur, Bastar and South to the Godavery. The range of this Jungle-fowl coincides with the range of the Sal Tree (*Shorea robusta*) and the habitat of the Swamp-deer (*Cervus duvauceli*).

Nidification. The height of the breeding-season is from the end of March to May but eggs may be found at odd times from January to October and many birds must breed twice. They breed throughout their plains habitat and in the Himalayas up to 7,000 feet but not often above 5,000. The eggs are laid on the ground, either on a mass of fallen leaves and rubbish in a hollow, scraped together by the birds, or just on the ground with no bed at all. Occasionally the nest is inside a clump of bamboos two to four feet from the ground. As a rule the site is selected in dense undergrowth, either forest or scrub, but I have seen the eggs quite in the open, lying on dead leaves in bamboo-jungle. One hundred and fifty eggs average 45·3×34·4 mm.: maxima **52·0**×35·5 and 46·3×**41·1** mm.; minima **39·6**×33·2 and 44·0×**32·0** mm. In appearance they are like small warmly-coloured eggs of the domestic fowl. The number of eggs laid is usually five to seven, occasionally as many as eight or nine and often only four. It is very doubtful if Jungle-fowl are always polygamous. I have often seen cock-birds with the hens when the latter are sitting and I have also often seen both cock and hen with the young, feeding and looking after them.

Habits. The Jungle-fowl lives in forest but feeds whenever possible in cultivation round about the edges of it. During the heat of the day they sleep in the forest on some tree or clump of bamboos but from dawn to about 9 A.M. and again from 3 or

4 P.M. until dusk they may be seen wandering about in the crops. They form good sport when driven, though they are inveterate runners and extremely wild and clever in eluding the guns. The call is a sharp quick-ending replica of the crow of the domestic fowl and they have the usual conversational notes of the genus but, though both sexes cackle wildly when frightened, the hens do not cackle after laying an egg. Their diet is principally grain, seeds and shoots of plants but they also eat insects, worms, lizards, frogs, small snakes, crabs, etc. Their flesh is much superior to that of the domestic fowl for the table, though rather dry.

(1904) Gallus bankiva robinsoni.

THE BURMESE JUNGLE-FOWL.

Gallus gallus robinsoni Rothschild, Nov. Zool., xxxiii, p. 206 (1926) (Sumatra).
Gallus ferrugineus. Blanf. & Oates, iii, p. 76 (part.).

Vernacular names. *Taukyet* (Burm.).

Description. Differs from the Indian bird in having the plumage above a deeper red, the neck-hackles being less orange or yellow at the tips. These hackles are also less attenuated. The ear-lappets are always red or deep fleshy-pink, not white. This character, however, according to Robinson and Kloss, is not of much value.

Colours of soft parts and **Measurements.** Except for the ear-lappets the same as in *G. b. murghi.*

Distribution. The whole of Burma, Yunnan, Siam, Cochin China, Annam and the Malay Peninsula to Sumatra.

Nidification. Similar to that of the preceding bird. In the plains the breeding-months are November to March and in the hills, higher up, March and April. Forty eggs average 43·2 × 33·9 mm.: maxima **47·0** × 34·2 and 43·5 × **36·0** mm.; minima **40·0** × 32·7 and 42·1 × **31·1** mm. As a series the eggs of the Burmese Jungle-fowl are much paler buff than those of the Indian bird.

Habits. Similar to those of the preceding bird.

(1905) Gallus sonneratii.

THE GREY JUNGLE-FOWL.

Gallus sonneratii Temm., Pig. et Gall., ii, p. 246 (1813) (India); Blanf. & Oates, iv, p. 77.

Vernacular names. *Jungli-murgha* ♂, *Jungli-murghi* ♀ (Hind.); *Komri* (Mt. Aboo); *Parda Komri* (Gondhi, Chanda

Dist.); *Ran-Kombada* ♂, *Ran-Kombadi* ♀ (Marati); *Kombadi* (Deccan); *Kattu-Kozli* or *Koli* (Tam.); *Adavekodè* (Tel.); *Koli*, *Kad-Koli* (Can.); *Geera-Kur* (Marie Gond.).

Description.—Adult male. Feathers at the side of the forehead dull rufous; head, neck and hackles of the extreme upper back black, with grey fringes to the bases and with numerous bars of golden-yellow on the nape, neck and shoulders changing to pure white on the back; on the longer feathers the black bars are glossed with purple-blue; back, rump and wing-coverts black fringed with grey, with broad white shaft-streaks and the majority of the feathers with concealed longitudinal grey streaks; longest and lateral rump-feathers fringed chestnut, glossed with purple and spotted with pale yellow or white; upper tail-coverts black, glossed with violet, purple and blue and edged with buff and chestnut; median wing-coverts and scapulars black, barred on the basal half with grey and with white shafts expanding at their tips into flat spatulate plates of orange-yellow about 25 mm. long by 5 mm. wide, the majority of which have deep red fringes on the outer side; greater coverts and quills blackish-brown; the innermost secondaries and coverts with white shafts and sometimes freckled with whitish near the tips; lower parts from the hackles to the vent dark brown or blackish with white shaft-streaks and grey or grey-white edges to the feathers; feathers of the posterior flanks and a few on the abdomen with orange-rufous edges; feathers of vent and centre of abdomen dull rufous-brown; under tail-coverts black with white edges.

Colours of soft parts. Iris yellow to bright red; culmen black, the upper mandible at the base and most of the lower mandible yellowish-horny; legs and feet yellow or reddish-yellow; claws black.

Measurements. Wing 220 to 254 mm.; tail 330 to 375 mm.; tarsus about 70 to 75 mm.; culmen about 24 to 27 mm. Weight 1¾ to 2½ lb.

Female. Upper part of the head dull pale brown, rufescent on the forehead and with faint white streaks; neck golden-brown, feathers white-shafted and with brown bands on each web, increasing in size on the mantle; whole upper plumage and wings finely vermiculated pale sandy-brown and dull black; tail dull rufous-black mottled with rufous on the edge of the central tail-feathers; below white, each feather edged with dark brown and slightly speckled with the same; flanks mottled sandy-brown and brown with broad white central streaks.

Colours of soft parts. Rudimentary comb and bare skin of face brick-red to dull crimson; otherwise as in the male but the legs more yellow.

Measurements. Wing 200 to 215 mm.; tail about 150 to 175 mm.

Young males are like the female but more rufous and more boldly blotched and barred.

Male in post-nuptial plumage has no long tail-feathers and the neck-hackles are replaced with short dull brownish-black feathers.

Chick in down. Similar to that of the Red Jungle-fowl but the lateral bands almost white and the sides and lower parts dull grey.

Distribution. Southern India as far North as Mount Abu on the West and the Godavery on the East. It is found in Central India and Rajputana, whilst South it occurs very nearly to the extreme South of Travancore.

Nidification. The principal breeding-months are February to May, except in the Western Nilgiris, where eggs are laid from October to December; both eggs and young may, however, be found in almost every month of the year. The nidification is very similar to that of the Red Jungle-fowl and the birds lay, like them, from four to seven eggs but occasionally as many as ten or as few as three. The eggs are like domestic fowls' eggs, pale fawn to warm buff, a few eggs being sparsely and irregularly freckled and spotted with light, dark or reddish-brown. Sixty eggs average 46·3 × 36·5 mm.: maxima **51·0** × 36·1 and 49·0 × **38·0** mm.; minima **43·0** × 34·3 and 46·1 × **33·1** mm.

Habits. Very similar to those of the preceding species but it is much less gregarious and generally keeps in pairs or small family-parties. Their crow is quite different to that of *Gallus bankiva* and Davison syllabifies it as "kuck-kaya—kaya-kuck," ending with a low "kyukun kyukun," repeated slowly and softly. Like other Jungle-fowl they assemble in great numbers in areas where bamboos are in seed. They are said not to be very pugnacious.

(1906) Gallus lafayettii.

THE CEYLON JUNGLE-FOWL.

Gallus lafayettii Lesson, Traité d'Orn., p. 491 (1831) (India).
Gallus lafayetti. Blanf. & Oates, iv, p. 77.

Vernacular names. *Weli-kukula* ♂, *Weli-kikili* ♀ (Cing.); *Kada-Koli* (Tam.).

Description.—Adult male. Crown dull orange-rufous; feathers at base of naked throat rich violet-purple; hackles on neck and upper back orange-yellow, shading into this from the rufous head and again into fiery orange-red on the back, the yellow feathers with black central streaks and the red with rich maroon; lower back and rump darker, almost copper-red, the centres to the feathers deep violet-blue; the central and least lanceolate feathers have a broad terminal patch of violet-blue; a few of the longest

tail-coverts black, narrowly edged fiery-red; tail black, glossed with deep blue or blue-green; lesser wing-coverts like the neck, grading into the median, which are like the back; greater coverts black, mottled rufous and black on the concealed portions; breast and flanks like the back, the short feathers near the abdomen rufous-chestnut with broad black terminal bands; vent and centre of abdomen dull brown-black with paler tips; thighs black, the feathers fringed chestnut; under tail-coverts glossy blue-black.

Colours of soft parts. Iris light golden-yellow; face, throat and wattles livid or purplish-red, comb bright red with a large interior yellow patch; bill brownish-red, the tip and lower mandible paler; legs and feet wax-yellow to pale yellowish-brown.

Measurements. Wing 216 to 241 mm.; tail 230 to 406 mm.; tarsus about 80 to 88 mm.; culmen about 20 to 23 mm. Weight 1¾ to 2½ lb.

Female. Forehead dull rufous-red; crown dull brown with fine black specks; nape, sides of neck and sparse feathers of throat dull rufous; mantle blackish-brown with pale shaft-streaks and golden-buff edgings; remainder of upper plumage pale buff, rufous-buff or rufous-brown vermiculated all over with black, the tail more boldly marked with black glossed with green and the greater coverts boldly barred with black and pale buff; primaries and outer secondaries pale brown mottled on the outer webs with black and buff; inner secondaries vermiculated brown and buff in the centre, boldly barred with black and buff on both webs and showing chestnut marks here and there; a black patch below the throat; upper breast and flanks vermiculated black and rufous-brown; remainder of abdomen, breast and thigh-coverts white, each feather edged with black and with black bars near the base.

Colours of soft parts. Iris olive-yellow; bill dark brown above, yellowish below; legs and feet brownish-yellow.

Measurements. Wing 165 to 183 mm.

Young males like the female but more rufous below.

Distribution. Ceylon only.

Nidification. The Ceylon Jungle-fowl breeds throughout the year and Wait has taken or seen eggs in every month. The nesting of this Jungle-fowl is very peculiar, for it builds its nest more often off the ground than on it. A favourite site is a high stump of a dead tree, the top of which has been hollowed out by weather, but Parker took one nest, possibly an old nest of a Hawk or Crow, 30 feet from the ground. Every collector except Legge refers to this curious habit and it seems to be well known to the natives. Occasionally eggs are found on the ground but this is exceptional. The number of eggs laid is two or three, very rarely four and the large clutch of nine eggs found by Beebe must have been *arranged* for him. Even fours are so rare that in nearly fifty years' collecting I have failed to get a four clutch and Wait has seen but one. This, however, exactly what we should

expect to find once we are acquainted with its peculiar nesting-habits. The eggs are unlike those of other Jungle-fowl in being almost invariably well spotted and freckled with light reddish or dull purple-grey; generally the markings are minute and numerous everywhere, sometimes larger and more scanty. Forty eggs average 46·3 × 34·5 mm.: maxima 49·5 × 39·8 mm.; minima 42·1 × 35·0 and 43·1 × 32·0 mm.

This species is apparently polygamous and takes no interest in eggs or chicks.

Habits. The Ceylon Jungle-fowl is a resident bird alike in the plains of Ceylon and in the highest hills, and frequents any sort of forest-, scrub- or bamboo-jungle. They are as pugnacious as the Red Jungle-fowl and are often enticed within shot by imitating the sound of their wings clapping together, a challenge, with their call of "chuck-joy-joysee," to all other cocks within hearing. They feed on the same miscellaneous menu as the other species and are said to be often caught intoxicated from having eaten the seeds of the common *Strobilanthes*.

Genus SYRMATICUS.

Syrmaticus Wagler, Isis, 1832, p. 1229.

Type by monotypy, *Phasianus reevesi* Gray.

This genus is divided from the true Pheasants of the genus *Phasianus* in having the rump-feathers compact and rounded instead of long, lanceolate and hairy in character. The bare space round the eye in the males is never developed into wattles as it is in those birds. The characters are slight but are now universally accepted, even by the "lumpers," as sufficient and I also accept them for the sake of uniformity.

In the birds of these two genera there is no crest; the tail of 16 or 18 feathers is very long and strongly graduated and is not compressed; the wings are rounded, the first primary being intermediate in length between the 7th and 10th; the face is bare in the male, feathered in the female; the tarsi are long and stout, the male having long spurs often showing as blunt knobs in the females; the sexes are not alike.

Four species are generally placed in this genus which are all Eastern Asiatic forms, one only coming into the Indian fauna.

Syrmaticus humiæ.

Key to Subspecies.

A. Rump steel-blue and white in equal portions ..... *S. h. humiæ*, p. 303.
B. Rump black and white, the latter predominating ..... *S. h. burmanicus*, p. 304

(1907) Syrmáticus humiæ humiæ.

MRS. HUME'S PHEASANT.

Callophasis humiæ Hume, Str. Feath., ix, p. 461 (1881) (Manipur).
Phasianus humiæ. Blanf. & Oates, iv, pp. 80, 480 (part.).

Vernacular names. *Yit* (Burm.); *Wuri* (Kachin); *Loe-nin-koi* (Manipur).

Description.—Adult male. Crown brown tinged with olive, darker all round the bare orbital skin and faintly glossed with green; chin and upper throat black; upper breast and upper back deep velvet-black with broad edges of deep steel-blue; lower back and rump steel-blue, paler than the back and each feather edged with white and with a broad white bar bordered with black; upper tail-coverts grey, faintly vermiculated with white and with an obsolete broken black bar across the centre; tail vermiculated grey, with black bars more or less mottled with chestnut on the central pair of feathers; four outer pairs with a broad subterminal bar of chestnut and the two, or three, outermost pairs mottled with white at the tips; lesser and median wing-coverts like the back, the former with a broad band of white, narrowly edged with steel-blue and with bases of glossy blue-black, the latter with a black band glossed with steel-blue; greater coverts deep chestnut, edged white and sub-edged white near the quills; primaries brown edged chestnut; secondaries chestnut, the innermost tipped white and sub-tipped black; lower breast like the back, changing to deep bright chestnut on the abdomen and flanks; thighs and centre of the abdomen mottled brown and chestnut; under tail-coverts black with a faint blue-green gloss.

Colours of soft parts. Iris brown to orange; orbital skin deep crimson; bill greenish-horny, tipped paler and darker on base and culmen; legs and feet delicate drab.

Measurements. Wing 206 to 224 mm.; tail 401 to 535 mm.; tarsus 58 to 66 mm.; culmen 25·5 to 29 mm.; spur 8·3 to 17·7 mm. Weight 2 lb. 6 oz.

Female. Head above reddish-brown, the crown streaked with black; sides of the head and lores dull fulvous, spotted posteriorly with black; neck sandy-brown, obsoletely barred with blackish above, boldly barred on the sides; upper back and scapulars sandy-brown with bold velvety-black edges and bars and with white arrow-shaped marks in the centre of the feathers; lower back, rump and upper tail-coverts mottled sandy-brown and black with indefinite black centres to the feathers, more pronounced on the rump, where and on the coverts there are also a few white marks; central tail-feathers the same as the coverts with faint mottled bars of dark brown; outer tail-feathers chestnut with broad black bars and white tips; breast sandy- or greyish-brown with a few black spots; lower breast, flanks and

thigh-coverts sandy-rufous, barred with very pale grey; lower thigh-coverts darker brown; vent and centre of the abdomen duller than the flanks; shorter under tail-coverts mottled brown, white and sandy; longest coverts chestnut with black bars and broad white tips; visible plumage of the wings mottled grey, brown and sandy-rufous with bold markings of black; median and greater coverts edged whitish, forming narrow wing-bars; primaries brown, mottled with rufous and with pale buff bars on the outer webs.

Colours of soft parts. Small bare space round the eye red.

Measurements. Wing 198 mm.

Distribution. Manipur, Patkoi Naga Hills, Lushai Hills and North Burma West of the Irrawaddy, South to Haka in the Chin Hills.

Nidification. Mrs. Hume's Pheasant breeds during April and May in the Chin Hills on ridges above 6,000 feet up to the highest on Mt. Victoria, roughly about 10,000 feet. There is no nest, the eggs being laid on the wind-blown leaves and rubbish in some natural hollow in the ground under a bush, rock or patch of grass. They breed principally in thin stunted forest without much undergrowth but very broken and rocky. The eggs number six or seven to ten and are like small fowls' eggs, not in the least like the eggs of true *Phasianus*. In colour they vary from very pale buff, almost white, to a rather warm buff. Forty eggs (mostly Mackenzie's measurements) average 48·7×35·3 mm.: maxima **51·5**×36·3 and 49·5×**37·5** mm.; minima **46·0**×33·7 and 48·5×**33·2** mm.

Habits. This beautiful Pheasant is found in the mountains between 4,000 and 10,000 feet, frequenting thin forest and open grass-land, either all grass, three feet or so in height, or grass with trees scattered here and there. Always, however, it seems to prefer very broken rocky ground on steep hill-sides. Its flight is said to be slower than that of the European Pheasant and it flies low, in and out of, rather than over, the tree-tops. Its call is said to be a low grunting note and no one seems to have heard them crow. It feeds on acorns, seeds, berries, roots and shoots as well as on all kinds of insects, worms, etc.

(1908) Syrmaticus humiæ burmanicus.

THE BURMESE BARRED-BACK PHEASANT.

Callophasis burmanicus Oates, Ibis, 1898, p. 124 (Ruby Mines).
Phasianus humiæ. Blanf. & Oates, iv, p. 80 (part.).

Vernacular names. *Vit* (Burma), *Wuri* (Kachin).

Description.—Adult male. Similar to the preceding bird but with the steel-blue of the upper parts confined to the extreme upper back and much more sharply defined from the copper-

coloured mantle; the rump is black and white instead of blue and white and the gloss, if present at all, is a much deeper blue than in Mrs. Hume's Pheasant; the white fringes also are broader.

Colours of soft parts. The same as in *S. h. humiæ*.

Measurements. Wing 215 to 236 mm.

Female not distinguishable from that of the preceding bird. Wing 195 to 210 mm.

Distribution. Northern Burma East of the Irawaddy, Shan States and Yunnan. It has been found South of Taungyi, Fort Stedman and Loimai, and a pheasant, probably this, has been seen in the Bree country.

Nidification. Unknown.

Habits. Similar to those of the last bird. Rather gregarious, associating in small flocks, perhaps family-parties, in the broken and rocky hill-country between 4,000 and 9,000 feet.

Genus **PHASIANUS.**

Phasianus Linn., Syst. Nat., 10th ed. i, p. 158 (1758).

Type, *Phasianus colchicus* Linn.

The differences between *Phasianus* and *Syrmaticus* have already been given.

(1909) **Phasianus elegans.**

STONE'S PHEASANT.

Phasianus elegans Elliot, Ann. & Mag. Nat. Hist. (4) vi, p. 312 (1870) (Setchuan); Blanf. & Oates, iv, p. 81.

Vernacular names. *Wucru* (Kachin); *Too-ka* (Tibet).

Description.—Adult male. Crown from forehead to nape and hind-neck bronze-green, the ear-tufts darker and more blue; chin and throat deep green; neck in front and on the sides deep purple-blue with purple-copper reflections in some lights, this colour passing round the base of the neck as a collar behind; upper back golden chestnut, changing into deep chestnut on the back and scapulars; feathers next the neck centred with black and the tips notched with the same; feathers of the back and scapulars with black centres outlined in buff and obsoletely notched at the tips with black; lower back, rump and upper tail-coverts pale green-grey with subterminal bars of lustrous emerald-green, each feather black at the base marked with crescentic buff bands; tail-feathers rufous-brown with broad black bars, narrowly edged with golden-buff; the central feathers have wide borders of pink-grey, across which the bars become dull crimson-purple; on each succeeding pair the pink edges are reduced in width and are absent on the

outermost pair, or two or three outer pairs. Wing-coverts pale green-grey with an emerald gloss; innermost greater coverts splashed with maroon, broadly on the outer webs, narrowly on the inner; quills brown, primaries barred with buff on the outer webs and with broken bars of the same on the inner webs; secondaries broadly edged with olive-brown and irregularly marked with buff on both webs; breast deep glossy green, each feather narrowly margined with velvety black and with black terminal notches; flanks and sides of the breast golden-copper, almost purple-copper next the breast, with black edges and terminal black shaft-streaks: vent, thighs and centre of abdomen dull brown; under tail-coverts chestnut marked with black.

Colours of soft parts. "Legs and feet of the male lead-colour, inclining to flesh-colour; naked skin round the eye scarlet" (*Elliot*).

Measurements. Wing 210 to 229 mm.; tail 391 to 487 mm.; tarsus 63 to 68 mm.; culmen about 28 to 32 mm.

Female. Crown and neck dark brown or black with narrow bars of buff, sometimes tinged chestnut; back and scapulars chestnut with white sub-edging, fine black edging and a bold bar of black between the chestnut and the white; remainder of upper plumage pale grey-brown with narrow buff edges and black centres, here and there a tinge of chestnut showing; central tail-feathers pale olive-brown with narrow pale cross-bars broadly margined on either side with black; remaining tail-feathers dull chestnut with similar bars; chin and throat pale buff, obsoletely barred with dark brown; fore-neck and upper breast with bolder bars and centres of black, washed with a pinkish tinge; lower breast, flanks and abdomen dull greyish-buff with numerous faint vermiculations of grey-brown and with conspicuous centres of deep chestnut-brown; under tail-coverts the same marked with chestnut.

Measurements. Wing 198 to 208 mm.; tail 246 to 272 mm.

Distribution. Western Setchuan, Eastern Tibet at least as far West as Batang; Yunnan, Kachin Hills, North Shan States and part of South Shan States as far South as 21°.

Nidification. Unknown. Seven eggs laid by captive birds in Inglis's aviary are like those of the common *Phasianus colchicus*, though less pyriform. In colour they are pale coffee-brown and two eggs given to me measure 44·4×34·3 and 44·4×34·0 mm. Forrest took five eggs at Lichiang in Yunnan.

Habits. Stone's Pheasant is common from Ta-tsien-lu to West Yunnan between 4,000 to 8,000 feet, either in thin open forest or in mixed scrub and bracken on broken hill-sides. They have a harsh guttural chuckle but also a crow just like that of our English bird. It is found singly, in pairs or in small coveys. Davies found them at Li-tang up to 10,500 feet.

Genus CATREUS.

Catreus Cabanis, Ersch. u. Grubers Encl. i, liii, p. 281 (1851).

Type by monotypy, *Phasianus wallichii* Hardw.

The genus *Catreus* contains a single species of Pheasant very closely allied to *Phasianus* but differing from that genus in having a long full crest. The tail is long and not compressed and is composed of 18 feathers, the central pair very long and about five times the length of the outermost; the wing is rounded, the first primary shorter than the tenth and the fifth longest; the tarsi are strong and are furnished with spurs occasionally showing as knobs in the female. The sexes differ slightly.

The only species known is confined to the Himalayas.



Fig. 39.—Head of *C. wallichii*, ♂. ½.

(1910) Catreus wallichii.

THE CHEER PHEASANT.

Phasianus wallichii Hardw., Trans. Linn. Soc., xv, p. 166 (1827) (Almorah).
Catreus wallichi. Blanf. & Oates, iv, p. 82.

Vernacular names. *Kahir*, *Chihir* (Nepal); *Cheer* (Kuman, Garhwal and further West): *Bunchil*, *Bonchil*, *Herril* (Hills N. of Mussoorie); *Chummun*, *Chaman* (Chamba, Kulu, etc.); *Reear* (Karnar, Drawa, Pir, Punjab and Kaji Nag); *Rehar* (Darg, N.W.F.).

Description.—Adult male. Top of head and crest blackish-brown, edged paler and tipped with grey; upper nape the same but with the grey tips larger; line below bare orbital space and ear-coverts hair-brown, almost black next the bill; chin, throat and neck greyish-white, faintly centred with brown streaks and barred with black on the lower nape and hind-neck; scapulars and lesser wing-coverts barred ashy-grey and black, narrowly fringed with grey and the subterminal black bar glossed with green; upper tail-coverts and tail pale buffy-grey, purer grey at the tip, barred broadly with mottled black and dark ashy-grey; outer tail-feathers with chestnut replacing the grey on the inner webs; quills brown, the outermost primaries edged and barred with pale buff on the outer webs and mottled and barred on the inner web, mottlings increasing on the inner secondaries; these have a broad

subterminal bar of black and less well-defined second bar; greater and median wing-coverts more buff, sometimes almost rufous; below greyish-white, more or less tinged posteriorly with rufous buff; fore-neck and breast with concealed bars which become very conspicuous on the lower breast and flanks; the feathers of the breast also have faint brown stripes; centre of abdomen blackish, more or less mottled with buff-rufous; vent and under tail-coverts rufous; thigh-coverts dull rufous-buff.

Colours of soft parts. Iris golden-hazel to orange-brown; orbital skin crimson or crimson-scarlet; bill pale yellowish-brown, rarely pale brownish- or bluish-horny; legs plumbeous or greyish-brown, sometimes fleshy-brown; toes paler.

Measurements. Wing 235 to 269 mm.; tail 388 to 584 mm.; tarsus 74 to 78 mm.; spur about 12·5 mm.; culmen about 25 to 30 mm.; crest up to 91 mm.

Female. Head like the male but with ochre edges to the feathers; hind-neck and nape greyish-white with bold black centres; mantle pale chestnut, each feather cream-shafted, edged grey and with bold black bars; lower back and rump ashy-brown mottled with black and a little buff; tail and upper tail-coverts with alternate bands of mottled rufous and black and bolder bars of black and buff; longer tail-coverts with more black and less buff; primaries brown barred with buff on the outer and with chestnut on the inner webs; secondaries mottled black and chestnut-brown with four broad bars of creamy-buff, edged above and below with black; greater and median coverts mottled black and chestnut-buff with broad tips of creamy-buff; chin, throat and fore-neck creamy white; breast black, the feathers edged and streaked with white; remaining lower plumage pale chestnut, edged with creamy-buff; flanks anteriorly like the breast, posteriorly like the abdomen; under tail-coverts pale rufous, slightly mottled with brown; facial skin brick-red.

Measurements. Wing 223 to 245 mm.; tail 317 to 468 mm. Weight: males, 2 lb. 10 oz. to 3 lb. 7 oz., rarely 4 lb. (*Rattray*); females, 2 lb. to 2 lb. 12 oz.

Distribution. The Himalayas from Hazara on the North-West Frontier to Simla States, Tehri Garhwal and West Nepal. How far it penetrates to East Nepal is not known but probably right up to Sikkim, for in 1894 some live birds were brought into Darjiling for sale by Nepalese. In some parts of Kashmir it is not uncommon, Col. H. L. Haughton having shot them in Karnar and Darwa as also at Pir Panjal and Kaji Nag.

Nidification. This Pheasant breeds from April to June between 5,000 and 9,000 feet, occasionally both higher and lower. They make no nests but lay their eggs on the ground, selecting very rough and broken ground at the foot of cliffs or on precipitous rocky hills and always in undergrowth where they are most difficult to find. The cock-birds are monogamous and assist the hens in the care of the young. The broods number six to

fourteen, generally eight to ten. The eggs are a very pale yellow-grey stone-colour, often lightly freckled at the larger end with reddish, the spots sometimes scattered over the whole egg. Forty-eight eggs average 53·4×39·3 mm.: maxima 56·2×40·1 and 56·0×40·6 mm.; minima 49·9×38·2 and 54·0×36·8 mm.

Habits. The Cheer may be always found between 6,000 and 9,000 feet, wandering down to 4,000 in Winter and up to 11,000 feet in Summer. They haunt the wildest country and though not frequenting the deepest forest they keep to precipitous ravines, broken hill-sides and cliffs where there is ample forest of a light, rather stunted character, with dense undergrowth in the pockets and hollows; at other times they resort to hill-sides covered with long grass and scattered oak-forest. They consort in small coveys and after they have been once flushed are very hard to force to fly a second time, either trusting to their legs to run or squatting close hidden until the beaters have passed. Mountaineer syllabifies their fine crow as "chir-a-pic cheer-a-pic chir chir chirwa chirwa" and they have also chuckling cries. They feed on roots, grubs, insects, seeds and berries and are themselves excellent for the table, whilst from the point of sport they rank with the best, having great speed on the wing and the usual Indian Pheasant habit of hurling themselves headlong downhill.

Genus **PUCRASIA.**

Pucrasia Gray, List Gen. B., p. 79 (1841).

Type, *Satyra macrolopha* Less.

The genus differs from the preceding three genera in having much longer upper tail-coverts and a much shorter tail, the central feathers of which are only about twice as long as the outermost. The head has a well-developed crest and two long plumes of feathers starting from above the ear-coverts. The sides of the face are feathered, not naked. The wings are normally rounded and the second about equals the eighth; the tarsus is short and is armed with a short blunt spur not possessed by the female. I accept four species of the genus, one only of which occurs within our limits *.

Pucrasia macrolopha.

Key to Subspecies.

A. Head fully crested; two long ear-plumes.
  a. Sides and flanks principally grey.
    a'. No red nuchal collar..... *P. m. macrolopha*, ♂, p. 310.
    b'. A red nuchal collar ..... *P. m. biddulphi*, ♂, p. 312.
  b. Sides and flanks principally black .. *P. m. nipalensis*, ♂, p. 312.
  c. Sides and flanks principally chestnut. *P. m. castanea*, ♂, p. 313.

* 'Game-birds of India,' Bomb. Nat. Hist. Soc. Journal, vol. xxv, pt. 4, p. 521 (1918). *P. meyeri* and *P. xanthospila* might possibly occur within the limits of this work and full descriptions will be found in the journal above quoted.

B. Crest very short; no ear-plumes.
d. Outer pairs of tail-feathers with black markings more or less following contour of feathers ..... *P. m. macrolopha*, ♀, p. 310.
e. All except outermost pair with black markings forming bars ..... *P. m. biddulphi*, ♀, p. 312.
f. All except outermost pair chiefly chestnut on the outer web, and blackish, white-tipped on the inner. *P. m. nipalensis*, ♀, p. 312.

(1911) Pucrasia macrolopha macrolopha.

THE KOKLAS OR POKRAS PHEASANT.

Satyra macrolopha Lesson, Dict. Sci. Nat., lix, p. 156 (1827) (Almorah).
Pucrasia macrolopha. Blanf. & Oates, iv, p. 84 (part.).

Vernacular names. *Koklas*, *Kokla* (Simla to Almorah); *Pokras* (Kuman and Garhwal).



Fig. 40.—Head of *P. m. macrolopha*, ♂. ½.

Description.—Adult male. Crown chestnut-fawn; lateral tufts and whole head black glossed with green; a large patch of white on the sides of the neck; whole upper plumage silver-grey, a lanceolate streak down the centre of each feather velvety-black, the shafts on the lower back and rump paler; upper tail-coverts more chestnut, the longest almost entirely chestnut with grey tips and with longitudinal broken lines of black; central tail-feathers rufous, tipped grey, black-shafted, a well-defined black line and a second, less well-defined, running parallel with the shaft; wing-coverts like the back, the grey edges replaced by rufous-brown, shading into grey; quills brown with broad edges of buff, the innermost secondaries mottled and blotched with velvety-black; fore-neck to vent deep bright chestnut, varying considerably in depth and extent but generally covering the greater part of the

chest and abdomen; sides of the neck, breast and lower flanks grey, each feather with a central streak of black and those next the breast with the outer web chestnut; under tail-coverts tipped with white spots; vent pale chestnut, the feathers with black bases; thighs dull buff mottled with chestnut.

Colours of soft parts. Iris dark brown; bill horny-brown to black, less often plumbeous-horny or brown, tinged with greenish or purplish to fleshy or livid brown.

Measurements. Wing 215 to 244 mm.; tail 221 to 277 mm.; tarsus about 63 to 69 mm.; culmen about 24 to 29 mm.; crest up to 100 mm. and tufts up to 120 mm.; spur 10 to 19 mm.

Female. Crown chestnut or buff with broad black crescentic bars, decreasing on the short paler crest; buff or creamy supercilia, broad and ill-defined; upper parts pale brown with numerous fine broken bars of blackish, pale buff stripes and centres; the upper back and shorter tail-coverts richer in colour and more boldly marked than the rest; longest tail-coverts not blotched, but with pale edges and fine vermiculations of dark brown; central tail-feathers rufous buff, pale tipped with irregular bars of black centred with chestnut; outermost feathers chestnut with white tips, black subterminal bands, and black mottling on either web, intermediate feathers the same but with less black on each succeeding pair; chin and throat creamy-buff, with a line of black spots from the gonys; fore-neck and hind-neck buff with broad black or brown edges to each feather; remainder of lower plumage pale buff to creamy-rufous, with dark brown streaks, narrowest on the breast, broadest on the posterior flanks; vent and centre of abdomen whitish with brown spots; under tail-coverts chestnut with white spots.

Measurements. Wing 180 to 218 mm.; tail 172 to 195 mm.

Distribution. Kuman, Simla States, Garhwal and North to Lahul. Southern birds from Kashmir, Jamma, are nearest to this form. Probable boundaries between this and Marshall's *Pokras* are the Jhelum River in the North-West and the Chenab where it runs East and West.

Nidification. The Koklas Pheasant breeds during May, June and early July from 7,000 to over 12,000 feet. The nest consists merely of a slight collection of leaves and rubbish on the ground but it is always well concealed and is generally tucked away in dense green undergrowth. A favourite site is a rocky ravine or the broken sides of a steep hill, covered with Oak, Deodar or Blue Pine. The number of eggs laid varies from four to nine, most often five to seven. In ground-colour these vary from pale yellowish-stone to a deep warm pinky-buff. The markings consist either of sparse blotches or spots of chocolate-brown, brownish-purple or, in a few eggs, of innumerable tiny specks and blotches of the same scattered profusely over the whole egg. Sixty-eight eggs average 51·3×37·5 mm.: maxima **57·0**×38·1 and 51·9×**40·0** mm.; minima **49·0**×37·0 and 51·1×**34·5** mm.

This Pheasant is monogamous and the male assists in incubation.

Habits. The Koklas is the Pheasant *par excellence* for sportsmen in the North-West of India and bags of a dozen birds may still be made in a day's shoot. It is essentially a bird of the forests and may be found anywhere between 6,000 feet and the limit of forests, 12,000 to 14,000 feet. It prefers, however, forests which are for the most part open underneath on rocky broken ground with dense undergrowth in the ravines and pockets. Here it feeds mornings and evenings in the open on berries, acorns, seeds and all kinds of insects and retires during the heat of the day to the shady undergrowth. They are among the best of our Indian Game-birds for the table. The crow of the races is a very loud ringing "Kok-kok-kok—kokrass," from the last notes of which the bird takes its name.

(1912) Pucrasia macrolopha biddulphi.

THE KASHMIR KOKLAS.

Pucrasia biddulphi Marshall, Ibis, 1879, p. 481 (Kashmir).
Pucrasia macrolopha. Blanf. & Oates, iv, p. 84 (part.).

Vernacular names. *Plas* (Kashmir); *Kukrola* (Chamba).

Description.—Adult male. Differs from true *P. m. macrolopha* in being slightly darker above and in having the chestnut of the fore-neck extending to the hind-neck; below the chestnut is much darker and more mixed with black, whilst the feathers of the upper breast often have narrow edges of black.

Colours of soft parts as in the other races.

Measurements. Wing 233 to 249 mm.

Female. In this race the black markings on the outer tail-feathers are in bars and not in longitudinal streaks as in the preceding race.

Distribution. Northern Kashmir from Ladak to the extreme West.

Nidification. Similar to that of the Common Koklas. Ward records it breeding from 7,000 to 11,000 feet in ravines or among rocks on broken hill-sides in forest. Twenty eggs average 50·8×37·5 mm.: maxima **52·4**×37·0 and 50·6×38·6 mm.; minima **49·8×36·2** mm.

Habits. Those of the species.

(1913) Pucrasia macrolopha nipalensis.

THE NEPAL KOKLAS.

Pucrasia nipalensis Gould, P. Z. S., 1854, p. 100 (Nepal).
Pucrasia macrolopha. Blanf. & Oates, iv, p. 84 (part.).

Vernacular names. *Pocrass* (Nepal).

Description.—Adult male. Everywhere still darker than *P. m. biddulphi*; the black centres to the feathers occupy nearly the whole of both webs; the chestnut on the fore-neck forms a collar all round the neck extending on to the shoulders; on the breast and abdomen the black is also much greater in extent.

Measurements. Wing 208 to 228 mm.; tarsus about 66 mm.; culmen 23 to 26 mm.; crest 68 to 91 mm.

Female. Generally more rufous on neck and scapulars; tail-feathers, except the outermost, chestnut on the outer webs, blackish with white tips on the inner webs and with well-marked subterminal black bands.

Distribution. Western Nepal. Very little is known as to the exact localities whence skins were obtained or how far this Pheasant works East.

Nidification. Unknown.

Habits. Nothing recorded.

(1914) Pucrasia macrolopha castanea.

THE CHESTNUT-MANTLED KOKLAS.

Pucrasia castanea Gould, P. Z. S., 1854, p. 99 (Kafiristan).
Pucrasia macrolopha. Blanf. & Oates, iv, p. 84 (part.).

Vernacular names. None recorded.

Description.—Adult male. The chestnut on the hind-neck extends over the mantle; the rump is weakly marked with black and the chestnut of the fore-neck runs into the chin; nearly the whole of the breast and abdomen are chestnut, darker than in true *macrolopha* and more marked with black, especially on the flanks; the white on the breast and flanks is confined to narrow margins on a few feathers of the sides of the breast.

Measurements. Wing about 240 mm.; tail about 178 mm.; tarsus 43 mm.; spur about 10 mm.; culmen about 25 mm.; crest up to 104 mm.

Female. Unknown.

Distribution. The Mountain Ranges of Afghanistan, Kafiristan and Chitral, where they border on the North-West Frontier of India.

Nidification. Unknown.

Habits. Those of the genus. Fulton says that it is very common on the heavily-timbered mountain-side of Lower Chitral above 7,000 feet in Summer, coming lower in Winter. He adds that it is its call "Kok-kok-kok—kokras" that has led people to say the Jungle-Fowl occurs in these ranges. Though when uttered close by the sound is very different to that of the Jungle-Fowl's crow, it is not unlike in the far distance.

Genus CHRYSOLOPHUS.

Chrysolophus Gray, Ill. Ind. Zool., ii, pl. 41, fig. 2 (1833).
Type, *Phasianus pictus* Linn.

The genus *Chrysolophus* contains two species, the well-known Golden Pheasant and the Amherst Pheasant, the latter of which just comes into the extreme North-East of our area.

The distinguishing feature of the male is the curious cape-like arrangement of feathers rising from the neck and hanging over the neck and extreme upper back: there is also a true crest of hairy feathers.

The tail is composed of 18 feathers and is of very great length, the central pair being four times as long as the outermost; the wings are rounded, the first shortest and shorter than the tenth, and the fifth longest; the tarsi are long and stout and armed with short blunt spurs in the male.

(1915) Chrysolophus amherstiæ.

Phasianus amherstiæ Leadbeater, Trans. Linn. Soc., xvi, p. 129, pl. 15 (1828) (China).

Vernacular names. *Ja* (Tibet); *Sen-chi* (Chinese); ? *Wu-chree* (Burmese, Shan States).

Description.—Adult male. Occipital crest blood-crimson; truncate feathers from behind the nape and ear-coverts pure white with velvet-black edges, falling like a cape over the back and scapulars, the black glossed with blue and the longest feathers with a second bar of the same about 20 mm. from the tip; remainder of head, neck, throat, upper breast and mantle brilliant peacock-green, the feathers of breast and mantle sub-bordered with black and with tiny edges of scintillating emerald-green; lower back and rump brilliant golden-buff, each feather with a broad band of metallic dark blue-green and with a hidden black base; upper tail-coverts black and white, the central and some of the lateral with flame-coloured tips; the longest tail-coverts fall in pairs on either side of the true tail-feathers, making them look as if tasselled with orange-gold; central tail-feathers white with bars of metallic blue-black and irregular bars of dead black, more or less at right angles to those on the white interpaces; outer tail-feathers mottled black and white on the inner webs and with broken black edges next which the white is buffy-brown in tint; primaries brown, the outer edges white except for the terminal inch or so; outer secondaries brown, the first only edged with white; inner secondaries and coverts deep steel-blue, each feather edged with velvety-black; lower breast, abdomen and flanks white, the anterior flanks, thighs and vent barred and mottled with black; under tail-coverts deep blue-green, edged with black.

Colours of soft parts. "Iris clear yellow" (*Père David*); orbital skin blue; bill yellowish-horny, darker at base and round nostrils; legs and feet plumbeous or bluish-horny.

Measurements. Wing 205 to 233 mm.; tail 863 to 1143 mm.; culmen about 24 to 26 mm.; tarsus 76 to 86 mm.; spur a mere knob seldom exceeding 12·5 mm.

Female. Forehead and feathers over the eye rufous, more or less tipped black; feathers of crown, nape and sides of neck barred black and rufous, black glossed steel-blue, strongest on the hind-neck; whole upper plumage barred buff and dark brown; feathers of the mantle rufescent edged with mottled black and buff, the mottling extending to the bars of the rump, lower back and upper tail-coverts; primaries and outer secondaries brownish-black barred with rufous-black; inner secondaries and coverts like the back; chin and throat albescent, immaculate or nearly so; sides of throat, neck and breast chestnut-buff paling to creamy-buff on the flanks, with broad concealed bars of black; centre of breast and abdomen paler and with no bars; under tail-coverts barred dull rufous-buff and black.

Measurements. Wing 183 to 203 mm.; tail 309 to 373 mm.

Young males are like the female but acquire at the first moult a black-and-white barred throat and neck and a much more boldly marked breast and flanks; the forehead and crown become glossed with green and the white feathers of the cape begin to show.

Chick. Head fulvous, a dark line of chestnut running from the base of the bill, widening at the crown and covering the whole hind-neck; sides of head pale dull chestnut-buff with two tiny bars of black behind the ear-coverts; chin, throat and fore-neck dull, very pale buff; upper parts, wings and tail barred and freckled buff, chestnut and black; below dull pale buff with wide but indistinct bars of blackish.

Distribution. Mountains of Western China, Eastern and South-Eastern Tibet; Yunnan, Northern Shan States and the Kachin Hills in Upper Burma, where the Irrawaddy probably forms its Western limit. Three specimens have been obtained in the Myitkyina District.

Nidification. Two clutches of eggs in my collection taken by native collectors in Setchuan in May were said to have been laid on the ground on leaves under the shelter of a bush in dense forest. The eggs, four and seven respectively in number, are like small fowls' eggs, the four set a pearly-grey in colour, the seven set a light buff, both quite unspotted. They vary in size between 46·2 × 34·2 and 53·0 × 36·9 mm.

Habits. These beautiful Pheasants frequent forest in broken mountainous country between 7,000 and 12,000 feet and in many places are very common. Although very pugnacious they are soft birds with lax fluffy plumage taking little shot to bring them down, though they are such skulkers and so loth to fly that it is

difficult to get a shot without dogs. They are said by Bailey to be very noisy birds but he does not describe the call. They feed on all sorts of seeds, berries, roots and insects and according to Père David they prefer bamboo-shoots to anything else.

Genus LOPHURA.

Lophura Fleming, Philos. Zool., ii, p. 230 (1822).

Type, *Phasianus ignitus* Raff.

The genus *Lophura* contains three species of Pheasant which are in some respects rather closely allied to *Gennæus* but the tail, though compressed as in that group, is rather differently shaped; the naked portion of the face is produced above the forehead and as fleshy pendant wattles below the cheeks.

The wing is like that of *Gennæus*, the first primary equal to the ninth or tenth, the fifth and sixth subequal and longest; in both genera the tail is of sixteen feathers but in *Gennæus* the central tail-feathers are longest, whereas in *Lophura* the third pair are a little longer than the central pairs; the crest is composed of feathers with bare bases to the shafts and heavily-plumed tips; the tarsi are stout with well-developed spurs on those of the male. The genus is found in the Indo-Chinese countries from Yunnan through the Malay Peninsula to Sumatra and Borneo.

Key to Species.

A. Mantle deep purplish-blue. Males.
  a. Upper breast black; central tail-feathers white ..... *L. rufa*, p. 316.
  b. Upper breast grey; central tail-feathers black. *L. diardi*, p. 318.
B. Mantle chestnut. Females.
  c. Wing-coverts chestnut, vermiculated with black ..... *L. rufa*, p. 316.
  d. Wing-coverts black, with buff broken bars .. *L. diardi*, p. 318.

(1916) Lophura rufa.

VIEILLOT'S FIRE-BACK PHEASANT.

Phasianus rufus Raffles, Trans. Linn. Soc., xiii, p. 321 (1882) (Sumatra).
Lophura rufa. Blanf. & Oates, iv, p. 87.

Vernacular names. *Knock-wah*, *Kai-jah-phya* (Siam); *Mooah-Mooah* (Malay).

Description. Plumage above a deep rich metallic purple-violet; lower back a fiery golden-red, passing into rich copper-red on the rump, the concealed bases of these feathers like the upper back; two pairs of central tail-feathers white; inner webs of third pair white, outer webs of these and remaining tail-feathers black, glossed with violet; wing-quills brown, darker and almost black

on the innermost secondaries; greater and median coverts black, glossed with green; lower plumage purple-violet like the back, the sides of the lower breast and flanks with conspicuous white streaks, sometimes tinged with chestnut; centre of abdomen black; vent and thigh-coverts dingy blackish-brown; under tail-coverts black glossed with green.

Many birds, apparently fully adult, have a curious sprinkling of the finest specks of white arranged in a narrow line on each feather of the metallic black plumage and with similar terminal lines, but reddish, not white, on the primaries and secondaries.

Birds from Sumatra have the flank-streaks chestnut, not white.

Colours of soft parts. Iris bright pale red; facial skin smalt-blue; bill white to pale fleshy-horn; tarsus and toes bright vermilion-red, back of tarsus and sole paler; spur fleshy-pink or pale vermilion; skin of throat fleshy-pink (*Davison*).

Measurements. Wing 254 to 297 mm.; tail 228 to 325 mm.; tarsus 107 to 121 mm.; spur 31 to 43 mm.; culmen 32 to 36 mm. Weight 4¼ to 5 lb.

Female. Head, neck and upper back bright chestnut-rufous; lower back and remainder of upper plumage a paler buff-rufous, profusely covered with narrow irregular bars of black; the two colours grading into one another; tail and upper tail-coverts a rather richer chestnut than the head, narrowly barred with black except on the outer tail-feathers; wings like the back but more chestnut; chin and throat rufescent-white, changing into pale chestnut on the fore-neck; lower neck and breast bright chestnut, with broad white edges to the basal halves; remainder of lower plumage black with broad white edges to each feather and mixed with chestnut on the flanks; under tail-coverts black and chestnut; thighs black and chestnut fringed with white.

Colours of soft parts. Iris bright pale red; facial skin smalt-blue; bill horny-white, greenish-white or pale yellowish, the base and gape dark horny-brown; legs bright red or vermilion.

Measurements. Wing 223 to 264 mm.

Young males dull earthy-brown above, much freckled with rufous, head darker and an incipient crest tipped with chestnut; chin and throat albescent; neck, breast and flanks dark brown, the two latter with the feathers broadly edged white; centre of abdomen and vent dull white; under tail-coverts brown.

Distribution. South-Western Siam and the extreme South of Tenasserim to Sumatra.

Nidification. Two eggs from the Waterstradt collection are dated Malacca, 4. 4. 99, and are said to have been laid by wild birds "in a nest composed of dead leaves, grass and bamboo-spates under some thick low bushes in dense evergreen-jungle." An egg in the Hume collection laid in captivity is dated July. The three eggs measure 52·5×39·3, 50·9×39·1 and 57·1×39·6 mm. In colour they are a pale creamy-buff, quite unspotted.

Habits. This Fire-backed Pheasant is a bird of the dense low-country evergreen-forest, not being found in the higher hills anywhere throughout its habitat. They are said never to come into the open but feed in the forests on berries, shoots, seeds, insects and grubs, generally keeping in small coveys though the males sometimes live alone. They run well and though they make a great fluster in rising when once up have a strong and speedy flight. Davison says they have a note like the Black-backed Squirrel and another which he calls "chukan-chukan," whilst they also make a whirring sound with their wings, probably a challenge.

(1917) Lophura diardi.

THE SIAM FIRE-BACK.

Euplocamus diardi Bonap., Comp. Rend., xliii, p. 415 (1886) (Cochin China).

Vernacular names. *Kai-pha* (Siam); *Kai-jan* (Laos).

Description. Head black, the crest glossed with purple-blue and the fleshy-red skin showing through the feathers of the chin, throat and fore-neck; back and upper breast finely vermiculated grey and black; lower back the same but each feather with broad terminal bar of gold concealing the grey base; rump and shorter upper tail-coverts rich metallic blue-black fringed with deep copper-crimson; longest tail-coverts black, glossed with copper and fringed with metallic green; tail black glossed with blue, less noticeably on the inner webs; wings like the back but the scapulars with a broad subterminal band of black followed by a narrow line of pure white; lesser and median coverts with similar, but less pronounced bands; lower plumage black glossed with deep blue, the bases of the feathers brownish and showing through here and there.

Colours of soft parts. Iris burnt-sienna, light red to vermilion; bill pepper-brown; legs vermilion (*E. G. Herbert*). Facial skin bright scarlet-red.

Measurements. Wing 230 to 256 mm.; tail 345 to 386 mm.; tarsus about 100 mm.; culmen 30 to 34 mm.; crest 70 to 90 mm.

Female. Crown, nape and sides of head a dingy pale earth-brown shading into pale rufous-white on the chin, throat and fore-neck; neck, back and scapulars chestnut-red with faint dusky edges to each feather and some black stippling in tiny irregular bars; lower back, rump and upper tail-coverts vermiculated or mottled with pale rufous-buff and black, the bars broader and better defined on the back than elsewhere; four central tail-feathers the same with broad bars of black more boldly mottled with buff on their terminal halves; outer tail-feathers rich chestnut-red; visible portions of the wing like the central tail-feathers with the buff bars and mottlings still more boldly defined; primaries a lighter brown with narrow mottled buff bars; below

chestnut, the breast and fore-neck like the mantle; lower breast, abdomen and flanks with bold edgings of white to each feather; centre of abdomen dull brown and white; under tail-coverts chestnut, the bases mottled with brown.

Colours of soft parts. Iris raw umber, burnt sienna, Venetian red or Naples yellow; bill above black, the lower mandible yellowish horny; feet and legs a vermilion, duller than in the male (*Herbert*).

Measurements. Wing 220 to 238 mm.

Young male like the female but duller and more mottled with blackish above; the breast is more brown, less chestnut, and the white edgings to the breast and flanks are obsolete or wanting. The full adult plumage seems to be obtained at the first autumn moult.

Distribution. Siam, Annam and Cambodia, Shan States and Eastern Laos country. I have also had it reported from Karenni.

Nidification. A clutch of eggs was taken by one of Herbert's collectors near Muok-lek in Eastern Siam on the 19th of April and on the 2nd of May two other eggs were taken. The first nest was situated on the ground in a hollow tree, both male and female being trapped on the nest. Two eggs of the first clutch were unfertile, these and the two taken in May are pale buff in colour, broad ovals in shape and measure 47·5×37·1, 47·7×36·3, 47·0×38·0, and 46·9×38·1 mm.

Habits. Very little on record. It seems to haunt much the same kind of country as Vieillot's Fire-back, dense forest with thick green undergrowth. These birds are constantly trapped by the Siamese, who prize them as cage-birds and in captivity they are hardy and will breed. They feed on all kinds of fruit, berries and insects, worms, snail land-crabs etc. Their flesh is said to be good-eating but rather dry.

Genus **GENNÆUS.**

Gennæus Wagler, Isis, 1832, p. 1228.

Type, *Phasianus nycthemerus* Linn.

This genus contains the Pheasants popularly known as Kalij and Silver Pheasants and are the most closely-allied of all our Indian Pheasants to the Jungle-Fowl. They are all heavily built, powerful birds with comparatively short rounded wings; tail of sixteen feathers, compressed, and of great or moderate length with the central tail-feathers longest; their legs are stout and fairly long, armed in the male with powerful spurs, one on each leg and only abnormally two; there is a well-developed crest and a vividly-coloured bare space round the eye.

It is possible that the whole of these Pheasants should be treated as races of one species, *nycthemerus* of Linnæus. We have, however, certain main definite forms which are constant over great

areas and for the present therefore I retain the same number of species as I admitted in my Catalogue of Birds. At the same time our material for comparison, especially in regard to the Silver Pheasants of Burma and further East, is very meagre and our field-notes not very satisfactory, so that it is quite possible that when these faults are remedied we may have either to admit more races or, on the other hand, relegate to the scrap-heap of synonyms some of those now admitted.

Key to Species.

A. Lower plumage black or black and white.	
a. Crest white or very pale brown	*G. hamiltonii*, ♂, p. 320.
b. Crest black.	
a'. Upper plumage black, feathers with pale edges and rump barred white; breast largely whitish	*G. leucomelanus*, ♂, [p. 322.
b'. Upper plumage wholly black; breast whitish	*G. melanotus*, ♂, p. 323.
c'. Upper plumage black, rump boldly barred with white; breast black ..	*G. horsfieldii*, ♂, p. 324.
d. Upper plumage grey, formed by narrow vermiculations and bars of black and white	*G. lineatus*, ♂, p. 327.
e'. Upper plumage almost white, with sparse narrow bars of black	*G. nycthemerus*, ♂, p. 331.
B. Lower plumage mottled or squamated and with pale shafts but not with white or buff streaks.	
c. Rather paler below	*G. hamiltonii*, ♀, p. 320.
d. Rather darker below.	
f'. Central tail-feathers well mottled.	
*a*². Feathers of upper plumage with pale contrasting edges	*G. leucomelanus*, ♀, [p. 322.
*b*². Feathers of upper plumage with pale edges, barely showing	*G. melanotus*, ♀, p. 323.
g'. Central tail-feathers not much mottled	*G. horsfieldii*, ♀, p. 324.
C. Lower plumage with white or buff streaks not squamated	*G. lineatus*, ♀, p. 327.
D. Lower plumage with white or buffy-white centres, or buff with bold bars or edges of dark brown	*G. nycthemerus*, ♀, p. 331.

(1918) Gennæus hamiltonii.

THE WHITE-CRESTED KALIJ.

Phasianus hamiltonii Griff., ed. Cuv. Anim. King., Aves, iii, p. 27 (1829) (Simla).
Gennæus albocristatus. Blanf. & Oates, iv, p. 89.

Vernacular names. *Kalij, Kukera, Mirghi Kalij, Kalesur* ♂, *Kalesi* ♀ (Hin. in N.W. India); *Kolsa* (W. Punjab and Chamba).

Description.—Adult male. Long hairy crest white or dirty pale brown; remainder of head black, glossed with purplish-blue;

upper back black glossed blue and with the feathers edged whitish or pale brown and with white shafts; lower back, rump and upper tail-coverts black, glossed steel-blue broadly edged white and sometimes subedged brownish; tail-feathers glossy black above, below browner with pale tips; lesser and median wing-coverts like the back; greater coverts with a greener gloss and dark shafts; quills dark brown glossed on the visible parts with green; chin, throat and fore-neck dark brown with pale shafts, gradually changing to grey with a pale steel-blue sheen on the lower fore-neck, thence into white, more or less tinged with brown on the lanceolate feathers of the breast and flanks; abdomen, vent and under tail-coverts dull brown, more or less edged paler.

Colours of soft parts. Iris brown or orange-brown; bill greenish-white, dusky at the tip; orbital skin vermilion to crimson with slight black feathering; legs and feet livid white to pale olive-brown or slaty-brown.

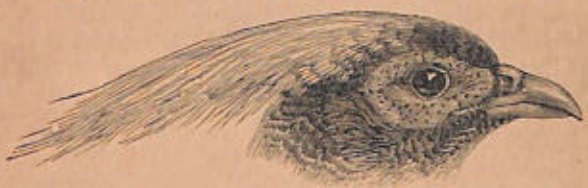


Fig. 41.—Head of *G. hamiltonii*, ♂. ½.

Measurements. Wing 216 to 249 mm.; tail 228 to 327 mm.; tarsus about 75 to 80 mm.; culmen about 23 to 26 mm.; tarsus 75 to 105 mm. Weight 2 lb. to 2 lb. 6 oz.

Female. Head reddish-brown with pale shafts; whole upper plumage reddish-brown, each feather distinctly pale-shafted and with pale edges; quills brown, the inner secondaries with rather pale shafts; back and wings finely vermiculated with black; central tail-feathers reddish-brown, vermiculated brown on both webs and with a few buff or white markings on the edge of the outer webs; remaining tail-feathers dark brown, glossed with green and often with pale tips; lower plumage like the upper but paler and with broader pale margins to the feathers; chin and throat paler still; centre of abdomen and vent pale dull brown.

Measurements. Wing 203 to 215 mm. Weight 1 lb. 4 oz. to 2 lb. 4 oz.

Chick in first plumage. Crown chocolate-brown; sides of head and crown more rufous; ear-coverts dark brown; upper plumage brown minutely freckled with black, each feather edged paler, a white spot at the tip and a broad subterminal bar of black edged rufous; lower plumage dull pale brown, the feathers with whitish shafts and pale edges.

Distribution. The Himálayas from the Indus on the West to Nepal as far as the Gogra on the East. Reports of its occurrence in Bunir and Swat have not been confirmed.

Nidification. The White-crested Kalij breeds from the foot-hills up to 10,000 feet. From 1,200 to about 5,000 feet it lays from the end of March to the end of June but above this does not commence to breed until May. The nest is just the débris on the ground, sometimes raked into a hollow, natural or scratched out by the birds themselves, hidden away under some bush, rock or rank tuft of grass in thick undergrowth of fir, oak or other forest. Occasionally it is said to make a better bed or nest for its eggs, collecting grass etc. for the purpose. They lay from six to nine eggs, rarely up to fourteen, which in appearance are just like fowls' eggs. In colour they range from pure white, which is exceptional, to a deep warm buff. One hundred eggs measured by myself average 49·5 × 37·0 mm.: maxima **53·1** × 39·1 and 50·8 × **40·0** mm.; minima **44·1** × 36·3 and 48·2 × **34·3** mm. Hume gives the breadth of one egg as 31·7 mm.

The cock bird probably does not deserve his reputation for polygamy and seems to keep to one wife, whom he assists with the young when hatched. The hen sits very close and will sometimes allow herself to be caught before she will move.

Habits. This Pheasant is a resident bird like all others of the genus, though it may desert the higher hills in Winter. It is a bird of forest and dense cover but less exclusively restricted to humid evergreen-forests than some of its relations whilst it sometimes wanders into comparatively open spaces to feed, especially in the mornings and evenings. It is not gregarious but keeps in pairs or family-parties, feeding on seeds, berries, grain, insects, worms etc. as well as on buds and shoots. The call of the cock is described as a loud whistling chuckle or cluck. They are excellent game-birds, both because of the sport they afford and the good dish they form when shot.

(1919) Gennæus leucomelanus.

THE NEPAL KALIJ PHEASANT.

Phasianus leucomelanus Lath., Ind. Orn., ii, p. 633 (1790) (India, Nepal).
Gennæus leucomelanus. Blanf. & Oates, iv, p. 90.

Vernacular names. *Kalick Kalij* (Parbuttia); *Rechabo* (Bhutia, Nepal).

Description. Similar to *G. hamiltonii* but with the crest glossy blue-black; the feathers of the lower back, rump and upper tail-coverts glossy blue-black with narrow white edges and vermiculated brown sub-edges; the wing-coverts have more white than on the preceding bird; chin and fore-neck more dark and glossy and the underparts on the whole more albescent.

Colours of soft parts as in the preceding species.

Measurements. Wing 204 to 233 mm.; tail 249 to 305 mm.; tarsus about 75 to 80 mm. Weight 1 lb. 12 oz. to 2 lb. 8 oz.

Female differs from the White-crested Kalij in being more red and richly coloured; the feathers of the underparts have dark centres not seen in that species.

Chick in down. Head chestnut, paler on the forehead and behind the eye; a dark streak from the eye down the neck; centre of back chocolate-brown with broad lateral bands of pale buff; sides dull chestnut; chin and throat pale yellowish-white, remainder of lower parts pale yellowish-grey.

Distribution. Nepal, as far East as the Arun River. I procured several specimens from Dhamkhata on the Tamra, which runs into the Arun. Nepalese traders at Pankabari and Jalpaiguri bring down this species for sale.

Nidification. The only eggs known of this species are a pair of eggs and a clutch of five obtained by Mr. Ferry from the Nepalese in the hills immediately above Bettiah. They were taken on the 25th June and 23rd May and are just like the eggs of *G. hamiltonii* but are very deep pink-buff in colour. They measure from 46·1×27·7 to 53·0×39·0 mm.

Habits. Similar to those of the preceding bird and apparently ascending the hills as high as 9,000 ft. The Nepalese who brought in the two clutches of eggs above referred to said they were very common and that they trapped many birds of *both sexes* on the eggs, taking both birds and eggs for food. They only get them in forest and most often close to streams.

Scully records this Pheasant roosting in flocks, out of which he sometimes shot four or five birds.

(1920) Gennæus melanotus.

THE BLACK-BACKED KALIJ PHEASANT.

Euplocamus melanotus (Blyth) Hutton, J. A. S. B., xvii, p. 694 (1848) (Darjeeling).
Gennæus melanonotus. Blanf. & Oates, iv, p. 91.

Vernacular names. *Kar-Rhyak* (Lepcha).

Description.—Adult male. Whole upper plumage black, glossed with deep violet-blue, green in some lights and purple in others, each feather edged with velvety unglossed black; all the feathers have white shafts, conspicuous on the scapulars and upper back but concealed elsewhere; wing-quills brown, the inner secondaries glossed with blue-green or green; chin and throat blackish-brown, paling towards the breast; the long lanceolate feathers of the breast white with brown bases, the white decreasing in extent towards the abdomen and flanks; centre of abdomen and vent brown; under tail-coverts and thighs blackish-brown.

Some males have narrow white edges to some of the scapulars and inter-scapulars; the extent of white on the lower plumage also varies much.

Colours of soft parts. Iris hazel-brown to orange-brown; facial skin bright red to crimson; bill yellowish or greenish-horny, blacker at the base, paler at the tip; legs and feet horny, slaty or greenish-brown, soles paler.

Measurements. Wing 216 to 241 mm.; tail 238 to 312 mm.; tarsus 78 to 83 mm.; culmen 28 to 32 mm.; crest up to 76 mm. Weight 2 lb. 6 oz. to 2 lb. 12 oz.

Female. Only differs from the *female* of *G. leucomelanus* in having the nape a less bright chestnut than the crest and upper back; it has the tail-feathers more chestnut than in *G. albocristatus* and is perhaps rather darker than that bird.

Measurements. Wing 195 to 223 mm. Weight 1 lb. 14 oz. to 2 lb. 4 oz.

Distribution. Sikkim, West into Nepal, probably to the Arun River, East to Bhutan.

Nidification. This Pheasant breeds freely in Sikkim from 2,000 to 8,000 feet and is common round many of the Tea Estates, breeding actually among the Tea-bushes or in the scrub and forest adjoining. The eggs number six to ten and are of the usual character. Hume gives the average of "a large series" as 48·5×36·3 mm.

The breeding-season lasts from the end of April to early June, birds below 2,000 feet breeding a month earlier than this, those above 5,000 feet a month later.

Habits. Similar to those of the other species. Stevens says that in common with other Kalij Pheasants this bird prefers jungle in close proximity to running water.

Gennæus horsfieldii.

Key to Subspecies.

A. Back and scapulars unmarked ..... *G. h. horsfieldii*, p. 324.
B. Back and scapulars finely barred with black and white ..... *G. h. williamsi*, p. 326.

(1921) Gennæus horsfieldii horsfieldii.

THE BLACK-BREASTED KALIJ PHEASANT.

Gallophasis horsfieldii Gray, Gen. B., iii, p. 498, pl. cxxvi (1848) (India, *Assam*).
Gennæus horsfieldii. Blanf. & Oates, iv, p. 92 (part.).

Vernacular names. *Mathura* (Chittagong, Tippera, Goalpara); *Modura* (Sylhet and Cachar Plains); *Deorik*, *Dirrik*, *Durug* (Garo Hills); *Deodip* (Cachari); *Vohtep* (Kuhi); *Inruitip* (Naga); *Yit* (Burma).



GENNAEUS H. HORSFIELDI (GRAY).
♂ The Black-breasted Kalij Pheasant ♀

Description.—Adult male. Whole plumage except the rump, lower back and upper tail-coverts black; above, the plumage is glossed with purple-blue, in some specimens more blue, in others more purple; below, in fresh moult the gloss is more purple but soon wears away so that most birds are dull black; the primaries are unglossed blackish-brown; lower back, rump and upper tail-coverts black with broad terminal bars of white.

Some individuals have traces of white edging to a few feathers on the back and wing-coverts and fewer still have a few white streaks on the sides of the breast.

Colours of soft parts. Iris dark brown to red-brown; bare skin of face crimson; bill light greenish or yellowish-horny, the culmen and base darker; legs some shade of plumbeous or brown, very rarely with a red or pink tinge and this never strong.

Measurements. Wing 211 to 241 mm.; tail 210 to 245 mm.; tarsus about 76 to 84 mm.; culmen 28 to 32 mm.; crest about 76 mm. and up to 90 mm. Weight 2¼ to 3¾ lb.

Female. Above reddish-brown finely powdered with dark brown, the feathers, except of the head, edged and shafted paler; the central pairs of tail-feathers chestnut-brown, more or less vermiculated with dark brown; other feathers blackish-brown, those next the central ones marked with chestnut-brown; upper tail-coverts and rump a little paler than the back; wing-coverts rather more broadly pale-edged; quills reddish-brown, the innermost secondaries finely vermiculated with dark brown and sometimes tipped and edged paler; chin and throat white, grading into brown on the fore-neck and remainder of the plumage which has white shafts to the feathers; centre of abdomen and vent dingy-brown; under tail-coverts blackish-brown with narrow pale edges.

Measurements. Wing 203 to 228 mm.; tail 190 to 228 mm.

Young males are like the females but generally darker with white or pale buff edgings more in contrast with the rest of the feather.

Cocks take two or even three moults before acquiring the full plumage.

Chick in down. Head chestnut with black coronal streak; a dark chestnut streak from the eye, below which the buff is paler; median body-stripe rich chestnut-brown; sides and underparts of body ashy or ashy-buff with an ill-defined chestnut band on the breast.

Distribution. East of Bhutan, all Assam, East to the Irrawaddy; Arrakan as far South as Akyab, and down some of the humid, densely-forested streams of the Chin Hills, where generally it is replaced by the next race.

Nidification. In Assam this Kalij breeds principally from the middle of March to the middle of June but I have seen eggs in every month of the year from February to October and many birds must have two broods. They breed over a great part of the

plains and commonly up to 2,500 feet, less often up to 5,000 but keep to very dense cover, either forest, scrub- or, occasionally, bamboo-jungle. There is no real nest but a pile of débris under thick bushes is selected and the eggs, four to ten in number, are deposited in a shallow cup scratched in this. They are well hidden but if the searcher is very quiet the hen sits so close that she will not rise until almost touched and then flounders off and gives away the nest. When the clutch is incomplete she is more shy and sneaks away as soon as she hears any one approaching. The eggs are of the usual type and two hundred average 47·3×36·3 mm.: maxima **54·0**×35·1 and 53·0×**39·9** mm.; minima **43·1**×34·7 and 45·0×**33·1** mm. Pigmy eggs are very common.

This Pheasant is not polygamous but the cock bird remains near the hen when she is sitting, sometimes helps in the incubation himself and assists in feeding the chicks. The display of the cock is like that of the Jungle-Fowl.

Habits. This is a forest and jungle Pheasant but it prefers dense forest close to cultivation, natural openings or streams, where it can come out and feed in the mornings and evenings. Water seems a necessity and birds will rarely be found far from it. They keep in family-parties except in the breeding-season and two or more of these often join forces, especially when feeding in mustard-fields or other cultivation. They are very pugnacious and occasionally may be caught, utterly exhausted, after a fight; at the same time they are not nearly such fine fighters as Jungle-Fowl and seldom fight to the death. The call is a harsh single crow, always uttered, I think, from some branch or other elevated perch.

(1922) Gennæus horsfieldii williamsi.

WILLIAMS'S KALIJ PHEASANT.

Gennæus williamsi Oates, Man. Game-B., i, p. 342 (1898) (Kalewa, Upper Chindwin).

Vernacular names. *Yit* (Burmese); *Rak* (Arrakan).

Description.—Adult male. Crest black; head, neck, back and whole visible portions of wing grey, this effect in colour being formed by numerous tiny bars of white, or buffy-white, and black: lower back, rump and upper tail-coverts black with numerous bars of white and broad white fringes to the feathers, making these parts contrast with the back and to appear much whiter and more boldly barred; tail like the back but more boldly marked with white; inner webs of primaries brown, obsoletely mottled with darker brown; lower plumage like *G. h. horsfieldii*.

The general tone varies greatly. Individuals merging into *horsfieldii* on the North-Eastern border of their habitat are very dark, the black predominating over the white; on the other hand, individuals on the Southern and Western boundaries are pale, grading into *G. l. oatesi* and *G. n. rufipes* respectively.

Colours of soft parts. Iris brown; facial skin deep crimson-red; bill pale horny, the tip almost white; legs and feet various shades of dark and light plumbeous-brown, ashy-brown or fleshy-livid, never red.

Measurements. Wing 218 to 254 mm.; tail 218 to 304 mm.; tarsus about 72 to 77 mm.; spur up to 26 mm.; culmen 28 to 32 mm.

Female is distinguishable by its tail from *G. h. hörsfieldii*; the central tail-feathers are paler and more chestnut; the lateral feathers are black or nearly black with numerous narrow broken bars of white. On the whole, the females of this race are paler and more chestnut than those of the preceding.

Wing 195 to 231 mm.

Distribution. Confined to the moderately high hills lying between the Manipur, Oyu and Irrawaddy rivers; South it is found in the Arakan Yomas and on the East as far as Minbu and Thayetmyo. North it occurs as far as Homalin and Tammu.

Nidification. William's Kalij breeds between 2,000 and 4,000 and rarely up to 6,000 feet (Fort White), principally from early April to the end of May, possibly both earlier and later. The eggs number four to nine and are similar to those of other Kalij Pheasants, though the few I have seen are rather pale buff. Sixteen eggs average 45·5×35·8 mm. They appear to breed more in scrub-jungle, secondary growth and thin deciduous forest with some undergrowth, rather than in deep evergreen-forest.

Habits. Similar to those of the Black-breasted Kalij but it is not so much a bird of the deep shadowy forests as of the scrub-jungle and secondary growth. Its note is the same single crow as that bird utters and it has in common with all other species of *Gennæus* the guttural "Whoop-keet-keet," rapidly repeated as they feed and move about, the same cry rising more loudly if alarmed or fighting.

Gennæus lineatus.

Key to Subspecies.

A. Vermiculations very fine and all across the feather ..... *G. l. lineatus*, ♂, p. 328.

B. Vermiculations more definite bars across the feather ..... *G. l. oatesi*, ♂, p. 329.

C. No vermiculations but definite black-and-white bars, inclining to follow the contour of the feather ..... *G. l. sharpei*, ♂, p. 330.

D. Central streaks on lower plumage buff and confined to breast and flanks ..... *G. l. oatesi*, ♀, p. 329.

E. Central streaks white and numerous everywhere; lower plumage bright rufous.... *G. l. lineatus*, ♀, p. 328.

F. Central streaks white and broader; lower plumage darker and less rufous ..... *G. l. sharpei*, ♀, p. 330.

(1923) Gennæus lineatus lineatus.

THE BURMESE SILVER PHEASANT.

Phasianus lineatus Vigors, P. Z. S., 1831, p. 24 (Straits of Malacca).
Gennæus lineatus. Blanf. & Oates, iv, p. 92.

Vernacular names. *Yit*, *Kayit* (Burma); *Rak* (Arrakan); *Pynklouk* (Talain); *Phugyk* (Karen).

Description.—Adult male. Forehead, crown and crest black glossed with blue-green or purple-blue; whole of the upper plumage and exposed wings silver-grey in appearance, palest on the neck and longest tail-coverts, darkest on the wing-quills and greater coverts; the silver-grey tint is formed by innumerable very fine wavy lines of white and black; the primaries are brown with wavy lines of buff or pale brown on both webs, the lines gradually changing into black and white on the inner secondaries; outer tail-feathers black with fine longitudinal lines of white or pale buff; each succeeding pair has more white and less black until the central pair, or two pairs, are more or less immaculate white over their terminal two-thirds; below black, the neck, breast and flanks more or less glossed with bluish-purple and the sides having white centres to the feathers; the flanks often vermiculated velvety-black.

Colours of soft parts. Iris yellow-brown to dark brown; facial bare skin crimson; bill greenish or yellowish-horny, darker at the base and on the culmen; legs and feet greenish-plumbeous, slate-grey or greenish-brown.

Measurements. Wing 218 to 261 mm.; tail 228 to 345 mm.; tarsus about 76 to 88 mm.; culmen about 28 to 30 mm.; crest up to 80 mm.

Female. Whole upper plumage golden-buff vermiculated with tiny bars of black or deep brown, giving a general golden-brown appearance, sometimes tinged with rufous; crest rather darker than elsewhere; neck and upper back with V-shaped marks white bordered with black; primaries and outer secondaries dark brown on the inner webs; two pairs of central tail-feathers buff with narrow bars of black running diagonally across but often absent on the terminal half of the central pair on the inner webs; outer tail-feathers rich chestnut with broad irregular bars of white, bordered, and sometimes spotted, with black; the feathers next the central pair are mottled with buff near the tips, this mottling decreasing outwardly; chin and throat smoky-buff changing to rich pale rufous on the breast and flanks, where there are lanceolate streaks of white edged with black and with more or less black and rufous mottlings next the shafts; abdomen and vent dull rufous-buff with a little white mottling; under tail-coverts dark rich rufous with white, black-edged streaks.

Colours of soft parts. Iris amber to wood-brown; facial skin dull crimson; bill and legs as in the male.



GENNAEUS L. LINEATUS (VIGORS).
♀ The Burmese Silver-Pheasant. ♂

Measurements. Wing 293 to 234 mm.

Chick in down. Head above rufous, forehead and above eyes paler; a rich chestnut line from the eye over the ear-coverts; above rufous-brown, darkest along the back, paler on the sides; below dull buffy-white with faint indications of a chestnut collar on the sides of the breast.

Distribution. Extreme South and East of the Arrakan Yomas; North to Thoungyi or about up to 20° West of the Sittang River but only as far as Thaungoo and Kolidoo on the East of that river and that only in the lower hills near the river. South it crosses the Sittang and has been recorded from Yoh as far South as 12°, though it is not certain that this is the same subspecies. It, however, occurs in South-West Peninsular Siam and in Tenasserim South of Tavoy. In the North it apparently passes through the lower valleys past Fort Stedman as far East as Kongtong, whence I have seen quite typical specimens.

Nidification. This Silver Pheasant breeds from early March to the end of April so far as is known at present, laying six to eight eggs in slight hollows scraped in fallen débris. Most generally the site selected is one in bamboo-jungle, either of the clump or single growing variety, or less often in scrub-jungle. No one yet seems to have obtained its nest in deep green forest and it is probably only a casual visitor to country of that character. In colour the eggs vary from a very pale buff to a deep buff-brown and in shape and texture are like those of other birds of this genus. Thirty eggs average 47·7×36·9 mm.: maxima **50·2**×36·7 and 48·2×**38·2** mm.; minima **44·1**×35·9 and 47·1×**35·5** mm. They are not polygamous in a natural state and apparently less pugnacious than most of their tribe.

Habits. This Pheasant frequents bamboo-jungle in preference to all others but is also found in scrub, secondary growth and in thin deciduous forest with a little undergrowth. Like all its kin it is a shy retiring bird, running rather than flying, though flying well when forced to do so. It is a Pheasant of the middle elevations between 2,000 and 4,000 feet but is found down to the foot-hills and up to 6,000 feet, haunting rocky and broken ground, ravines etc. rather than the more rolling hills. Like all other birds of this genus the males have the power of puffing out or inflating their wattles and this is invariably done during courting displays or when angered, the inflation of the wattles being generally accompanied by the usual low guttural conversational notes, more loudly repeated. It feeds in the open in the mornings and evenings, keeping under cover during the hotter hours.

(1924) Gennæus lineatus oatesi.

OATES'S SILVER PHEASANT.

Gennæus oatesi Ogilvie-Grant, Cat. B. M., xxii, p. 306 (1893) (Prome).

Vernacular names. *Vit* (Burma); *Rak* (Arrakan).

Description.—Adult male. Similar to *G. l. lineatus* but more boldly marked with better-defined vermiculations; the larger and more conspicuous barring of the rump, as in the *horsfieldii* group, is visible but very inconspicuous, often obsolete; the markings are in the shape of bars across the feather and not following its contour as in the *nycthemerus* group.

Colours of soft parts as in *G. l. lineatus*.

Measurements. Wing 233 to 294 mm.; tail 275 to 300 mm.

Female differs from that of *horsfieldii* in having the whole tail chestnut-brown or chestnut-rufous barred irregularly both above and below with brown; the general tone of the plumage is redder and the streak on the upper surface obsolete or ill-defined; the flanks and sides of the breast are marked with streaks as in the Burmese Silver Pheasant but these are buff not white.

Measurements. Wing about 205 mm.; tail about 210 mm.

Distribution. Arrakan Yomas from about 20°·5 lat. on the North to the extreme South. Its Eastern boundary seems to be the Irrawaddy River.

Nidification much the same as that of *G. l. lineatus* but very little is known about it. Most eggs seem to be laid between the 20th March and 10th May, the nesting-sites selected being invariably either in rather thick bamboo-jungle or in the dense secondary growth which comes up in deserted cultivation. The eggs are inseparable from those of the other races and ten of them average 47·0×37·1 mm. Fielden found young birds just hatched in August.

Habits. This Pheasant is found from the level of the plains up to some 3,000 feet but is not a bird of high latitudes. It haunts bamboo-jungle, scrub- or grass-covered hill-sides which are steep and broken, so that even where common it is not easy to make a bag.

(1925) Gennæus lineatus sharpei.

GRANT'S SILVER PHEASANT.

Gennæus sharpei Oates, Man. Game-B., p. 357 (1898) (Salween).

Vernacular names. *Yit* (Burma).

Description.—Adult male. Differs from the preceding bird in having the upper plumage marked with definite black-and-white bars rather than vermiculations, whilst these bars follow to some extent the contour of the feathers instead of being across the feathers; from all the races placed under the name of *nycthemerus* it differs in having much more black and much less white.

Colours of soft parts. Iris brown; facial skin deep crimson; bill pale bluish-horny; legs and feet pinkish flesh-colour to reddish-horny.

Measurements. Wing 249 to 251 mm.; tail 348 to 353 mm.; tarsus about 86 mm.; culmen about 35 mm. Weight 2·75 lb.

Female. Similar to the female of *G. l. lineatus* but darker, less rufous below, with still broader streaks of white on the lower plumage.

Measurements. Wing 213 to 243 mm.

Distribution. South Shan States, East Central Burma and Siam. With the material available it is impossible to define the limits of the various species and subspecies of *Gennæus* with any accuracy. All seem to wander greatly and all depend much on elevation and type of forest or jungle for their habitat and where high ranges of mountains run far into country of otherwise low hill, or where deep wide valleys intersect high mountainous country, the habitats of the several groups appear, on the map at least, to overlap in the most intricate way.

An immense amount of work still remains to be done by our field-collectors and much more material must be collected before we can properly understand this remarkable group of Pheasants. Moreover, every individual skin collected must have as much data given with it as is possible, and, finally, every bird collected during the breeding-season is, however brutal it may appear to be to say so, worth ten collected in the non-breeding season.

Nidification. Nothing on record but in the Herbert collection there are three eggs taken by Gairdner at Ratburi, Western Siam, on the 3rd of April. The three eggs measure 45·8×35·8, 45·0×35·3 and 45·2×35·1 mm. In colour they are a warm buff.

Habits. Nothing recorded but probably differing in no way from *G. l. lineatus* except in frequenting higher hills between 2,500 and 5,000 feet, especially those which have a certain amount of grass-lands on their higher slopes.

Gennæus nycthemerus.

Gennæus nycthemerus Linn., Syst. Nat., 10th ed., p. 159 (1758).

Type-locality: China.

The typical form differs from either of those found within our limits in having the black bars reduced to a minimum, so that the general appearance above is much more white.

(1926) Gennæus nycthemerus ripponi.

THE YUNNAN SILVER PHEASANT.

Gennæus ripponi Sharpe, Bull. B. O. C., xiii, p. 29 (1902) (S. Shan States).

Vernacular names. *Vit* (Burma); *Wuri* (Kachin).

Description.—Adult male. Forehead, crown and crest black with a strong purple sheen; nape to tale-coverts white with from

five to seven wavy lines of black on each web following the outline of the feather, the lines are narrower on the nape and obsolete on the ear-coverts and sides of the neck; visible portions of the wing like the back but only two to four black lines on each web of the feathers, broader than the lines on the back; two or three central pairs of tail-feathers white with a few irregular broken lines of black on the bases of the outer webs; outermost feathers white with two or three bold black lines on either web; intermediate feathers grading from one to another; below deep velvety-black with a purple-blue gloss.

Colours of soft parts. Iris brown or red-brown; bill greenish or yellowish-horny, the culmen and base darker; bare facial skin bright crimson-red to almost vermilion-red; legs brilliant coral-red.

Measurements. Wing 256 to 302 mm.; tail 458 to 635 mm.; tarsus 95 to 103 mm.; culmen about 29 to 31 mm.; crest 75 to 101 mm.; spur 25 to 33 mm.

Female. Whole upper plumage golden-brown, the edges of each feather darker and the whole microscopically powdered with dark brown; terminal half of crest black; two central pairs of tail-feathers pale ashy-buff marked with fine broken bars of dark brown; lateral tail-feathers black with straggling broken lines of white; chin and upper throat pale ashy, changing to ashy-brown on the lower throat and upper breast, the latter paler and much mottled with brown spots and bars; lower breast still paler and more boldly marked; remainder of lower plumage rather dingy white with bold broad bars of dark brown; centre of abdomen and vent duller with much finer bars of brown.

Measurements. Wing about 200 to 240.

Young birds in first plumage have the whole lower parts more uniform buffy-brown with paler shaft-streaks.

Young males in second plumage appear to be exactly like adult females, but occasionally they moult direct into full adult plumage. A most interesting incident in the moulting of some cock birds in the possession of Mr. E. G. Herbert shows that many of the old feathers prior to being shed assumed a certain amount of black-and-white colouring, proving conclusively that in some cases so-called "dead feathers" are capable of absorbing pigment.

Distribution. Inter-Salwin country from latitudes 21° to 25° certainly, possibly further North and probably further South. Where this bird meets the last is not definitely known but it may be on a line running East and West from Kareuni to Doi-par-Sahem. It is extremely common in parts of Yunnan at about 7,000 to 9,000 feet.

Nidification. Nothing known.

Habits. Although this grand Pheasant is sometimes found in forest, it is more usually to be met with in the thin scattered oak-forest of about 7,000 feet upwards where patches of forest



GENNAEUS N. RUFIPES.
♂ The Ruby-Mines Silver Pheasant. ♀

alternate with wide stretches of upland, covered with grass a foot to three feet high and dotted here and there with stunted oaks. In these sunlit bleached grass-expanses the dazzling white of the Pheasant's back, broken by the black streaks, is not only inconspicuous but is very hard to make out. It is, like all the genus, a great skulker and runner, and once on the wing is, naturally, a most conspicuous object as well as a noisy one. Its crow is that of the genus, a harsh deep note not unlike that of *Phasianus* but more guttural. They are said often to collect in small coveys of six to eight birds composed entirely of cocks.

(1927) Gennæus nycthemerus rufipes.

THE RUBY MINES SILVER PHEASANT.

Gennæus rufipes Oates, Man. Game-B., i, p. 362 (1898).

Vernacular names. *Yit* (Burma); *Wuri* (Kachin).

Description.—Adult male. Similar to the preceding race but darker, the black lines and bars broader and more numerous, especially on the tail; the sides of the neck are less white and are vermiculated with tiny narrow bars of black; the tail is on an average much shorter than in *S. n. ripponi*.

Colours of soft parts as in the Yunnan Silver Pheasant.

Measurements. Wing 246 to 279 mm.; tail 406 to 528 mm.

Female. General colour above rich olive-brown, crest darker; tail richly mottled and barred with deep chestnut and blackish-brown, the outermost tail-feathers darkest; underparts rufous-brown to rich blackish-brown, the feathers marked with bold concentric bars of fulvous, these bars following the contour of the feathers and not in straight streaks as in the Burmese Silver Pheasant.

Measurements. Wing 228 to 256 mm.

Nisbett gives the average weight of the males as 3 lb. and that of the females as 2½ lb.

Distribution. Between the Irrawaddy and the Salwin, West and East and between latitudes 27° on the North and 21° on the South, working down the higher ridges above the Salwin as far South as 20°.

Nidification. Nothing recorded but they probably breed principally in April and May.

Habits. Nesbitt records these birds as common in the very open evergreen-forest between 3,000 to 5,000 feet in Winter, but he saw none after the breeding-season commenced and they probably work up higher at this time. About April the cocks could be heard challenging one another in all directions but there were no signs or sound of them after the end of that month.

Individuals are often met with on the extreme West above the Irrawaddy, which are obvious hybrids with *Gennæus horsfieldii*. In

one brood many variations may be seen and even occasionally cocks with one leg green and one red. *Gennæus h. horsfieldii* comes very far up the Irrawaddy valley; doubtless many cocks wander high up and meet wandering hens of *G. n. rufipes* and *vice versâ*, so that we get the two extremes of one great series of races meeting and forming genuine hybrids, not merely the intermediate forms of subspecies in intermediate areas called hybrids by Beebe and others.

Genus **LOPHOPHORUS.**

Lophophorus Temm., Pig. et Gal., ii, p. 355 (1813).

Type, *Lophoporus refulgens* Temm. = *Phasianus impejanus* Lath.

This genus contains three species of magnificent Pheasants which are distinguished by the metallic plumage of the males; the bill is long and greatly curved, the maxilla much overlapping the mandible; the tarsi and feet are very powerful and heavy, the former feathered above and with a short shiny spur; the face is more or less naked and highly coloured; the wings much rounded, the first primary the shortest, the fifth and sixth subequal and longest; the tail is shorter than the wing, rounded in varying degree and contains 18 feathers.

The three species vary *inter se* so greatly that many systematists would place them in different genera—a procedure fortunately quite unnecessary, as there are so few species to be considered.

Key to Species.

A. Most of the upper plumage metallic.
  a. Crest composed of feathers with naked shafts and spatulate ends; tail rufous tipped darker ..... *L. impejanus*, ♂, p. 335.
  b. Crest composed of short curly feathers; tail black at base, then chestnut with a broad white terminal band ..... *L. sclateri*, ♂, p. 337.
  c. Crest of long slightly lanceolate feathers; tail metallic green with some white spots ..... *L. l'huysii*.

B. Upper plumage a mixture of buff, brown and rufous-buff, never metallic.
  d. Lower back buff barred with black .... *L. impejanus*, ♀, p. 335.
  e. Lower back and rump pale earthy-white with narrow bars of brown ..... *L. sclateri*, ♀, p. 337.
  f. Lower back white ..... *L. l'huysii*, ♀.

Lophophorus l'huysii does not occur within our limits but is found in Eastern Tibet and may some day be recorded.

(1928) Lophophorus impejanus.

THE IMPEYAN PHEASANT or MONÁL. ×

Phasianus impejanus Lath., Ind. Orn., ii, p. 632 (1790) (India).
Lophophorus impeyanus. Blanf. & Oates, iv, p. 96.

Vernacular Names. *Lorst* ♂, *Ham* ♀; *Nil-mohr*, *Jangli Mohr* (Kashmir); *Nilgur* (Chamba); *Munal*, *Nil* ♂; *Karari* ♀ (Kulu); *Munal*, *Ghar-munal*, *Ratia Kawan*, *Ratnal*, *Rátkap* (N.W. Himalayas); *Datiya* (Kuman and Garhwal); *Dafia* (Nepal); *Fo-dong* (Lepcha); *Chamdong* (Bhut., Sikkim); *Chadong* (Tibetan, Chambi Valley); *Pia-Padir* (Mishmi).

Description.—Adult male. Head and long crest of spatulate feathers metallic green; a patch of deep metallic purple behind the ear-coverts; lores and a streak behind the eye nearly bare; sides of neck and nape fiery copper-bronze changing gradually into bronze-green on the back; scapulars and adjacent wing-coverts, innermost secondaries and rump purple, the secondaries



Fig. 42.—Head of *L. impejanus*, ♂. ½.

tipped metallic green-blue; lower back white, sometimes pure, sometimes with fine black shaft-stripes; rump and shorter tail-coverts purple, more or less glossed with blue-green; longest tail-coverts metallic green; tail cinnamon, darker at the tip; shoulder of wing and remaining coverts metallic green; primaries and secondaries dark brown, the latter glossed with green on their margins; underparts brownish-black or dull black, glossed with green on the breast and flanks, under tail-coverts metallic green with dark bases.

Aberrant plumage in this species is exceptionally coloured and there are specimens which show the following features: one with a wholly black tail; some with blue interscapulars; some with the whole lower plumage metallic green and others again which are melanistic or partly albino.

Colours of soft parts. Iris brown; orbital skin and cheeks bright blue or smalt-blue; bill horny-brown, paler and yellowish on the culmen, tip and commissure; legs yellowish or pale

brownish-green, sometimes darker and, rarely, plumbeous. The colours of all these parts vary greatly.

Measurements. Wing 289 to 320 mm.; tail 215 to 235 mm.; tarsus about 70 to 80 mm.; culmen about 50 to 54 mm.; crest 75 to 88 mm. "Weight about 5 lbs." (*F. M. Bailey*).

Female. Feathers of head and short lanceolate crest black with central streaks and edges of rufous-buff; nape the same with broader streaks; back and mantle black, with two buff streaks and buff edges to each feather; here and there the buff is replaced with white, giving a curious mottled appearance; lower back buff with crescentic black bars; tail-coverts buff with larger bars occupying most of the feathers; longest tail-coverts with white tips; tail boldly barred black and rufous and tipped white; visible parts of wing-coverts and secondaries like the back but more mottled; primaries and outer secondaries dark brown, the former mottled, the latter barred with rufous-buff on the outer webs; chin, throat and fore-neck white; remainder of lower parts brown, the breast and flanks with dark lines, these more broken and fewer on the abdomen and lower breast, their place being taken by pale central streaks and white shafts; lower tail-coverts white, barred with black and rufous.

Measurements. Wing 259 to 287 mm. "Weight 4 lbs. 11 oz." (*F. M. Bailey*).

Young males are like the female but more mottled with black above and with black and rufous below.

Chick in down. Crown rufous-chestnut with a central black line; nape brown mottled paler; back chestnut-brown with lateral streaks of buff; wing and tail pale cinnamon-buff with blackish pencillings; below dirty fulvous-buff.

Distribution. Afghanistan and the Western Himalayas through Kashmir, Garhwal, Nepal, Sikkim, Bhutan, Chambi Valley, South Tibet to the Mishmi Hills. It is common on the Afghan boundary but it is not known how far West it penetrates into that country.

Nidification. The Monal breeds during May and June, sometimes a little earlier, from about 8,000 feet up to the limit of the birch-forests. In the Simla Hills the eggs have been taken at 7,000 feet. They do not select very heavy forest but prefer such as is fairly free of undergrowth but at the same time rocky and very broken up. Here they make a scratching under the shelter of a rock, tree or bush and lay four or five eggs on a bed of fallen leaves and rubbish. Two *may* occasionally be incubated whilst apparently they never lay more than six at the outside. In colour the eggs vary from a very pale dull yellowish stone-colour to a fairly warm buff. Some eggs are freckled all over with minute specks and small blotches of reddish-brown and with secondary markings of grey and pale purple, not noticeable unless carefully examined. Other eggs have the blotches larger

and more sparse and are quite handsome eggs. In shape they are long rather pointed ovals and fifty-eight average 64·7 × 44·8 mm.: maxima 69·8 × 44·8 and 62·6 × 48·8 mm.; minima 59·6 × 45·3 and 61·0 × 39·6 mm.

The display is described by Major Roden, who says the cock suddenly advances towards the hen with his tail spread, feathers distended and his wings held high over his back. They are said to be polygamous and the hen is left to do all the incubation and rearing of the young.

Habits. This, the most magnificent of all our Pheasants, is still a comparatively common bird in many parts of Garhwal, Kashmir, the Kulu and Kangra Valleys and certain other districts. They frequent light forest and seem particularly fond of birch-forest, light oak and rhododendron forests wandering out into the open glades and grassy slopes outside the forests when feeding in the mornings and evenings. It feeds on roots, leaves, berries, acorns and many shoots of plants, as well as on grubs and larvæ, for which it is said to sometimes continue digging for hours at a time. Young birds are considered good for the table, though the old birds are tough and stringy. Their call is described as a shrill whistle uttered both on the ground and when just on the wing. They are good fliers but, like most of our Indian Pheasants, prefer to run whenever possible.

(1929) Lophophorus sclateri.

SCLATER'S MONAL.

Lophophorus sclateri Jerdon, Ibis, 1870, p. 148 (Mishmi Hills); Blanf. & Oates, iv, p. 98.

Vernacular names. *Dong* (Tibetan, Po Ba dialect); *Pui-de* (Bhutea); *Tratta*, *Poa-padoi* (Mishmi).

Description.—Adult male. A tuft of feathers below the nostril and a narrow line from the upper corner of the nostril to the crown black; crest of short curly metallic feathers blue-green; ear-coverts and narrow line behind the crest black with blue-green reflections; whole mantle deep purple blue-green, more purple on the shoulders; lower back, rump and upper tail-coverts white with a few black shaft-stripes and, in one specimen, metallic white spots at the tips; tail mottled black, rufous and white on the basal half, the central portion a rich rufous with a terminal white band; lesser and median wing-coverts bronze-green shot with copper; greater coverts and inner secondaries deep metallic blue-green; primaries and outer secondaries velvety blue-black; lower plumage velvety black.

Colours of soft parts. "Iris dark brown; bill dirty white; legs pale greenish; bare orbital space blue" (*F. M. Bailey*). "Iris dark purplish-blue; naked skin peacock-green" (*Forrest*).

Measurements. Wing 292 to 325 mm.; tail 194 to 206 mm.; tarsus 78 to 82 mm.; culmen about 50 mm.; short blunt spur 12 to 18 mm. "Weight 5 lb." (*Bailey*).

Female. Upper part of head and whole neck vandyke-brown with a buff V-shaped mark on each feather; lores white, mottled with fulvous and brown; sides of head paler than the crown; back, scapulars, adjoining wing-coverts and innermost secondaries rich chocolate-brown with buff central streaks widening into ill-defined rufescent bars; lower back, rump and tail-coverts dull earthy-white, rufescent next the back, more white on the longest tail-coverts, irregularly barred with narrow wavy lines of brown, boldest and darkest on the longest tail-coverts; tail black, broadly tipped with white and with six or seven narrow bars of white, the central feathers mottled with rufous on their terminal halves and all with a more or less mottled edge of brown-buff; primaries and secondaries umber-brown, the latter mottled on the margins with buff and brown; remainder of visible wing black with numerous bars of rich chestnut-rufous and very fine buff shaft-streaks; chin and throat white; remainder of lower plumage dull brown densely covered with tiny wavy bars of dull ochre.

Colours of soft parts. Iris brown; bill pale yellow or horny-green; legs dull pale greenish lead-colour.

Measurements. Wing 279 mm.; tail 193 mm.; tarsus 71 mm., culmen 48 mm.; short crest about 18 mm.

Distribution. Hills North of the Assam Valley from the Eastern Dafla Hills, thence North into South-East Tibet and East into Yunnan, where Beebe obtained one and Forrest eight specimens.

Nidification. Nothing recorded. A clutch of five eggs brought to me by some Abor Headmen together with some skins, one of which, a hen, had been trapped on the eggs, are like those of *L. impejanus* but exceptionally handsomely marked. They average 63·2 × 45·4 mm. They were given to me on the 7th June and were taken between the 1st and 3rd of that month at an elevation of about 9,000 feet on a peak North of Sadiya.

Habits. Very little is known about this Monal. Forrest found it up to 11,000 and 12,000 feet in forest in Yunnan and Chatterton came across a flock at a little over 9,000 feet just above Sadiya and close to where my eggs were taken. These latter birds also were in dense forest, the ground very steep and broken and the trees all oaks and rhododendrons, amongst which the birds moved about very warily and defied any close approach. There were also great stretches of magnificent pines, not apparently ever frequented by the Monal, though there were plentiful signs of where they had dug for roots in the open grass hill-tops, just outside the oak-forests. The call is a loud whistling note apparently very similar to that of the Impeyan Pheasant and Bailey says that they are very noisy in the evenings.

Genus CROSSOPTILON.

Crossoptilon Hodgs., J. A. S. B., vii, p. 866 (1838).

Type, *Phasianus tibetanus* Hodgs. = *Crossoptilon crossoptilon* Hodgs.

The genus *Crossoptilon* contains the birds popularly known as Eared Pheasants from the fact that their ear-coverts are so prolonged that they stick out behind the head like two small horns or ears.

In this genus the tail-feathers number 20 to 24, very broad at the base, less compressed than in *Gennæus* and with the webs very soft, broad and decomposed; the wings are rounded in typical Pheasant shape, the first primary short and the fifth and sixth equal and longest; the sides of the head are naked, covered with papillæ and bright red in colour; the legs are powerful and the tarsi are furnished with short blunt spurs in the male.

The sexes are similar in coloration.

At present only one species is known to occur within our limits *, *Crossoptilon harmani*.

Rothschild shows that this form cannot be considered a race of *auritum* as the character and structure of the tail-feathers are different. He therefore places it as a subspecies of *Crossoptilon crossoptilon* (*tibetanum* auctorum) but it does not seem to me that our present material suffices to prove this, so for the time being I give our bird specific rank.

(1930) Crossoptilon harmani.

ELWES'S HORNED PHEASANT.

Crossoptilon harmani Elwes, Ibis, 1881, p. 399, pl. xiii (Eastern Tibet).

Vernacular names. *Cha-nga* (Tibet).

Description. Crown of head from forehead to nape velvety black; chin, throat, extreme fore-neck, ear-coverts and across the nape white; above deep ashy-grey, almost black on the neck; rump and upper tail-coverts much paler ashy-grey; wing-quills brown, the remainder of the visible wing like the back, the inner secondaries slightly glossed with purple-blue; sides of the neck and breast deep glossy ashy-grey changing to paler ashy-grey on the flanks and lower breast and to white down the centre of the fore-neck and centre of the abdomen; the tail is metallic blue-black, glossed with green and blue, the middle tail-feathers changing to purplish-grey at their bases.

Colours of soft parts. Iris brown to orange-brown; bill light reddish-horny, legs scarlet, naked skin of face scarlet.

* Very full descriptions of all the Eared Pheasants are given in the 'Journal of the Bombay Natural History Society,' xxiv, part 4, pp. 625 *et seq.* (1916), to which sportsmen who shoot specimens of these birds may refer.

Measurements. Wing 292 to 231 mm.; tail 457 to 559 mm.; tarsus 87 to 93 mm.; culmen about 40 to 44 mm. The spur is short, about 15 to 20 mm.

Chick, about 14 days old. Crown velvety-black; upper plumage dull black changing to dark ashy-grey on the rump and upper tail-coverts; the wings are vermiculated with reddish bars and the coverts have broad reddish shaft-streaks; white on the head as in the adult, the ear-tufts showing distinctly; upper breast and flanks black, the feathers centred and edged fulvous; lower breast and abdomen dirty white, vent and under tail-coverts dull ashy-grey tipped with white; tail-feathers blue-black glossed with blue, showing green in some lights.

"Iris brown; bill horn-coloured, paler below; legs reddish-brown," (*Bailey*).

Distribution. Abor and Mishmi Hills, North of Assam and South-East Tibet. Probably common on all the higher ranges of the watershed of the Brahmapootra.

Nidification. Nothing recorded. I have four eggs taken in the Abor Hills on the 26th of May which are those of a *Crossoptilon* and must be of this species. They are the usual grey-green colour of all *Crossoptilon* eggs and have the normal soft smooth texture without any real gloss. They measure 58·5×41·6, 56·2×41·7, 58·4×41·6 and 56·7×42·0 mm. They were taken at an elevation of some 11,000 or 12,000 feet, laid on the ground in deep forest. Bailey's chick, described above, was about 14 days old on the 16th July; he saw another well-grown young one on the 24th August and broods of freshly-hatched young on the 18th July, so that presumably May and June are the months in which the eggs are laid.

Habits. This Pheasant is apparently found between 10,000 and 15,000 feet, less often as low as 8,500, whilst the type-skin came from a place recorded as "about 6,000 feet." They frequent forest and at the higher elevations dwarf rhododendron, moving about in small flocks of five to ten individuals, feeding in the open glades and on the hill-sides outside forest. They are noisy birds with a loud whistling call, uttered most often in the mornings and evenings. When disturbed they usually fly into a tree and their ordinary flight is said to be heavy and by preference always down hill.

Bailey found both cock and hen looking after the young, so they are not polygamous.

Subfamily PERDICINÆ.

In the *Perdicinæ*, or Partridges, the moult of the tail-feathers commences with the central pair followed by each succeeding pair to the outermost. The other differences between this Subfamily and the *Phasianinæ* have already been dealt with

in the description of that Subfamily and need not be repeated here. Unless great importance is placed on the moult of the rectrices, the super-generic differences are of but trivial importance and, but for the convenience of splitting so large a Family as the *Phasianidæ* into two groups, I should not accept them as sufficing for the differentiation of the two groups.

Key to Genera.

A. First primary shorter than tenth.
  a. Tail-feathers eighteen ..... TRAGOPAN, p. 342.
  b. Tail-feathers fourteen.
    a'. Wing over 215 mm.; plumage of male with some green and crimson ..... ITHAGINIS, p. 351.
    b'. Wing under 215 mm.; plumage with no green or crimson in male.
      a''. Sexes different; spurs on tarsi of both sexes ..... GALLOPERDIX, p. 357.
      b''. Sexes alike; no spurs on tarsi of either sex ..... BAMBUSICOLA, p. 365.
  c. Tail-feathers ten ..... OPHRYSIA, p. 356.

B. First primary equal to or longer than tenth.
  d. Size small; wing under 120 mm.
    c'. Tail-feathers eight ..... EXCALFACTORIA, p. 369.
    d'. Tail-feathers ten to twelve.
      c''. First primary larger than fourth. COTURNIX, p. 372.
      d''. First primary between seventh and tenth ..... PERDICULA, p. 376.
      e''. First primary equal to tenth .. CRYPTOPLECTRON, p. 380.
  e. Size moderate; wing over 120 mm.
    e'. Tail-feathers twelve.
      f''. Upper parts green; male crested. ROLLULUS, p. 367.
      g''. Upper parts pale grey or isabelline ..... AMMOPERDIX, p. 405.
      h''. Upper parts mostly rufous-brown ..... RHIZOTHERA, p. 400.
    f'. Tail-feathers fourteen.
      i''. Tarsus naked.
        a^3. Tail less than half length of wing.
          a^4. Hind toe with a claw; no spurs.
            a^5. No white axillary tuft .. ARBOROPHILA, p. 385.
            b^5. A white axillary tuft .. TROPICOPERDIX, p. 397.
          b^4. Hind claw rudimentary; spurs present ..... CALOPERDIX, p. 399.
        b^3. Tail more than half wing.
          c^4. Flanks boldly barred .... ALECTORIS, p. 401.
          d^4. Flanks not barred..... FRANCOLINUS, p. 407.
      j''. Tarsus half clad with feathers . LERWA, p. 432.
    g'. Tail-feathers sixteen to eighteen; wing under 180 mm. ..... PERDIX, p. 422.
    h'. Tail twenty to twenty-two feathers; wing over 250 mm. .. TETRAOGALLUS, p. 426.

Genus TRAGOPAN.

Tragopan Cuvier, Règ. Anim., 2nd ed., i, p. 479 (1829).

Type, *Meleagris satyra* Linn.

The genus *Tragopan* contains the birds popularly known as Horned Pheasants—a name I propose to continue to use, although technically these birds are nearer the Partridges than the Pheasants. The males are magnificent birds, generally with a great deal of crimson in their plumage, whilst the females are brown or brown-grey birds mottled with black, rufous and white.

In shape these birds are like huge Partridges; the tail is equal to or a little longer than the wing, strongly graduated and carried in the same manner as that of the Common Partridge; the legs are very powerful and are armed with a short blunt spur; the wings are rounded, the first primary the shortest and the fourth and fifth primary subequal and longest, whilst the bastard-wing, or winglet, is much developed; the bill is small, the feathers of the forehead coming almost up to the nostril; in most species the sides of the face are bare but not in the Crimson Tragopan; the chin and throat are sparsely feathered in the adults but fully in the young.

Two small, fleshy, brightly-coloured horns lie hid on either side among the feathers of the crown, which in the breeding-season become swollen and erectile; there is also some folded wrinkled skin dependent from the chin which in display becomes a brilliantly-coloured lappet of about two inches or more.

Five species are known of which four come within our limits. They extend throughout the Indo-Chinese Mountains from Kashmir to Eastern China.

Key to Species.

A. Head black with crimson markings. (Males.)
  a. Below crimson with black-edged white spots ..... *T. satyra*, p. 343.
  b. Below black with white spots ..... *T. melanocephalus*, p. 345.
  c. Breast crimson-red; abdomen smoky or sepia-grey ..... *T. blythi*, p. 347.
  d. Below crimson, feathers centred with pearl-grey ..... *T. temminckii*, p. 350.
B. Head brown, mottled like the back. (Females.)
  e. Upper plumage streaked with fawn or buff.
    a'. Shoulder of wing tinged with crimson.
      a''. General tint paler and more buff; black markings fewer .. *T. satyra*, p. 343.
      b''. General tint darker and black markings predominating .... *T. blythi*, p. 347.
    b'. No crimson on shoulder of wing .. *T. temminckii*, p. 350.
C. Upper plumage streaked with white .. *T. melanocephalus*, p. 345.

(1931) Tragopan satyra.

THE CRIMSON HORNED PHEASANT.

Meleagris satyra Linn., Syst. Nat., 10th ed., i, p. 157 (1758) (Sikkim).
Tragopan satyra, Blanf. & Oates, iv, p. 99.

Vernacular names. *Lungi* (Hind., Garhwal and Kuman); *Monal Kinda*, Nepal); *Omo, Bap* (Bhutea); *Tar-rhyak* (Lepcha); *Cham-dong* (Tibetan).

Description.—Adult male. Head, crest and a ring round the semi-naked gular pouch black; a streak on either side of the crest, sides and back of neck, upper back and whole lower plumage orange-crimson, the upper back and lower plumage from the breast to the vent with white black-edged ocelli; on the breast and back the spots are small and completely surrounded by black, towards the vent the spots get larger and larger, less pure and more grey and the black less and less in extent, the spots on the posterior flanks and abdomen becoming large grey



Fig. 43.—Head of *T. satyra*, ♂. ½.

spots with black at the bases only; under tail-coverts crimson with white ocelli surrounded by brown, and with black terminal fringes; lower back, scapulars, rump and shorter tail-coverts olive-brown with white black-edged ocelli and black and rufous-buff vermiculations; longer tail-coverts amber-brown with sub-terminal broad black edges; the scapulars are profusely marked with crimson and a few similar marks occur on the back outer rump and tail-coverts; shoulder of wing crimson; coverts like the scapulars, the greater with broad bases of mottled black and buff; inner secondaries like the greater coverts but with no crimson; outer secondaries and primaries deep brown, with numerous broken mottlings of buff; bastard-wing chestnut mottled with dark brown on the inner webs at the tip.

Colours of soft parts. Iris brown; bill black, browner and paler on the terminal half; legs dull fleshy, suffused with blood-crimson in the breeding-season; spur pale grey-brown, whitish

at the tip; horns, orbital skin and lappet Prussian-blue; when extended the latter shows a bright sage-green edge with four or five triangular patches of brilliant scarlet.

Measurements. Wing 245 to 285 mm.; bastard-wing up to 137 mm.; tail 232 to 300 mm.; tarsus about 85 to 90 mm.; culmen 14 to 16 mm. "Weight 3 lbs. to 4 lbs. 10 oz." (*Hume*).

Female. Whole plumage above, under wing-coverts and axillaries rufous-buff or rufous-ochre, vermiculated, barred and blotched with black and with narrow pale ochre central streaks; tail rich rufous-brown with broken buff and black bars, the black grading into the general rufous-brown; the black on the inner webs of the outer tail-feathers developing into broad well-defined bars; chin and throat pale or albescent; breast like the back but paler and less richly coloured; still paler on the abdomen and vent, where the central ochre streaks become large white spots.

The variation in colour in the females is very great; in some the rich rufous tint is absent and is replaced with grey; the size and brightness of the ochre streaks differ individually; in a few birds there are chestnut markings on the centre of the crown and on the scapulars, wing-coverts and inner secondaries.

Colours of soft parts. Iris brown; bill horny-brown; legs fleshy grey-brown.

Measurements. Wing 215 to 235 mm.

Young birds are like the female but less richly coloured.

Chick in down. Crown and nape rich chestnut changing to chestnut-brown on the back, rump and tail-tuft; lores, an indistinct supercilium and sides of head and nape fulvous, the latter mottled with chestnut; forehead more orange-rufous; below pale fulvous or yellow-buff, greyer and duller on the abdomen.

Distribution. Garhwal, East through Nepal, Sikkim to Assam, North of the Brahmapootra as far East as Darrang. Whymper has shot *satyra* on the East bank of the Alaknanda river and *melanocephalus* on the West bank of the Bhagirathi and says that roughly the upper waters of the Ganges may be taken as the dividing-line between these two species.

Nidification. The Crimson Horned Pheasant breeds throughout its habitat between 9,000 feet and the limits of forest-growth. Hume obtained eggs from natives but with no satisfactory data, and the only other eggs known laid by wild birds are two clutches of two each, taken at the head of the Chambi Valley on the Sikkim-Tibet borders. Both were taken in the end of May from very rough stick-nests in small oaks, growing in stunted oak- and rhododendron-forest at about 10,000 feet elevation. The eggs are very rich deep rufous-red, almost like Peregrine Falcons' eggs. Other eggs laid in

captivity and another pair from Garhwal are similar in every respect but colour, varying from a pale bright rufous-buff to a bright reddish-buff. All the eggs have minute frecklings of a darker colour but in most so microscopical as not to show up unless very carefully examined. Twelve eggs average 60·6 × 42·9 mm. These Pheasants are probably monogamous.

The males display under the urge of either anger or sexual excitement but the full exhibition of horns and lappets only in the latter case. The manner of exhibition is given in full under *Tragopan blythi* and in all species the exhibition seems only to vary in the colour of the horns and lappets.

Habits. This magnificent bird frequents elevations between 8,000 and 12,000 feet, higher still where forest and other conditions are suitable and down to 6,000 feet in Winter. It is essentially a bird of deep forest, though they feed in the open, mornings and evenings, digging up bulbs and roots, their favourite diet, but also eating seeds, shoots and tendrils. There is no proof that they ever eat insects, reptiles etc. They are determined skulkers, stout and speedy runners but poor birds from a sportsman's point of view. They can fly fast enough when put up and they have the Indian Pheasant's trick of hurling themselves headlong down the sides of steep hills, but they live in the steepest, most broken country, where it is very hard to get at them and then harder still to make them rise. Their notes are those of the genus.

(1932) Tragopan melanocephalus.

THE WESTERN HORNED PHEASANT.

Phasianus melanocephalus Gray, in Griff. ed. Cuv., iii, p. 29 (1829) (Almorah).
Tragopan melanocephalus. Blanf. & Oates, iv, p. 100.

Vernacular names. *Jowar* (Garhwali); *Jaghi, Jatjhi* (Basahir); *Sing-Monal* (N.W. Him.); *Jigurana* ♂, *Bodal* ♀ (Kulu, Mandi, Suket); *Falgar* (Chamba).

Description.—Adult male. Head, except bare skin of face and throat, black, the longer crest-feathers tipped crimson; neck all round below the black crimson-red; remainder of upper parts greyish-ochre vermiculated with black bars and with white, black-edged ocelli; interscapulars often strongly tinged with rufous, looking darker and richer than elsewhere; longest upper tail-coverts with black tips and large white central patches edged with rufous; tail mottled black and ochre with broad black terminal bars; shoulder of wing crimson-red; wing-coverts like the back but with larger ocelli and more ochre mottling; innermost secondaries mottled ochre and black with terminal heart-shaped white ocelli surrounded with olive-rufous and black and a few olive-rufous almond-shaped spots

surrounded with black only; bristly feathers of fore-neck and upper breast a gorgeous orange flame-colour; remaining lower plumage black with bold white ocelli: the bases of the feathers are red and show up everywhere; flanks, vent and under tail-coverts more or less mottled with ochre and brown; under wing-coverts mottled brown and ochre and marked with crimson; axillaries deep brown.

Colours of soft parts. Iris brown; bill black or blackish-brown; orbital skin bright red; horns bright pale blue, sometimes tinged with green; lappet bright fleshy-pink, a deep purple line down the centre and triangular patches of blue with their bases joining on the centre line; on the lower part of the cheeks there are bluish-green caruncles; legs and feet fleshy-grey or fleshy-red with a tinge of purple, deeper and redder in the breeding-season.

Measurements. Wing 257 to 290 mm.; tail 221 to 247 mm.; tarsus 78 to 97 mm.; culmen 17 to 20 mm.

Weights of freshly-killed birds from Kashmir 4 to 4¾ lb.

Female. Above pale grey, profusely vermiculated with black and with black patches on the scapulars and inner secondaries and, to a less extent, on the back; the feathers of these parts have also here and there white central streaks or arrow-head marks; on the head and neck the tint is rather more rufous with the centre of the crown blackish, the feathers white-centred; tail vermiculated black and grey with a broad subterminal band of black on all but the central tail-feathers; below finely vermiculated grey and dark brown, the feathers of the chin, throat and sides of the head with pale fulvous centres and those of the breast and abdomen with spatulate white centres edged with black.

In the female of *T. melanocephalus* the whole appearance is that of a grey bird instead of rufous-brown as in *T. satyra*.

Measurements. Wing 225 to 250 mm.

Young males are like the females but the marks below are reduced and less spatulate in shape.

Distribution. From the West bank of the Bhagirathi River in Garhwal to Hazara and Kashmir.

Nidification. Lautour took a clutch of four eggs of this bird from a rough stick-nest built on the ground in Pine-forest between 8,000 and 11,000 feet in a place where there had been a land-slip. Whymper also found a "respectable loose stick-nest with a little grass lining" at about 11,000 feet in Ringal jungle in Garhwal, the eggs of which had been destroyed by vermin. This nest also was on the ground, yet the natives assert that normally the Tragopan is a tree-builder and certainly birds in captivity prefer to nest, if given the choice, in boxes placed well up in trees or on shelves rather than in those on the ground. The eggs are typical of the genus but average

decidedly paler and duller than those of *T. satyra*. The few, including those laid in captivity, which I have been able to measure average 62·2×42·0 mm. and vary very little in size or shape.

Habits. Those of the genus. They appear to consort in small family-parties except during the actual breeding-season and it is by no means a rare bird still in many parts of Kashmir and Garhwal, though its secretive habits make it appear to be so. It comes comparatively low down in Winter and Donald has shot it at 4,000 feet. He says that it is one of the best of game-birds for the table.

Tragopan blythi.

Key to Subspecies.

A. Paler; red of the breast forming a very broad gorget ..... *T. b. blythi*, p. 347.
B. Darker; red of the breast forming a very narrow gorget only ..... *T. b. molesworthi*, p. 349.

(1933) Tragopan blythi blythi.

THE GREY-BELLIED TRAGOPAN.

Ceriornis blythi Jerdon, P. A. S. B., 1870, p. 60 (Henema, Naga Hills).
Tragopan blythi. Blanf. & Oates, iv, p. 102.

Vernacular names. *Tur-huria* (Assam and Miri) *San-sora* (Assam, Sadya); *Gnu* (Angami Naga); *Aghah* (Sema Naga); *Aogho* (Chang Naga); *Chingtho* (Kuki).

Description.—Adult male. Forehead, crown, a patch down either side of the neck and feathers round the bare facial and gular skin black; broad supercilia, nape and occiput, remainder of neck, extreme upper back, shoulders of wing and upper breast crimson Indian-red, occasionally with a tinge of orange; remainder of upper plumage and wing-coverts black, each feather with numerous semi-concentric bars of buff, a terminal ocellus of white edged with olive-brown and black and two subterminal ocelli of deep maroon-red, also edged olive-brown and black; the basal mottling of black and buff are entirely concealed, so that the upper plumage seems to be a mass of white and maroon ocelli; longest upper tail-coverts whitish with narrow edges of olive-brown, next to these edges are bars of black and then broader bars of red-brown fading into the white; tail black with irregular broken bars of rich buff on the basal third; bastard-wing light brick-red on the outer webs, mottled with black on the inner webs; primaries and outer secondaries brownish-black, with broken buff bars, obsolete on the inner webs of the primaries; lower breast and abdomen

smoky-grey, the centres paler and showing up distinctly against the rather darker margins; flanks and thighs with black and buff mottlings and these parts, the vent, and sometimes the under tail-coverts splashed with crimson-red.

Colours of soft parts. Iris hazel-brown; bill dark horny, gape and commissure paler and tinged with fleshy; legs dull yellowish or reddish-brown, brighter and redder in the breeding-season; horns bright pale blue, rarely with a verdigris-green tinge; lappet orange-yellow or yellow, palest on the lower portion, orange and mottled with red on the upper part as well as on the orbital skin and cheeks; the lower part is edged with pale blue and blue veinings run in from the edge to the centre.

Measurements. Wing 260 to 265 mm.; tail 180 to 220 mm.; tarsus 82 to 94 mm.; culmen about 10 mm.; the horns in the breeding-season measure 26 to 32 mm.; the lappet about 75 mm. long by about 36 mm. broad.

Female. Whole upper plumage black with narrow bars, patches and stippling of rufous; in addition each feather has a V-shaped or crescentic central mark of buff, a few having two of these marks besides longitudinal marks of the same colour; the tail is lighter and has much of the black replaced by rich rufous; chin and throat white with brown spots, the former almost immaculate; lower plumage and flanks mottled and stippled with very dark brown, dull rufous and greyish-white, the latter forming distinct spots on many of the feathers; centre of abdomen and vent more grey and uniform; under tail-coverts darker and more richly coloured.

Measurements. Wing 230 to 245 mm. ♀.

Young male like the female but changing in the first Spring moult from this to a plumage halfway between that of the male and female.

Distribution. The hills South of the Brahmapootra from the Barail Range in North Cachar and the Naga Hills Eastwards through the Patkoi Range into North-West Burma and South-Eastwards through Manipur into the Chin Hills.

Nidification. The breeding-season of this Pheasant commences in early April and lasts well into May. The Nagas say that they make a rough but bulky nest of twigs and leaves in trees at any height from ten to twenty feet and that they only lay from two to five eggs, generally three or four. A hen in my own aviaries persistently tried to lay her eggs on a perch until I gave her a box of twigs placed on a bough at the top of the aviary, when she laid in that. Boxes on the ground she would have nothing to do with. The two eggs saved were a pale buff, the texture, as usual, smooth and fairly fine but very stout and strong. They measure 59·7 × 42·6 and 57·8 × 45·4 mm. A third egg laid by a hen in another box high up measured 58·6 × 43·7 mm. The colour is pale buff obsoletely freckled with chocolate.

A wild bird displayed to a hen in my presence in the following manner. After several semi-displays he stopped; suddenly he shook himself violently, the horns inflated and shot quite forward and the bib rolled out to its full extent; standing still in front of the hen, he leant forward until his breast touched the ground, both wings fully extended were raised above his back so that he looked like a gorgeous fan, his horns quivering and his bib nervously contracting and expanding. For a few seconds he remained thus and then just as suddenly he collapsed into a normal Pheasant, scratching and hunting for food.

Habits. The Grey-bellied Tragopan is found principally between 6,000 and 9,000 feet in very dense evergreen-forest with plenty of undergrowth, where it goes about in small parties of four or five. It feeds on all kinds of seeds, berries, fruit and buds, whilst those I had in aviaries greedily ate worms, insects and small frogs. Their call is a very fine sonorous "Wak," sometimes lengthened into "Wa-ai-ai" and very reminescent of a Peacock's call, though much less harsh. They are not shy birds and are very easily caught in nooses, though it is a difficult matter to get a shot at them.

(1934) Tragopan blythi molesworthi.

THE TIBETAN TRAGOPAN.

Tragopan blythi molesworthi Stuart Baker, Bull. B. O. C., xxxv, p. 18 (1914) (Tawang Tibet).

Vernacular names. *Bop* (Tibet).

Description. Differs from the preceding bird in having the whole upper parts much darker, the rufous spots browner and the buff vermiculations narrower and less distinct; the white spots are also smaller; the red of the breast is confined to a narrow gorget below the lappet and the rest of the lower parts are much paler than in *T. b. blythi*.

Colours of soft parts not recorded.

Measurements. Wing 250 mm.; tail 195 mm.; tarsus 75 mm.; culmen about 19 mm.

Female unknown.

Distribution. The type was obtained by Capt. Molesworth on the Tse-la, Tawang, Tibet in the mountains due North of Dibrugarh in Assam. It seems probable that it extends along the mountains between 6,000 and 12,000 feet from Bhutan to the Brahmapootra on the East. The bird obtained by Cran in the Dafla Hills must have been of this race, whilst members of the Mishmi Expedition of 1911–1912 frequently came across a Tragopan which was almost certainly the same.

Nidification. Nothing known.

Habits. Probably much the same as those of the preceding bird. Molesworth obtained the type at 8,000 feet, whilst in

the Mishmi Hills it was frequently seen at 9,000 and 10,000 feet. The Abors knew this Tragopan and told me that it came no lower down than 7,000 feet and that Sclater's Monal and the Tragopan lived in the same jungles and kept to the same elevations. Col. J. Chatterton came across them more than once but informed me that they kept to the thickest undergrowth and were very hard to get a glimpse of, though not shy.

(1935) Tragopan temminckii.

TEMMINCK'S TRAGOPAN.

Satyra temminckii Gray, Ill. Ind. Zool., i, pl. 50 (1833) (Setchuan).

Vernacular names. *Bop* (Tibet); *Oua-Oua-ky*; *Ko-ky*, *Kiao-ky*, *Sin-tsiou-ky*; *Tso-chi* (Chinese).

Description.—Adult male. Forehead, lores, anterior crest, ear-coverts, sides of head and feathers surrounding gular skin black; posterior crest, centre of crown and nape, neck, extreme upper back and upper breast deep orange-red, changing into crimson-maroon on back, rump and shorter upper tail-coverts, the latter parts with ocelli of pure grey surrounded with black; longer tail-coverts dull pale red, the centres paler and greyish and the tips darker and richer red; all the feathers of the upper parts have their bases mottled blackish-brown and buff, showing through here and there; tail buff with a broad deep brown terminal bar and with numerous narrower bars and mottlings of the same colour; wing-coverts like the back but with larger ocelli; edge of wing and bastard-wing light brick-red; quills brown barred and mottled, especially on the outer webs, with rufous changing to buff on the secondaries; on the innermost secondaries there are large ill-defined ocelli and some crimson splashes: below the orange-red changes to Indian-red, paling again on the posterior flanks, thighs and under tail-coverts, the vent and centre of the abdomen almost yellowish-red; all the feathers of the lower plumage have clear grey central spots.

Colours of soft parts. Iris brown; bill black, paler at the tip; legs and feet pink or reddish, darker in the breeding-season; horns light peacock-blue; face and orbital skin blue; lappet blue mottled with reddish-yellow spots.

Measurements. Wing 225 to 263 mm.; tail 185 to 230 mm.; tarsus 70 to 80 mm.; culmen 15 to 16 mm.; horns about 30 mm.

Female. Whole upper parts mottled black and dull to bright rufous; wing-coverts, scapulars and back with arrow-shaped marks varying from white or pale grey to bright cream-buff; on the neck the marks are obsolete and on the crown become longitudinal and spatulate in shape; tail like the back but the markings form irregular bars; chin and throat unspotted buffy-white to rich buff; front and sides of neck buff or rufous, the

feathers edged with black; breast mottled with black or dark brown and fulvous with whitish centres; abdomen paler with more conspicuous white spots, vent, thighs and under tail-coverts with finer, duller mottling."

Measurements. Wing 220 to 230 mm.

Young male like the female.

Chick in down. Lores and crown bright rufous-green, changing to darker chestnut-brown on back and tail-tuft; circle round eye, sides of head and ear-coverts bright pale fulvous-rufous; below pale dull fulvous.

Distribution. In the West of its range this species is found in the same area as *Tragopan blythi* in both the Chin Hills and in South-Eastern Tibet, thence it extends through the Misumi Hills, Kachin Hills and Yunnan to Ta-tsein-lu, Setchuan, Shensi, Hupeh, as far East as the Mountains North-east of Hankow. Pailey records it as common on the Upper Dibong and Tsanpo Valleys. The first record of its occurrence within out limits was that of Mr. W. Scott from Sadone.

Nidification. Practically nothing on record. There are six eggs in the British Museum said to be a single clutch, but looking like two, taken in Ta-tsein-lu, and I have a three clutch in my collection taken by some missionaries on the 23rd May on Peling Mountain, Shensi. These were said to have been taken from a stick-nest in a tree and measure 54·1 × 41·4, 53·6 × 40·8 and 53·4 × 40·7 mm. The breeding-season probably lasts from early April to early June.

Habits. Apparently similar in every way to the other species. Wilson says that it is fairly common in parts of Hupeh and Setchuan between 4,000 and 9,000 feet.

Genus **ITHAGINIS**.

Ithaginis Wagler, Isis, 1832, p. 1228.

Type, *Phasianus cruentatus* Hardw.

This genus, which contains the Blood-Pheasants, is like *Tragopan*, one of those on the border-line between the Pheasants and the Partridges but moulting the tail-feathers in the order of the latter and so retained in the *Perdicinæ*.

In *Ithaginis* the tail is long, of fourteen graduated feathers; the wing is short and rounded, the first primary shorter than or nearly equal to the tenth, the fifth and sixth about equal and longest; the tarsi are long and stout and are furnished with several spurs in the male which show as knobs only in the tarsi of the female.

The bill is very Grouse-like in character, short, stout and rather hooked, whilst the eggs also are very like those of some Grouse.

There is a full soft crest and the plumage generally is very soft and lax, the feathers lanceolate in shape. Round the eye a small naked area. The sexes differ greatly in colour.

Rothschild * considers all the members of this group to be subspecies of *cruentus*. At present I cannot consider this proved. It is more than probable that *kuseri* and *tibetanus* will prove to be subspecies of *cruentus* but we want more specimens to prove or disprove connecting-links between the three and until we get them I propose to retain them on the status of species.

Within our limits only three forms have as yet been actually taken but it is possible *geoffroyi* or one of the races of that group may yet be found to occur in the extreme north-east boundary of Indo-Burma. This species is included in the key which will enable any field-naturalist or sportsman to identify it if obtained.

Key to Species.

Males.

A. Chin and throat crimson.
  a. Forehead black ..... *I. cruentus*, p. 352.
  b. Forehead crimson.
    a'. Anterior ear-coverts and gorget black .. *I. kuseri*, p. 354.
    b'. Anterior ear-coverts yellowish with black edges; no gorget ..... *I. tibetanus*, p. 355.
B. Chin and throat not crimson ..... *I. geoffroyi*.

Females.

A. Feathers of face and sides of head light ochre-brown, contrasting with grey crown.
  a. General plumage rufous-brown ..... *I. cruentus*, p. 352.
  b. General plumage brown ..... *I. kuseri*, p. 354.
B. Feathers of face and sides of head grading into and not contrasting with grey of crown . *I. geoffroyi*.

The female of *I. tibetanus* is not known.

(1936) Ithaginis cruentus.

THE BLOOD-PHEASANT.

Phasianus cruentus Hardw., Trans. Linn. Soc., xiii, p. 237 (1822) (Nepal).
Ithaginis cruentus. Blanf. & Oates, iv, p. 103.

Vernacular names. *Chilmeah, Chilmé, Chilmili, Seremin, Selmung* (Nepal); *Samé, Semo, Soomoong-pho* (Lepcha).

Description.—Male. Lores, forehead, supercilium and a broad line under the eye black; the black changing to buff on the crown and to grey on the longest crest-feathers, which have central white streaks; whole upper surface grey, with central white streaks, narrowest on the mantle, broadest on the rump and upper tail-coverts, where the streaks are edged with black; chin and throat crimson, the feathers with black bases and tiny yellow-white specks at the tips; ear-coverts, sides of head and neck black and white or yellowish-white, fore-neck

* Nov. Zool., xxxiii, p. 212 (1926).

yellowish-green with black bars and edges to each feather, the black varying much in extent; lesser and median wing-coverts like the back, more broadly streaked; primaries and outer secondaries brown; white-shafted and sometimes mottled on the outer web; greater coverts and inner secondaries marked with green and with broad yellowish shaft-stripes edged with black; longest tail-coverts edged with crimson; tail-feathers pale brown, almost white and edged and mottled with brown on the terminal portion; the central tail-feathers are edged with crimson throughout their length, the lateral feathers at their bases only; upper breast yellowish-green, more or less splashed with crimson; lower breast and flanks the same, with darker greener borders; abdomen dull ashy-buff, more or less covered by the lanceolate green feathers of the flanks and breast; under tail-coverts crimson with yellow specks at the tips.



Fig. 47.—Head of *L. cruentus*, ♂. ½.

Colours of soft parts. Iris red-brown or hazel; bill black; cere and gape coral-red to crimson; orbital skin scarlet to orange-vermilion; legs and spurs crimson; claws dusky (*Hume*).

Measurements. Wing 193 to 214 mm.; tail 164 to 178 mm.; tarsus about 72 to 77 mm.; culmen about 20 to 23 mm. Weight 1 lb. 1 oz. to 1 lb. 4 oz. The spurs vary from three to five and are not always the same on both tarsi.

Female. Forehead, sides of the head, chin and throat rufescent-ochre; anterior crest and nape slaty-grey, shading off into the surrounding colours; remainder of upper parts, wings and tail rufescent earth-brown, finely vermiculated all over with darker brown, more boldly on the tail and the primaries than elsewhere; outer tail-feathers more rufous and more boldly marked than the inner; lower plumage bright rufous-brown, immaculate on the fore-neck and breast, finely vermiculated elsewhere.

Cere and orbital skin carmine-yellow.

Measurements. Wing about 190 to 195 mm.

Young males are like the adult, but less brilliantly coloured and have the bill red; the orbital skin and cere are fleshy-grey.

Distribution. Northern higher ranges of mountains in Nepal, the Gogra probably forming its Western limit and East to Sikkim and West Bhutan. It is apparently common in the Chambi Valley and in Sikkim it occurs as far South as the Singalila ridge and the Damsang range North-west of Darjeeling.

Nidification. Hodgson says that the Blood-Pheasant breeds between 10,000 and 14,000 feet in April and May, laying ten to fourteen eggs in a loose nest of grass and leaves on the ground among grass and bushes. Two nests were taken by Mr. Macgregor at about 12,000 feet in Sikkim, each containing six eggs. There was no nest, the eggs being deposited in a hollow scratched in a pile of loose fallen leaves at the foot of bushes in Pine-forest. The eggs were like pale reddish specimens of those of the Grey Hen but as the birds were not captured on the nest I rejected them. From what we now know of these eggs they were certainly correct though I was doubtful at the time.

Habits. The Blood-Pheasant is a bird of the highest altitudes from just below the snow-level down to about 10,000 feet and, less often, 8,000 feet. Hodgson says that it is a common bird in Nepal, associating in small flocks feeding on insects, seeds, grain and fruits. Their alarm-note is a harsh "ship ship" and they have a peculiar cry not unlike the squeal of a Kite. They are said to be stupid birds, not shy, loth to fly and good runners. Their flesh is excellent for the table and is said to be like that of the Partridge.

(1937) Ithaginis kuseri.

THE YUNNAN BLOOD-PHEASANT.

Ithaginis kuseri Beebe, Zoologica, i, (10) p. 190 (1912) (N.W. Yunnan).

Vernacular names. *Seri* (Tibet); *Chiku* (Mishmi); *Seto* (Kong-Mo).

Description. Differs from *I. cruentus* in having the posterior ear-coverts and a broad gorget all round the crimson throat deep black; the forehead, often running back as a supercilium, crimson and both this and the crimson throat are a deeper colour than in *I. cruentus*; the breast is almost wholly crimson, the streaks of green being narrow and pointed rather than broad and spatulate and there is no pale interspace between the crimson throat and the breast; the upper parts are a purer, paler grey; the tail-feathers are more grey and less brown and with more extensive crimson edges.

Colours of soft parts. Iris yellow or light brown; orbital skin yellow, tinged with orange behind the eye; bill black, with the nostril and cere scarlet; legs scarlet; claws dark brown; spurs tipped, or wholly, black.

Measurements. Wing 197 to 210 mm.; tail 147 to 171 mm.; tarsus 55 to 60 mm.; culmen about 19 mm.

Female. Differs from that of *I. cruentus* in being darker all over. The rufous in that bird is replaced by brown and the breast is vermiculated with brown and buff; the slate-colour of the head and nape is almost black and the chestnut of the forehead and sides of the head richer.

Measurements. Wing 184 to 190 mm.

Distribution. Yunnan on the Shweli–Salwin divide; extending East to the Mishmi and Abor Hills North and East of the Dihong and Brahmapootra Rivers.

Nidification. Three fresh eggs of this bird were taken by Moorhead in the Mishmi Hills at about 12,000 feet in the beginning of May. The eggs were on the ground under a clump of bamboos, the surrounding country being then still under snow. The eggs are very like many of the genus *Lagopus*; the ground-colour orange or pinkish-buff, profusely speckled, blotched and spotted all over with rich sienna-brown, but rather more numerous round the centre of the eggs. Two of them measure 44·9 × 32·0 and 44·7 × 31·7 mm.

Habits. Similar to those of the Nepal Blood-Pheasant. Bailey found them extraordinarily common in some parts, keeping close to the snow-line and moving up and down between 8,000 and 14,000 feet as this receded or advanced. They were very tame and confiding, unwilling to fly and, when forced to do so, soon resettling. Bailey found them only in forest, more especially in that with thick undergrowth but Chatterton shot them in bamboo-jungle and in the open alongside forest in the mornings and evenings. In Yunnan they were obtained by Forrest "in bamboo thickets and alpine meadows, 12,000 feet."

(1938) Ithaginis tibetanus.

MOLESWORTH'S BLOOD-PHEASANT.

Ithagines tibetanus Stuart Baker, Bull. B. O. C., xxxv, p. 18 (1914) (Tela Range, E. Bhutan–Tibet boundary).

Vernacular names. None recorded.

Description.—Adult male. Forehead crimson, with only a trace of black round the eye; posterior ear-coverts white with narrow black edges; fore-neck pale greenish-yellow, a few feathers margined with black; the crimson on the breast is far greater in extent than in *I. cruentus*, less than in *I. kuseri*; there is much less green on the flanks and lower breast and the green on the wing is also less developed.

Colours of soft parts. Bill black; orbital skin apparently orange; legs brilliant crimson-red, soles paler, claws black.

Measurements. Wing 197 mm.; tail 176·5 mm.; tarsus 59·7 mm.; culmen 17·7 mm.

Female. Not known.

Distribution. Eastern Bhutan and South-East Tibet but the limits not yet known. Bailey thinks the birds he saw on the Pöshing Peshing-La in Mönyul were of this race.

Nidification unknown.

Habits do not differ in any way from those of the other races.

Genus **OPHRYSIA.**

Ophrysia Bonap., Comp. Rend., xliii, p. 414 (1856).

Type, *Rollulus superciliosus* Gray.

This genus contains one species about which very little is as yet known, but which is confined to the neighbourhood of Mussoorie and Naini Tal in the North-West Himalayas.

The tail is composed of ten feathers, well rounded and nearly as long as the wing; the wing is short, the first primary shorter than the tenth and the fifth or sixth longest; the bill is short and stout; the tarsus short but strong; the plumage is long, lax and lanceolate, being in these respects similar to *Ithaginis*.

The sexes are dissimilar.

(1939) **Ophrysia superciliosa.**

THE MOUNTAIN-QUAIL.

Rollulus superciliosus Gray, Knowsl. Menag. Av., pl. xvi (1846) (India, Mussoorie).
Ophrysia superciliosa. Blanf. & Oates, iv, p. 105.

Vernacular names. None recorded.

Description.—Adult male. Forehead and a broad long supercilium white, banded above and below with black; chin, throat, sides of the face and ear-coverts black; lower ear-coverts and cheeks white, extending in a broken band down the sides of the throat; a spot in front of the eye and another behind it white; crown greyish-brown with velvety-black central streaks; remainder of plumage dark slaty olive-brown, each feather edged with black on the basal three-quarters, except on the tail and longest upper tail-coverts; under tail-coverts black with broad white terminal bars; the wings are rather browner and lighter than the rest of the plumage and the primaries are vermiculated pale with dull buff on the basal halves of the outer webs.

Colours of soft parts. "Bill coral-red; legs and feet dull red" (*Hutton*).

Measurements. Wings 86 mm. (in moult) to 95 mm.; tail 80 to 82 mm.; tarsus 29 mm.; culmen 11·5 mm. Two other specimens not fully adult have wings of 85 and 86 mm.

Female. Above cinnamon-brown, the centre of the crown unstreaked, nape and neck with broad black streaks changing to triangular black spots on the back, scapulars rump and upper

tail-coverts, on all of which the feathers are bordered with fulvous, more especially on the scapulars; a small white eyebrow, and small white spots in front of and behind the eye; a broad supercilium, ear-coverts and sides of head vinaceous-brown, albescent on the chin and throat; a broad black band on either side of the crown and a black patch under the eye next the bill; wings like the back; primaries light brown, mottled with buff on the outer webs, the mottling deeper and more extensive on the inner secondaries; lower plumage pale, bright vinaceous-brown, each feather edged with chestnut and with a broad black central streak; flanks and vent vermiculated with brown and black.

Colours of soft parts. "Bill dusky red, lower mandible brightest; legs dull red; eyelids black with a small white spot at the corner" (*Hutton*).

Measurements. Two females in the British Museum have wings of 88 and 93 mm.

Young male. Like the female.

Distribution. Only known from Mussoorie and Naini Tal in the North-West Himalayas.

Nidification unknown.

Habits. This little Game-bird frequents patches of long grass and brushwood on steep hill-sides at about 5,000 and 6,000 feet, feeding principally on grass-seeds and keeping in small coveys of five or six birds. They refuse to fly until almost trodden on and are slow and heavy on the wing, pitching into the grass again after the shortest of flights. Their call is a shrill whistle.

Genus **GALLOPERDIX**.

Galloperdix Blyth, J. A. S. B., xiii, pt. 2, p. 936 (1844).

Type, *Perdix lunulata* Valenc.

The genus *Galloperdix* is most happily named, for the species it contains are undoubtedly in appearance exactly halfway between the Jungle-Fowl and the Partridge. They look much like small hens, but have rather long tails carried like those of the Partridge and not compressed. The moult is not known, so for the present I retain them in the *Perdicinæ*. The genus is confined to India and Ceylon.

The wing is short and rounded, the first primary the shortest and the fifth or sixth longest or equal; the tail consists of fourteen feathers, slightly graduated and about two-thirds to three-quarters the length of the wing; the tarsus is long and stoutly built with two, three or, rarely, four spurs, the female having one or two spurs on each leg; there is no wattle or comb as in the Jungle-Fowl but there is a naked space round the eye which, as is usual with such bare spaces, is a brighter brick-red in the breeding-season than at other times.

Key to Species.

A. Two or three spurs on each tarsus.
- *a.* Breast chiefly chestnut or rufous ... *G. spadicea*, ♂, p. 358.
- *b.* Breast buff with black spots ... *G. lunulata*, ♂, p. 362.
- *c.* Breast chiefly white ... *G. bicalcarata*, ♂, p. 363.

B. Rarely more than one spur on one leg and two on the other.
- *d.* Breast chestnut with black tips to the feathers ... *G. spadicea*, ♀, p. 358.
- *e.* Breast ochreous-brown ... *G. lunulata*, ♀, p. 362.
- *f.* Breast chestnut without black tips ... *G. bicalcarata*, ♀, p. 363.

Galloperdix spadicea.

Key to Subspecies.

- A. General colour chestnut; crown brown. . *G. s. spadicea*, ♂, p. 358.
- B. General colour bright chestnut; crown blackish ... *G. s. stewarti*, ♂, p. 360.
- C. General colour greyish-chestnut, paler everywhere ... *G. s. caurina*, ♂, p. 361.
- D. Above grey with only a faint rufous tinge ... *G. s. spadicea*, ♀, p. 358.
- E. Above rufescent-grey; darker generally. *G. s. stewarti*, ♀, p. 360.
- F. Above very pale with no rufous tinge .. *G. s. caurina*, ♀, p. 361.



Fig. 45.—Head of *G. s. spadicea*, ♂. ½.

(1940) Galloperdix spadicea spadicea.

THE RED SPUR-FOWL.

Tetrao spadiceus Gmelin, Syst. Nat. i. pt. 2, p. 759 (1789) (Madagascar, in errore; Nilgiris).
Galloperdix spadiceus. Blanf. & Oates, iv, p. 106 (part.).

Vernacular names. *Chota Jungli Murghi* (Hind., Cen. Pro.); *Chakotri*, *Kokatri* (Mahr., Syhadri Range); *Kustoor* (Mahr., Deccan); *Sarawa Koli* (Tam.); *Yerra-kodi*, *Jita-kodi* (Tel.).

Description.—Adult male. Forehead sandy-buff or brown; crown and nape dark brown shading into pale brown on the hind-neck; upper back and scapulars rufous-chestnut, each feather margined with pale greyish-brown; lower back, rump and upper tail-coverts chestnut, finely vermiculated with broken bars of black; visible portions of tail the same but the inner

webs blackish on all but the central pair of rectrices and almost entirely black on the outermost; lesser wing-coverts like the upper back; median and greater coverts and inner secondaries like the lower back; quills dark brown, the secondaries with chestnut-brown mottlings on the outer webs; chin whitish-brown grading into silvery-brown on the cheeks, ear-coverts and sides of the throat; breast, flanks, and abdomen above vent chestnut-buff; thighs, vent, and posterior flanks dull brown; under tail-coverts brown or chestnut-brown, vermiculated with black.

Occasionally individuals of all ages and races have a few of the breast-feathers centred with grey.

Colours of soft parts. Iris yellow to hazel-brown; naked skin round the eye brick-red; bill horny-brown, reddish at the base and paler on the lower mandible; legs reddish-brick or reddish-brown, sometimes reddish-yellow or with a faint greenish tinge.

Measurements. Wing 145 to 166 mm.; tail 123 to 147 mm.; tarsus 48 to 52 mm.; culmen about 20 mm.

Female. Forehead sandy-brown; crown and nape blackish-brown; neck dark brown; back, scapulars and wing-coverts grey or sandy, rarely with a faint rufous tinge, each feather with two bold bars of black; rump and upper tail-coverts less black and more rufous; tail blackish; the central tail-feathers with mottled bars of buff or rufous, decreasing until they form merely a mottled edge on the outermost; chin and throat almost white, changing to dirty pale brown on the fore-neck; breast and flanks rather pale chestnut-rufous, each feather with a terminal band of black, less conspicuous towards the vent; posterior flanks mottled, as well as barred, with black; vent and under tail-coverts dull brown, the latter mottled with black and rufous or sandy.

Orbital skin duller than in the male, sometimes more greenish-brown.

Measurements. Wing 134 to 163 mm.

Young males are like the females but more richly and deeply coloured, with more black in proportion to the buff and rufous.

Distribution. The Terai from Western Nepal to Goruckpore; the better-wooded tracts of Central India from Saugor to Rajmehal and Nya Dumkah; South of this it occurs in suitable country in Central India, Orissa and Madras and as far South-West as Mysore, North Coimbatore and the Palni Hills; the birds from the Bombay Presidency South of Rajputana and Mahableshwar are nearer this form than to *caurina*. Malabar birds and those from the North coast of Travancore are intermediate between *spadicea* and *stewarti* but nearer the former.

Nidification. The Red Spur-Fowl breeds throughout its range from the broken country in the plains up to the tops of the Nilgiris and other Hills of Southern India. Most eggs appear to be laid in January and February but they breed practically throughout

the year, except perhaps in the three months October to December. The eggs are laid on the ground with no nest beyond a hollow scratched in the earth, in which may, or may not, be a few leaves or a little grass. The favourite breeding-places are bamboo- and scrub-jungle but many nests may be found in forest. Three or four eggs undoubtedly form the normal clutch and most often the former. Occasionally more, even up to seven, eggs may be laid; sometimes these are, however, the layings of two birds and anything over five is exceptional. In appearance they are small, buff-coloured, rather long miniatures of those of the Barn-door Fowl, varying from pale whitish-fawn to a fairly deep buff. Forty eggs average 40·4 × 29·5 mm.: maxima 42·9 × 32·0 and 43·0 × 32·6 mm.; minima 37·6 × 28·2 and 41·4 × 28·0 mm. An egg in the Hume collection measures 46·9 × 36·3 mm. and is probably a small egg of some fowl.

Spur-Fowls, including this species, all seem to be monogamous, the cock assisting the hen in caring for the young and, probably also, in the work of incubation.

Habits. This Spur-Fowl is not at all particular as to what kind of jungle or forest it frequents so long as there is ample cover; scrub, bamboo-jungle and deciduous thin forest are its favourites, and in these it wanders about in small parties, probably a pair with their last brood, feeding on any insects, worms, beetles, grain, seeds, berries etc. which come their way. In their actions they are very like bantam hens but not quite so fussy, turning over the leaves and rubbish with their feet far more slowly than the bantams do. They are poor fliers and very hard to flush without dogs and even when forced to rise fly no distance, and soon pitch headlong into the jungle again. When disturbed they utter a chuckle like a frightened fowl and they have numerous chuckling conversational notes, whilst the cock in the breeding-season has a crow not differing much from their calls of fright. Their flesh is excellent for the table, white and not too dry.

(1941) Galloperdix spadicea stewarti.

THE TRAVANCORE RED SPUR-FOWL.

Galloperdix spadicea stewarti Stuart Baker, Bull. B. O. C., xl, p. 18 (1919) (Aneichardi, Travancore).
Galloperdix spadicea. Blanf. & Oates, iv, p. 106 (part.).

Vernacular names. *Saravoo Koli, Chakutti-Koli* (Tam., Travancore).

Description.—Adult male. Similar to *G. s. spadicea* but much more richly coloured; the crown is almost black and the whole of the upper parts are a bright chestnut-rufous, the pale borders to the feathers being absent or obsolete, the vermiculations on the lower back entirely absent and on the rump and upper tail-coverts almost so; below, the chestnut is very rich and extends to the vent.

Colours of soft parts as in the preceding bird.

Measurements. Wing 145 to 161 mm.

Female differs from that of the typical form in being much more richly and brightly coloured.

Measurements 148 to 150 mm.

Distribution. Central and South Travancore only, between the foot-hills and 4,000 feet.

Nidification. This race breeds principally from January to March but Davidson found eggs as late as August. They breed from the foot-hills up to about 3,500 feet but the great majority of birds between 1,500 and 2,500 feet. The normal full clutch of eggs is three. Thirty-six eggs average 41·3 × 30·4 mm.: maxima 42·3 × 30·1 and 40·8 × 31·3 mm.; minima 38·1 × 29·2 and 39·0 × 28·7 mm.

Habits. Those of the species. They appear, however, to be more frequenters of evergreen-forest than the other races are.

(1942) Galloperdix spadicea caurina.

THE ARAVALLI SPUR-FOWL.

Galloperdix spadicea var. *caurina* Blanf., Avif. B. I., iv, p. 107 (1898) (Mt. Abu).

Vernacular names as in *G. s. spadicea*.

Description.—Adult male. Differs from the adult male of the typical form in being everywhere much paler; on the upper parts the chestnut centres to the feathers are much paler and the grey margins wider; below also the tint is much paler.

Colours of soft parts. Iris light brown; bill dusky reddish; legs and feet coral-red (*G. King*).

Measurements. Wing 153 to 173 mm. Weight 8½ to 10 oz. (*G. King*).

Female much paler both above and below than the female of the Common Red Spur-Fowl; the black markings are almost absent; below the chestnut is much paler and the feathers are edged with paler grey, whilst the black markings are greatly reduced.

Measurements. Wing 154 to 171 mm. Weight 8 oz. (*G. King*).

Distribution. The Aravalli Hills and Udaipur only. Birds from the Bombay Presidency immediately south of Mt. Abu are decidedly darker than the birds of these hills and, though intermediate, are nearer to *G. s. spadicea* than to *G. s. caurina*.

Nidification. Dr. King and Col. Butler found this bird breeding in numbers in the Aravalli Hills in May and June. Except that they breed in thinner jungle, the nidification differs in no way from that of the other races.

Habits. Similar to those of the other races but this bird lives in an area of short rainfall and frequents thin deciduous forest and brushwood rather than dense jungle and evergreen-forests.

(1043) Galloperdix lunulata.

THE PAINTED SPUR-FOWL.

Perdix lunulata Valenc., Dict. Sci. Nat., xxviii, p. 446 (1825) (Bengal).
Galloperdix lunulata. Blanf. & Oates, iv, p. 108.

Vernacular names. *Askol* (Orissa and Singbhoom); *Hootkah* (Gondi); *Cull-koli* (Tam.); *Jitta-kodi* (Tel.).

Description.—Adult male. Crown black, glossed with green and spotted with white, the spots sometimes with black centres; chin dull or buffy-white slightly spotted with black; rest of head, neck and extreme upper back brownish-black, each feather with a white terminal and glossy black subterminal bar; remaining upper parts and wing-coverts rich chestnut with white, black-edged ocelli, absent or obsolete on the rump and upper tail-coverts; inner wing-coverts with a strong metallic-green gloss and the corners with ocelli larger than those on the back; longer upper tail-coverts and tail brownish-black, the latter with a faint green or purple gloss; under lesser wing-coverts chestnut with black and white bars; greater coverts brown faintly edged with chestnut; breast and upper abdomen bright buff, each feather with a terminal spot of black; flanks chestnut with buffy-white bars enclosed by black ones; lower abdomen, vent and under tail-coverts brownish chestnut, spotted with small black-edged spots; under tail-coverts black-tipped.

Colours of soft parts. Iris hazel to dark brown: bill horny-black, paler on the lower mandible, gape and base; legs and feet greenish or plumbeous-horny.

Measurements. Wing 144 to 161 mm.; tail 128 to 135 mm.; tarsus 42 to 45 mm.; culmen about 19 mm. Spurs up to 25 or 26 mm., generally two on each leg, sometimes three on one or both. Weight 9 to 10 oz. (*Hume*).

Female. Crown black with chestnut stripes, the latter occupying most of the forehead; the posterior crown with chestnut tips to the feathers also; broad supercilia chestnut with paler streaks; ear-coverts deeper chestnut; chin, throat and cheeks pale yellowish-buff, mottled with chestnut; upper parts dark brown, tinged with greyish-olive on the back, scapulars and lower wing-coverts; upper wing-coverts darker and browner; tail deeper, richer brown, obsoletely rayed with black; breast and upper flanks pale rufescent brown becoming earthy-brown on the abdomen, vent and under tail-coverts.

Measurements. Wing 138 to 159 mm. Weight 8 to 9 oz. (*Hume*).

Young males resemble the female but are duller; the upper plumage is much freckled and barred with dull black and rufous-brown; below, the colour is a more earthy-brown and much freckled with buff.

Chick in down. Above, light chestnut-rufous, the head and a broad dorsal line darkest; below, dull pale earthy-brown, more chestnut on the throat, breast, thighs and vent.

Distribution. Almost the same as that of *G. spadicea*. Roughly on the North its boundaries are the Sind, Jumna and Ganges Rivers; westwards it is found as far as the eastern slopes of the coastal ranges, but not on the coasts of Malabar and Travancore. East it extends to the coast wherever the country is suitable.

Nidification. The breeding-season is apparently from February to June, most birds laying in April and early May. They lay their eggs in scrapes made by themselves in any kind of cover and generally protected by a rock, fallen tree or a bush. The normal clutch is three, occasionally two or four and very rarely five. They cannot be distinguished from those of other Spur-Fowl and twenty-five average 40·9×29·3 mm.: maxima **42·4**×28·4 and 42·9×**31·0** mm.; minima **39·7**×28·3 and 41·2×**27·0** mm.

Habits. The Painted Spur-Fowl does not seem to mind much what kind of jungle it frequents but does prefer such as grows in broken rocky country. It is not a bird of high elevation and few are to be found over 3,000 feet. Pitman says that when frightened these birds take to trees but that they are not hard to flush once. When first disturbed they always run up hill and then when forced to fly hurl themselves down the sides of the hill with considerable speed. They feed on all kinds of grain, insects etc. and are very fond of the flowers of the Mowah trees.

(1944) Galloperdix bicalcarata.

THE CEYLON SPUR-FOWL.

Perdix bicalcaratus Forst., Ind. Zool., p. 25, pl. 14 (1781) (Ceylon).
Galloperdix bicalcarata. Blanf. & Oates, iv, p. 109.

Vernacular names. *Haban* or *Saban-kukula* (Cing.).

Description.—Adult male. Upper plumage black with narrow white streaks, narrowest on the head, pear-shaped on the wing-coverts; the bases of the feathers of back and wing-coverts are chestnut-brown, vermiculated with black; feathers of the lower back and greater wing-coverts have broad chestnut edges vermiculated with black, grading into the chestnut rump and shorter upper tail-coverts; rump-feathers with a terminal black spot or narrow bars of buff and black, sometimes also with a little black vermiculation; longer tail-coverts and tail black, the central tail-feathers sometimes and the bases of the lateral feathers always vermiculated with chestnut; primaries and secondaries brown, the latter vermiculated with chestnut on the outer webs and the innermost on both webs; greater coverts brown with white, pear-shaped ocelli, edged with black at the tips; feathers of sides of head white edged with black; chin and throat pure white; neck,

breast and abdomen white, each feather edged with black, very broad on the flanks; centre of the abdomen almost white; vent, posterior abdomen and flanks dull earthy-brown with white spots; under tail-coverts blackish-brown with grey tips.

Colours of soft parts. Iris brownish-yellow or brownish-red; orbital skin red; bill, legs and feet red; spurs dusky-reddish (*Legge*).

Measurements. Wing 157 to 174 mm.; tail 121 to 130 mm.; tarsus 54 to 57 mm.; culmen about 22 mm.; spurs up to 20 mm., generally 12 to 15 mm.

Female. Crown blackish-brown, the feathers of the forehead and sides with paler centres; sides of the head dull chestnut, the feathers black-edged; whole upper plumage and wing-coverts dull chestnut vermiculated with black, most profusely so on the upper tail-coverts; tail black, the central feathers slightly vermiculated with chestnut; quills like those of the male; below chestnut, immaculate on the breast, more and more vermiculated with dark brown towards the vent; vent, posterior abdomen and flanks earthy-chestnut; under tail-coverts darker chestnut, densely vermiculated with black.

Colours of soft parts. Iris brownish-yellow; bill, legs and feet lighter red than in the male (*Legge*).

Measurements. Wing 143 to 150 mm. Most females have one or two spurs on both legs; in some they are missing on one leg.

Distribution. Ceylon only.

Nidification. The Ceylon Spur-Fowl breeds almost throughout the year, the principal seasons being November to April and again in July and August. The site selected is always in thick cover and the birds seem to prefer evergreen-forest to any other kind of jungle. No nest is made, the eggs being laid in some hollow in the ground, well screened from view. The normal clutch is two eggs only, sometimes three and four quite exceptionally. There is no authentic record of their laying more than this number. They are like other Spur-Fowls' eggs, pale fawn to a warm buff. Eighteen eggs average 40·6 × 29·7 mm.: maxima **42·1 × 30·4** mm.; minima **38·0** × 28·4 and 39·4 × **28·3** mm.

Habits. The Ceylon Spur-Fowl is found at all heights from the foot-hills and broken ground adjacent to them, up to 5,000 feet or higher. Wait says it is also found in "the dry, flat country between the hills and the sea" on the East. It keeps closely to dense cover and is such a skulker that even where common is seldom seen, though its cackling cries may often be heard. Once it can be forced to fly it is said to be strong and fairly swift on the wing, apparently excelling its Indian relations in this respect. Although monogamous, the cocks are great fighters, a failing which renders them easy to decoy and snare.

Genus BAMBUSICOLA.

Bambusicola Gould, P. Z. S., 1862, p. 285.

Type, *Perdix thoracica* Temm.

This genus seems appropriately placed by Blanford between *Galloperdix* which it closely resembles in structure and *Aborophila* which it is very much like in coloration and appearance.

The tail is of fourteen feathers, is equal to more than three-quarters the wing in length and is well graduated; the wing is well rounded, the fifth primary longest, the second equal to the tenth and the first much shorter; the tarsus is long and strong and furnished with spurs, sometimes in the female also: the claws are of moderate length and slightly curved like those of *Francolinus*.

Sexes alike.

The genus ranges from Assam, through Northern Burma to China and Formosa. Only one species occurs within our limits.

Bambusicola fytchii.

Key to Subspecies.

A. Crown more brown, less rufous; black spots on rump and upper tail-coverts absent or obsolete ..... *B. f. fytchii*, p. 365.

B. Crown more rufous, less brown; black spots on rump and upper tail-coverts well developed and numerous ..... *B. f. hopkinsoni*, p. 366.

(1945) Bambusicola fytchii fytchii.

THE YUNNAN BAMBOO-PARTRIDGE.

Bambusicola fytchii Anderson, P. Z. S., 1871, p. 214 (Ponsa, Yunnan); Blanf. & Oates, iv, p. 110 (part.).

Vernacular names. *Dao-hui-lai* (Cachari).

Description. A broad supercilium to the nape white or rufescent-white; a broad line from the eye below this black, often mixed with rufous and sometimes nearly entirely of this colour; fore-head, lores, cheeks and ear-coverts rufous-buff; crown and nape rufous-brown, the feathers with obsolete paler edges; hind-neck pale grey-brown broadly streaked with chestnut, forming a fairly definite collar; upper back, scapulars, coverts and inner secondaries grey, obsoletely rayed darker and with broad dark chestnut streaks terminating in a black spot; rump and upper tail-coverts vermiculated grey and grey-brown, the latter occasionally with a little white vermiculation and here and there a small black central streak; central tail-feathers grey-brown, more or less suffused with chestnut and irregularly barred with broken bars of fulvous-buff, each succeeding pair less mottled and barred and more chestnut; primaries and outer secondaries chestnut-brown; chin,

throat and fore-neck pale rufous-buff; breast chestnut, the feathers with white terminal spots and grey semi-edges; remainder of lower parts white, more or less tinged with buff and with broad black bands, often joining on the sub-edge of the feathers of all but the vent and centre of the abdomen, which are unspotted and more buff.

Colours of soft parts. Iris golden-hazel; bill horny-brown; legs and feet dull greenish-brown or greenish-grey.

Measurements. Wing 136 to 152 mm.; tail 85 to 112 mm.; tarsus about 44 to 48 mm.; culmen about 18 to 20 mm.

Distribution. Kachin Hills, North and South Shân States, Yunnan and Setchuan.

Nidification. Similar to that of the next bird. Thirty eggs average 39·1 × 29·7 mm.: maxima **41·0** × 30·0 and 38·3 × **30·7** mm.; minima **36·1** × 29·1 and 38·3 × **28·1** mm. They cannot be distinguished in any way from that of *B. f. hopkinsoni*. The breeding-season seems to be from May to the end of July. Forrest found them common in Yunnan between 7,000 and 10,000 feet but in the Kachin Hills and Shan States they certainly breed as low as 5,000 feet and rarely as low as 3,500 feet.

Habits. This bird seems to be more of a forest and thick-cover bird than the Assam form. All Rothschild's specimens from Yunnan were apparently obtained in "forests and thickets," whilst Harington and Cook also obtained it in the Shan States both in forest and in bamboo-jungle and grass-lands. In flight, voice, food etc. it differs in no way from the next race.

(1946) **Bambusicola fytchii hopkinsoni.**

THE ASSAM BAMBOO-PARTRIDGE.

Bambusicola hopkinsoni Godw.-Aust., P. Z. S., 1874, p. 44 (Khasia Hills, Assam).
Bambusicola fytchii. Blanf. & Oates, iv, p. 110 (part.).

Vernacular names. None recorded.

Description. Differs from the preceding race in being more rufous, less brown, on the crown and nape and in having the black central markings on the rump and upper tail-coverts much more developed and often extending on to the back; the white specks and spots on the back and wing-coverts are also more numerous and sometimes larger.

Colours of soft parts. Iris hazel or yellow-hazel; bill dark horny-brown, paler at the tip and on the lower mandible; legs and feet greenish-brown.

Measurements. Wing 141 to 156 mm.; tail 85 to 112 mm.; tarsus about 44 to 47 mm.; culmen about 18 to 20 mm.

Distribution. Hills South of the Brahmapootra from Cachar and Sylhet, the whole of the Patkoi range to Lakhimpur; Manipur, Lushai Hills, Chin Hills and Northern Arrakan Yomas.

Nidification. The Assam Bamboo-Partridge breeds at all levels from 1,500 to 5,000 feet very commonly throughout its range. A few birds breed here and there down to the level of the plains, whilst in the Naga Hills and Patkoi range they may be found up to 7,000 feet. They commence to lay in April and continue until the end of July, whilst I have seen eggs as late as September and as early as March. No real nest is made but the birds usually collect a good deal of rubbish, leaves, grass etc. to fill the hollows they select or scratch out for their eggs. The place selected is generally in grass-land, sometimes in bamboo-jungle and but rarely in scrub or forest. When in grass-land they are difficult to detect, for the grass is anything from three to five feet high, but when in bamboo-jungle they are sometimes quite exposed yet equally difficult to find, for the eggs are exactly the colour of the bamboo-leaves on which they lie. The full clutch is four or five, sometimes three to seven, the latter exceptional. The colour is a pale to warm buff and the eggs are distinguishable from all other Game-birds' eggs by the extraordinarily thick hard shell. Two hundred eggs average 40·2 × 29·6 mm.: maxima **41·8** × 29·9 and 40·0 × **32·0** mm.; minima **26·4** × 27·9 and 38·6 × **27·0** mm.

The cock-bird is monogamous and keeps with the hen whilst incubating and looking after the chicks. The hen is a very close-sitter, and many nests which would otherwise never be noticed are found by her fluttering off them at the last moment.

Habits. This Partridge is extremely common in all patches of grass-land, especially such as have bamboo-jungle or other cover close at hand. They frequently choose steep hill-sides, covered with grass two or three feet high, a stream near the bottom and pine-forest near the top. Here all through the breeding-season their loud, cheerful call, "chi-chirree; chi-chirree; chiree, chiree, chiree," may be heard morning, noon and night. The cock-bird utters his challenge seated on a stump or mound and at the beginning of the breeding-season the females also attempt to crow. They roost at night on low boughs of pines or in bamboo-clumps, but nearly always at the edge of the jungle and not inside it. They feed on insects, worms, coleoptera etc. and on all kinds of berries, seeds and grain. Their flesh is dry but white and tender, and as they are fairly easy to flush one can often get a morning's sport with them worth having, even if no big bags are attainable.

Genus **ROLLULUS**.

Rollulus Bonn., Tabl. Encycl. Meth., i, introd., p. xciii (1790).

Type, *Phasianus roulroul* Scop.

This genus contains but a single species, remarkable for its bright green colour. There is a thick occipital crest of bristly red feathers; both sexes have a tuft of hair-like bristles from the middle of the forehead; the tarsus is longer than the middle toe

and claw, the hind toe is rudimentary or wanting; the wing is well rounded, the first and tenth primaries about equal, and the fifth longest or fourth and fifth subequal; the tail of twelve soft feathers is rounded and just a little longer than half the wing.

Sexes not alike.

(1947) Rollulus roulroul.

THE GREEN WOOD-QUAIL.

Phasianus roulroul Scop., Del. Flor. et Faun., Insubr., ii p. 90 (1786) (Malacca).

Rollulus roulroul. Blanf. & Oates, iv, p. 111.

Vernacular names. None recorded.

Description.—Adult male. Crest coppery to purplish-red; a broad white band across the head from eye to eye; tuft and remainder of head and neck black; upper parts rich green glossed with blue; tail and longest upper tail-coverts black; lesser wing-coverts rufous-brown; median and greater coverts darker brown; quills dark brown, mottled on the outer webs with rufous-buff; below black, the breast glossed with blue.

Colours of soft parts. Iris slaty-grey; bill black, scarlet on the base and gape; facial skin, legs and feet red, more scarlet in the male.

Measurements. Wing 131 to 146 mm.; tail 57 to 63 mm.; tarsus 41 to 43 mm.; culmen about 15 to 17.

Female. Crown, incipient crest and whole head dark slaty-grey; upper and lower plumage grass-green, paler and tinged with grey on the abdomen and vent; scapulars and lesser wing-coverts chestnut, median and greater coverts paler chestnut with blackish bars; tail black; primaries and secondaries as in the male.

Colours of soft parts. Iris brown.

Measurements. Wing 137 to 142 mm.

Distribution. Tenasserim and South-West Siam South to Sumatra and Borneo. It is very doubtful if this species occurs in Java, although there are three specimens in the British Museum alleged to have come from that island.

Nidification. Nothing recorded. A hen of this species in the aviaries of C. M. Inglis laid four eggs, pure white, of a fine close texture and in shape a rather pointed oval. They were laid on the 21st to 25th April and measure about 36·0 × 28·0 mm.

Habits. This quaint little Partridge is a forest-bird, moving about in dense cover in small parties of six to ten, feeding on insects, seeds, berries and shoots. Their call is a soft mellow whistle and in Tenasserim, on the Little Tenasserim River, Hopwood says this call was continuously heard, the birds being very common though difficult to see, as they were such confirmed skulkers and runners. The natives considered them very stupid birds and extremely easy to trap.

Genus EXCALFACTORIA.

xcalfactoria Bonaparte, C. R., xlii, p. 891 (1856).

Type, *Tetrao chinensis* Linn.

This genus is very close to *Coturnix* but, whereas in that genus the sexes are very nearly alike in *Excalfactoria* whilst the female is very like *Coturnix*, the male is an extremely handsome little bird of striking colours.

The tail has only 8 feathers, short and soft, as against 10 or 12 in *Coturnix*; the wing is rather short but not much rounded, the first primary a little shorter than the second and the third the longest; the tarsi are fairly strong but have no spurs.

Excalfactoria chinensis.

Key to Subspecies.

A. Rather paler; back of male not suffused with blue-grey and having pale shaft-stripes ..... *E. c. chinensis*, p. 369.

B. Rather darker; back of male suffused with blue-grey but having no pale shaft-stripes ..... *E. c. trinkutensis*, p. 371.



Fig. 46.—Head of *E. c. chinensis*, ♂. ½.

(1948) Excalfactoria chinensis chinensis.

THE BLUE-BREASTED QUAIL.

Tetrao chinensis Linn., Syst. Nat., 12th ed., i, p. 277 (1766) (China).
Excalfactoria chinensis. Blanf. & Oates, iv, p. 112.

Vernacular names. *Khair-butai*, *Kaneli* (Nepal); *Gobal-butai* (Oude); *Ngon* (Burm.); *Pandura-watuwa*, *Wenella-watuwa* (Cing.); *Daobui-majungbi* (Cachari); *Shorbol* (Manipuri).

Description.—Adult male. Lores, supercilium, forehead, sides of head and neck slaty-grey; centre of crown and nape rufous-brown with broad concentric black bars; back, rump and upper tail-coverts rufous-brown, with grey edges and broad black bars; the feathers of the centre of the crown and back have central white streaks broadest in young birds, obsolete or absent in the oldest; tail-feathers slaty-blue edged with chestnut and nearly all of the latter colour in old birds; wings fulvous-brown, much

suffused with slaty-blue and more or less marked with rich chestnut on the inner secondaries and greater coverts; a line under the lores to the eye white and another from the angle of the mouth to the posterior ear-coverts black; below this again white; chin and throat black, the black produced in a line upwards round the white to join the upper black line; fore-neck white, edged with black; upper breast and flanks slaty-blue, this colour often running up and encroaching on the sides of the neck and back; centre of breast, abdomen and under tail-coverts deep chestnut.

Colours of soft parts. Iris bright vermilion-red to deep crimson; rarely a bright vinous-pink; bill black, the edge, gape and gonys slaty; legs and feet bright yellow, soles paler and claws brownish.

Measurements. Wing 65 to 78 mm.; tail about 25 mm.; tarsus 20 to 22 mm.; culmen 10 to 11 mm. Weight 1½ to 2 oz.

Female. Above like the male but with no slaty markings; the white streaks are broader and the black markings rather smaller; the slaty-blue on the head is replaced by rufous; chin and throat fulvous-white; remainder of lower plumage pale buff, the fore-neck, breast and flanks barred with black; the tail is brown with buff and black markings.

Colours of soft parts. Iris brown.

Measurements. Wing 66 to 77 mm.

Young male is like the adult with no blue or chestnut above; there are broad buff centres to the feathers of the rump and upper tail-coverts; the slaty-blue of the underparts is duller and barred with black on the sides of the head and neck and the chestnut is restricted to the centre of the abdomen or wanting altogether.

Young male in first plumage like the female but paler and more rufous in general tint. Iris glaucous-brown or blue.

Chick in down. Coronal streak and one on either side of the crown buff; tips of the wing, sides of the head, chin and throat buff; remaining plumage brown, darker above, paler below.

Distribution. Practically all India and Ceylon in suitable country and all Burma. It is a common breeding-bird in Travancore and the Malabar coast to Bombay; it is rare in Madras and South-East India, becomes more common in North Orissa, Eastern Bengal and Behar and is very common in Assam and Western Burma. It is rare or absent from the North-West of India, West of a line drawn from Bombay to Simla. Outside India it ranges East through the Indo-Chinese countries to China and Formosa and South into the Malay Peninsula. Allied races extend as far as Australia.

Nidification. The time of this little Quail's breeding varies greatly according to locality. In Ceylon the principal months are February and March and September and October; in Southern India February to April; in Northern India and Assam June and July; in Burma January and again in June and July and in the Malay Peninsula January to March. It breeds, however, at odd

times practically throughout the year and for Assam there are records of eggs in every month. They breed in the plains and in the hills up to 7,000 feet (Kohima) and quite commonly up to 5,000 feet. The nest is a mere scrape in the earth lined with a little grass, a few leaves or pine-needles or not lined at all. Nine out of ten are made in grass-lands, a few in bamboo- or scrub-jungle. The eggs number four to seven, very rarely eight, and vary in colour from a pale yellowish or olive-clay to a warm olive or pure brown. Most eggs are unmarked but a few are stippled lightly and sparsely with darker freckles. One hundred eggs average 24·5×19·0 mm.: maxima 27·7×18·5 and 25·3×20·4 mm.; minima 22·9×17·3 mm.

Habits. Hume considered this Quail to be migratory over most of its range but certainly in Bengal, Assam and Northern Burma it is resident all the year round. In Ceylon and Travancore it is also resident and probably the same everywhere else. They prefer grass-lands to all other places but seem equally at home in elephant-grass and reeds of enormous height growing in swampy places. They also haunt bamboo- and thin scrub-jungle, never forest. They are shy little birds, wandering about in small coveys and often venturing on to jungle-paths to hunt for seeds berries and insects; on the slightest alarm, however, they scuttle into cover and will not appear again for a long time. When flushed they utter a quiet "tir-tir-tir" but the call-note to the male or young is a sweet double whistle sounding like "ti-yu, ti-yu."

(1949) Excalfactoria chinensis trinkutensis.

THE NICOBAR BLUE-BREASTED QUAIL.

Excalfactoria trinkutensis Richmond, Proc. Nat. Mus. U.S., xxv, p. 310 (1902) (Trinkut Is., Nicobars).
Excalfactoria chinensis. Blanf. & Oates, iv, p. 112 (part.).

Vernacular names. *Mul* (Car Nicobar).

Description.—Adult male. Differs from the preceding race in having the pale shaft-streaks on the upper plumage obsolete or wanting; the back is much suffused with the blue-grey of the breast and they are also, generally speaking, much darker.

Colours of soft parts. "Iris crimson; bill bluish-horny; legs orange, claws black" (*Butler*).

Measurements. Wing 69·5 mm.; tail 14·0 mm.; tarsus 13·5 mm.; culmen 10 mm.

Female differs from *E. c. chinensis* in being more darkly and richly coloured; the ground-colour of the upper plumage is grey rather than brown and the underparts are completely barred.

Colours of soft parts. Iris brownish-red; bill dusky bluish; legs yellow to orange, claws brown.

Measurements. Wing 65 mm. Butler gives the wing of a female as 69 mm.

Distribution. Car Nicobars, Trinkut Is. and Camorta.

Nidification. Unknown.

Habits. Butler and Richmond found this little Quail common in open grass-lands but very hard to flush.

Genus COTURNIX.

Coturnix Bonn., Tabl. Encyl. Méth., i, pp. lxxxvii, 216 (1791).

Type, *Tetrao coturnix* Linn.

The present genus contains the true Quails, migratory or semi-migratory birds with comparatively long and pointed wings, the first primary longest or the first and second subequal; the tail is short and consists of ten or twelve feathers; the bill is small and slender; the tarsus strong but not very long and without spurs; the sexes differ slightly in coloration.

The genus is found throughout the Eastern Hemisphere, including Australia and New Zealand, two species occurring within our limits.

Key to Species.

A. Outer webs of primaries barred with buff	*C. coturnix*, p. 372.
B. Outer webs of primaries unbarred	*C. coromandelica*, p. 375.

Coturnix coturnix.

Key to Subspecies.

A. Chin black	*C. c. coturnix*, ♂, p. 372.
B. Chin not black	*C. c. japonica*, ♂, p. 374.
C. Feathers of chin normal	*C. c. coturnix*, ♀, p. 372.
D. Feathers of sides of chin lengthened, bristly and pointed	*C. c. japonica*, ♀, p. 374.

(1950) Coturnix coturnix coturnix.

THE COMMON OR GREY QUAIL.

Tetrao coturnix Linn., Syst. Nat., 10th ed., i, p. 161 (1758) (Sweden).
Coturnix communis. Blanf. & Oates, iv, p. 114 (part.).

Vernacular names. *Bhater*, *Burra bhater*, *Gagus Bhater* (Hind., Upp. Ind.); *Buttaira*, *Butteyra* (Sind); *Bhutri* (L. Beng.); *Gundri* (Oonah); *Soipol* (Manipur); *Daobui-kashiba* (Cachari); *Bota-sorai* (Assam); *Ngon* (Burma); *Lorva* (Ratnagiri); *Burra Ganga* and *Burgangi*, *Gurganj* (Poona, Saltara); *Barli* (Belgaum); *Gogari-yellichi* (Tel.); *Peria-ka-deh* (Tam.); *Sipali-hake* (Can., Mysore); *Badina* (Turki); *Watwalak* (Kashgar).

Description.—Adult male. A few streaks on the forehead, lores, a broad coronal streak and supercilia buff; feathers of crown to hind-neck black with broad terminal bars of brown, almost concealing the black; back, rump and upper tail-coverts light brown with narrow, wavy, rufous-buff bars bordered with brown and with buff streaks; scapulars and wing-coverts like the back but with the rufous and black patches almost concealed, the central buff streaks broader and edged with black; the wing-coverts also have numerous pale bars; quills light brown, the first primary with a very pale buff or whitish outer web; the remaining quills barred on the outer webs with buff and brown, the innermost secondaries with some buff bars and blackish markings on both webs; tail blackish-brown with buff bars and streaks; a narrow line from the gape and above the ear-coverts dark brown, produced as far as the end of the supercilium; centre of chin to throat blackish-brown with a broad band of the same colour across the throat to the ear-coverts and a second, similar but narrower, band lower down; between the bands and the centre of the throat a dark creamy-buff line; breast rufous-buff with glistening pale buff shaft-streaks; flanks brown with broad black-edged pale streaks and suffused with rufous; abdomen and lower tail-coverts creamy-white to pale buff.

Colours of soft parts. Iris bright hazel to deep brown; bill bluish, greyish or brownish horny, darker on tip and culmen; legs and feet pale fleshy to fleshy-brown or light brown.

Measurements. Total length about 180 to 200 mm.; wing 100 to 117 mm.; tail 36 to 39 mm.; tarsus about 30 mm.; culmen about 12·5 to 13·5 mm.

Female differs from the male in having the centre of the chin and throat creamy-buff; the two dark gorgets are narrower and broken in the centre; the breast is spotted with black, profusely in the young, less in older birds and even absent in a few very old individuals.

Young birds are like the female but duller.

Chick in down. Crown rufous-brown; a broad central black streak from the anterior crown, bifurcating on the posterior crown and nape, enclosing a buff central patch; back rufous-buff with a broad black central streak; wings buff with black patches; below pale fulvous.

Distribution. Central and South Europe; North Africa; North and Central Asia to Lake Baikal, South to Arabia, Persia, Afghanistan, Baluchistan and North-West India, breeding birds occurring East to Purnea Mymensingh and Manipur and South to Sattara in the Bombay Presidency and Hoshangabad in the Central Provinces. In the Winter it wanders South to Madras and Travancore. It has also been frequently recorded from Burma but, though it may occur there, most of these records refer to the next race.

Nidification. A great number of Common Quails are resident and breed over the greater part of their Indian habitat. Eggs have been taken from Sind in the West to Cachar in the East and South to the Deccan. Perhaps March and April are the favourite laying-months but Jennings, Betham and Osmaston found many nests in July, August and September and in fact they may be seen occasionally in any month from February to October. The nest is just a hollow scratched in the ground in grass-fields, growing crops etc., generally fairly well hidden. In Kashmir it is very common breeding round the lakes in long grass and fields of crops at elevations between 4,000 and 6,000 feet. The eggs number 8 to 14 and vary extraordinarily in colour and character of markings. The ground varies from palest creamy to a warm buff, reddish-brown or yellow stone-colour. In some eggs the whole surface is covered with innumerable specks and freckles of dark brown; in others these freckles are fewer and are intermixed with a few small spots and blotches; in others there are no freckles and the blotches are very large, bold and almost black; in others again the freckles are so tiny and pale that at a little distance the eggs look pale clay-yellow, brownish-grey, or olive-brown. Between these variations there is every degree of intermediate coloration. One hundred Indian eggs average 29·7 × 22·8 mm.: maxima **33·0** × 23·6 and 32·0 × **25·0** mm.; minima **27·1** × **19·1** mm.

Habits. Although many thousand of these Quails are resident, the vast millions which are seen during the cold weather months are migrants. The first few arrive in August and the last few depart in late April but the largest flocks do not come until early October, though even these flocks are not so large as those in which they assemble prior to departure in early April. They scatter all over the plains of India and are found up to 8,000 feet in the Himalayas in suitable places. They form, next to Snipe, the favourite small-game shooting in India and good bags are often made of them alone, though more often they constitute the most numerous item in mixed bags. They fly well, fast and straight, but tumble headlong into the cover after covering a couple of hundred yards or so, giving quick but not very difficult shots. After the flocks disperse the birds keep in pairs. The call consists of a loud whistle, followed rapidly by two short notes. They feed on grass and other seeds as well as on insects and are themselves a very great table delicacy.

(1951) Coturnix coturnix japonica.

THE JAPANESE GREY QUAIL.

Coturnix japonica Temm. & Schleg., Faun. Jap., p. 103 (1842) (Japan).
Coturnix communis. Blanf. & Oates, iv, p. 114 (part.).

Vernacular names. *Gnon* (Burm.).

Description.—Adult male. Differs from the typical forms in having no blackish on the chin and throat and no cross-bars, these

parts and the sides of the head being light brick-red; the plumage is frequently richer and darker and the feathers of the sides of the chin are often rather lengthened and bristly.

Colours of soft parts as in the Common Quail.

Measurements. Wing 91 to 104 mm.

Female differs from the Western form in having the feathers of the chin and sides of the lower cheeks stiff, long and pointed, forming a little bristly beard.

Distribution. Breeding from Eastern Siberia to Japan. In Winter migrating to Southern China, the Indo-Chinese countries, Burma and to Assam South of the Brahmapootra.

Nidification. The Japanese Quail breed in great numbers in Japan from the end of May to July, laying eight to twelve eggs in a hollow, natural or made by the birds, lined with leaves and grass and placed either in grass-land or in standing crops, less often on hill-sides under shelter of a boulder. The eggs are not distinguishable from those of the Common Quail and vary in similar degree. Eighty eggs average 28·7 × 22·4 mm.: maxima **32·6** × 22·4 and 32·0 × **24·5** mm.; minima **26·2** × 22·1 and 27·2 × **20·5** mm.

Habits. Much the same as those of the preceding bird but there appear to be no permanently resident birds anywhere within our area, all being regular North and South migrants in the Autumn and Spring.

(1952) Coturnix coromandelica.

THE BLACK-BREASTED OR RAIN-QUAIL.

Tetrao coromandelica Gmelin, Syst. Nat., i. p. 764 (Coromandel Coast).
Coturnix coromandelica. Blanf. & Oates, iv. p. 116.

Vernacular names. Not generally distinguished from the Grey Quail. Additional names are: *China Butteya* (Upper India); *Chanac* (Nepal); *Kade* (Tam.); *Chinna Yellichi* (Tel.); *Ngōn* (Burma); *Chinnung Buttér* (Lucknow).

Description.—Adult male. Upper plumage, wings and tail the same as in the Common Quail but generally rather richer and deeper in tint; primaries and outer secondaries brown, edged pale *but with no bars*; head, chin and throat only differing from the Common Quail in having broad, more jet-black bars and the intervening spaces very pure white; centre of breast and upper abdomen black; flanks fulvous with broad streaks of velvety-black.

Colours of soft parts. Iris hazel to deep brown; bill black in the breeding-season; horny black and paler at the base in non-breeding and young birds; legs and feet fleshy or fleshy-grey, more pink in the breeding-season.

Measurements. Wing 83 to 92 mm.; tail 30 to 32 mm.; tarsus 25 to 26 mm.; culmen about 13 mm.

Females. Generally rather more richly coloured but otherwise only distinguishable by its smaller size.

Distribution. Practically throughout Ceylon, where it is rare, India and Burma to the Shan States. Obtained at Simla, 7,000 ft., by Dodsworth.

Nidification. The Rain-Quail breeds, as its name infers, after the break of the rains from June to October, though a few birds lay also in the month of April and early May. The nesting is like that of the Common Quail, though this bird occasionally selects a site in the scrub or, on the other hand, sometimes right in open fields under cover of a cactus-hedge or bush. The eggs only differ from those of the Common Quail in being much smaller and require no further description. One hundred and twenty eggs average 27·4 × 20·8 mm.: maxima 30·8 × 22·4 mm.; minima 25·2 × 20·8 and 26·9 × 19·2 mm.

The clutches run smaller than those of other species of *Coturnix*, four are frequently incubated whilst six to eight is the average, though they run up to eleven.

This genus is monogamous.

Habits. The Quail has generally been considered locally migratory but, if so, the migrations must be very local, possibly only movements from the driest areas with no cover to adjacent areas with some bush or other form of jungle in which the birds can seek protection from the sun in the hottest driest months. In every way this little Quail resembles the Common Quail, but its note is a musical "whit-whit-whit-whit," constantly repeated.

Genus **PERDICULA.**

Perdicula Hodg., Beng. Sport. Mag., ix, p. 344 (1837).

Type, *Perdix asiatica* Lath.

The genus *Perdicula* contains but one species, *Perdicula asiatica*, with two races, *P. a. asiatica* and *P. a. argoondah*, hitherto always considered to be species. The distribution of the two is most puzzling, as they constantly overlap, but many individuals are exactly halfway between the two and it would seem that, whilst the extremes are very distinct, there is an immense intervening area where there is no really constant form.

The genus is peculiar to the Indian Peninsula and is, in many respects, nearer the Partridges than the Quails. In size they are small; the bill is short and thick and the culmen very convex; the wing is short and rounded, the first primary equal to the eighth and the fourth longest; the tail of twelve feathers is about half the length of the wing; the tarsus is equal to the middle toe and claw and the male has a short blunt spur.

The sexes differ in colour.

Key to Subspecies.

A. Breast barred black and white. (Males.)
  a. Supercilium and line between cheeks and throat conspicuous. No barring on back ..... *P. a. asiatica*, p. 377.
  b. Supercilium and cheek-stripe obsolete or absent; back barred with rufous or buff. *P. a. argoondah*, p. 379
B. Breast dull vinaceous or rufous-buff. (Females.)
  c. Inner webs of primaries brown throughout. *P. a. asiatica*, p. 377.
  d. Inner webs of primaries mottled or barred with buff ..... *P. a. argoondah*, p. 379.



Fig. 47.—Head of *P. a. asiatica*, ♂. ½.

(1353) Perdicula asiatica asiatica.

THE JUNGLE BUSH-QUAIL.

Perdix asiatica Lath., Ind. Orn., ii, p. 649 (1790) (Mahratta region).
Perdicula asiatica. Blanf. & Oates, iv, p. 118.

Vernacular names. *Lowa* (Hind.); *Juhar* (Manbhum); *Auri-connai* (Santhal); *Girza-Pitta* (Tel.); *Kari-Lewya* (Can.); *Chota Buttir* (Saugur).

Description.—Adult male. Forehead, supercilia, chin, cheeks, anterior ear-coverts and throat rufous-chestnut; posterior ear-coverts brown; a broken white line above the supercilium; crown brown, bordered with black and more or less barred with the same; sides of neck, back, rump and upper tail-coverts fulvous-brown, with narrow wavy black bars and the back with narrow whitish shaft-lines also; scapulars, inner wing-coverts and inner secondaries brown with bold black bars, some rufous barring and creamy central streaks; bastard-wing, outer coverts and remaining quills brown with rufous bars on the outer webs; tail brown with black-edged buff bars; below from the throat barred black and white; vent, thighs and under tail-coverts rufous, vinous-rufous or rufous-buff.

The breast is pure black and white in old birds only, whilst in younger ones the whole lower surface is more or less suffused with vinaceous and the crown also is more or less rufous.

Colours of soft parts. Iris light to dark brown; bill horny- or slaty-black, often more reddish at the base or, sometimes, the basal two-thirds; legs and feet dull yellowish; yellowish-orange to light reddish-brown.

Measurements. Total length about 165 to 175 mm.; wing 77 to 92 mm.; tail 35 to 40 mm.; tarsus 28 to 29 mm.; culmen about 10 mm. Weight "2 to 2·85 oz." (*Hume*).

Female. Above like the male but without the pale central streaks and less boldly marked on the scapulars and inner secondaries; lower parts dull vinaceous or lilac-rufous, rather darker and more rufous on the breast.

Measurements. Wing 78 to 86 mm.

Young males are like the female but have little or no rufous on the head or throat; the crown and back have very narrow pale central streaks; the lower parts are paler, more lilac-rufous, whilst the chin, throat and sides of the head are profusely streaked with creamy-white; the breast is similarly marked and in some cases the posterior flanks also.

Chick in down. Head rufous-brown with broad white supercilia: lores and a line under the eye dark brown; chin, cheeks and sides of the head and neck rich rufous mottled with brown; lower parts dull fulvous streaked with white on throat and breast.

Distribution. In well-wooded localities from the Himalayas to Ceylon. In the Outer Himalayas and Kashmir it occurs up to 4,000 feet and in the hills of Southern India up to 3,500 feet. It has not been found in Sind but is common in parts of Jodhpur and Rajputana, extending thence through the Western coasts to Ceylon; it is common in the Deccan to the South and East of the North-West Provinces and extends East to Behar, Western Bengal and Orissa.

Nidification. The Jungle Bush-Quail breeds from September to the end of February, a few birds laying in August. The nest is a mere scratching in the soil beneath a bush, tuft of grass or other cover, but it is always well lined with grass by the birds. The site selected is in long grass, thin scrub or bush-jungle, or in standing crops of some kind such as millet; it never breeds in very open desert places where there is hardly any vegetation as the next bird so often does. The number of eggs laid varies from four to eight, six being perhaps the most common number. They vary in colour from a creamy white to a pale buff or café-au-lait, never very deep. One hundred eggs average 25·4×19·5 mm.: maxima 27·6×21·0 and 26·8×22·0 mm.; minima 24·1×19·3 and 25·0×18·4 mm.

This species is monogamous and the cock assists the hen in looking after the young but not in incubation, which takes sixteen days. The hen is a very close-sitter.

Habits. This Quail is resident from the plains up to some 5,000 feet, frequenting thin dry jungle of almost any kind from grass and scrub round about villages to fairly thick deciduous forest. They feed morning and evening in the cultivated fields and grass-lands, chiefly on grass-seeds but also on many other kinds of seeds, small grain and insects. They are very sociable and, as soon as the eggs hatch, two or three families join forces, the cocks being perfectly friendly although most determined little fighters in

the early part of the breeding-season. Their ordinary call has been syllabified by Butler as a whistled "tiri-tiri-tiri" but an angry or challenging cock-bird has a large variety of notes and cackles.

(1954) Perdicula asiatica argoondah.

THE ROCK BUSH-QUAIL.

Coturnix argoondah Sykes, P.Z.S., 1832, p. 153 (Deccan).
Perdicula argoondah. Blanf. & Oates, iv, p. 119.

Vernacular names. *Lowa* (Hind. and Mahr.); *Lawunka* (Tel.); *Sinkadah* (Tam.); *Kempa-lowya* (Can., Mysore).

Description.—Adult male. Differs from *P. a. asiatica* in having the scapulars, mantle and innermost secondaries barred with pale buff, rufous-buff or pale rufous, these bars edged with black; the pale streak between the rufous throat and the cheeks is wanting; there is less black on the upper plumage, the black spots on the mantle being few or none at all; the primaries are barred on both webs; the white supercilium is indistinct and the black line above it wanting.

Colours of soft parts and **Measurements** as in the preceding bird: wing 72 to 94 mm.

Female. Whole upper parts vinous-rufous, the rump, upper tail-coverts and tail faintly barred with brown and white; the mantle is occasionally speckled with white and black; the inner webs of the primaries are barred and mottled with buff and only the front of the chin is rufous.

Distribution. South-East of India from Madras to the extreme South but not Ceylon; West it extends to the drier plains of Mysore and Travancore, parts of the Bombay Presidency, the Deccan, Rajputana, Cutch, Gugerat, the United Provinces and portions of the Punjab.

The habitats of the Jungle and the Rock Bush-Quails would seem to overlap to an extent which would forbid their being called subspecies, but Hume explains this as follows:—"It avoids mountains, which it never ascends, forest and thick jungle and eschews well-watered and richly-wooded or cultivated tracks; it loves dry, open, sandy or even rocky plains or low hillocks sparsely studded with thorny bushes; elevation is not of so much consequence to it as the openness and semi-waste character of the place. . . . . Dry, half-barren, sparsely-cultivated plains' districts are its choice and hence it follows that although, where localities such as it affects intergrade with those that the Jungle Bush-Quail prefers, you may shoot both species in the same stubble, yet, speaking broadly, where you find the Rock Bush-Quail, there, as a rule, you do not find the other."

Nidification. Only differs from that of the preceding bird in the description of site chosen. This instead of being in jungle is generally in the open on barren wastes, rocky or sandy semi-deserts or bare semi-cultivated tracks. Any small bush, tuft of

withered grass or convenient rock on the sunny side suffices as a shelter, whilst occasionally the nest is placed in thin grass or, more rarely still, in some patch of grain surrounded by uncultivated waste. The eggs are indistinguishable from those of the Jungle Bush-Quail. Eighty of them average 25·6 × 20·1 mm.; maxima 28·8 × 19·5 and 28·3 × 22·4 mm.; minima 24·2 × 18·9 mm.

Habits. As is shown in the above notes quoted from Hume, this is a bird of the open waste country and not of scrub, grass or light jungle; otherwise the habits of the two birds are identical. They both have a flight very similar to that of the Common Quail, quick and direct with a final sudden drop into cover.

Genus CRYPTOPLECTRON.

Cryptoplectron Streubel, in Ersch. u. Gruber Allg. Encyl., 3, vol. xvi, p. 291 (1842).

Type, *Coturnix erythrorhyncha* Sykes.

The genus *Cryptoplectron* is very closely allied to *Perdicula* but differs from that genus in many important respects. The tail has ten instead of twelve feathers; the tarsus has no spur; the bill is decidedly longer and less high; the wing is shorter and more rounded, the first primary about equal to the tenth and the fourth, fifth and sixth subequal and longest.

There are only two species known and these are confined to India and, possibly, the extreme North-West of Burma in the Chin Hills East and South of Manipur.

The generic name *Microperdix* Gould ('Birds of Asia,' vii, pl. 3, 1862) is antedated by *Cryptoplectron*, so that the latter name must be used.

Key to Species.

A. Upper surface brown with black spots.
  a. Throat white ..... *C. erythrorhynchum*, ♂, p. 381.
  b. Throat, chest and breast brick-red . *C. erythrorhynchum*, ♀, p. 381.
B. Upper surface slaty-grey with black bars and spots.
  c. Throat chestnut ..... *C. manipurensis*, ♂, p. 383.
  d. Throat dark grey ..... *C. manipurensis*, ♀, p. 383.

Cryptoplectron erythrorhynchum.

Key to Subspecies.

A. Throat white.
  a. Darker and larger; wing 81 to 92 mm. ..... *C. e. erythrorhynchum*, ♂, [p. 381.
  b. Paler and smaller; wing 76 to 84 mm. ..... *C. e. blewitti*, ♂, p. 382.
B. Throat, chest and breast brick-red.
  c. Darker and larger ..... *C. e. erythrorhynchum*, ♀, [p. 381.
  d. Paler and smaller ..... *C. e. blewitti*, ♀, p. 382.

(1955) Cryptoplectron erythrorhynchum erythrorhynchum.

THE PAINTED BUSH-QUAIL.

Cotur'ix erythrorhyncha Sykes, P. Z. S., 1832, p. 153 (Karli Valley, North Konkan).
Microperdix erythrorhynchum. Blanf. & Oates, iv. p. 121.

Vernacular names. *Kokni-lowa* (Hind.); *Kadai* (Tam.).

Description.—Adult male. Forehead, lores, point of chin and round the eye black, produced as a band round the white cheeks, ear-coverts, chin and throat; a broad band over the forehead and from above the eye to the nape white, sometimes spotted with black; crown black, brown in the centre and sometimes mixed with brown at the sides; upper parts brown tinged with olive and each feather with a velvety-black subterminal spot; scapulars,



Fig. 48.—Head of *C. e. erythrorhynchum*, ♂. ½.

wing-coverts and innermost secondaries with white or creamy shaft-lines; the coverts towards the outer edge of the wing are more and more barred with rufous; the outer primaries are edged with rufous and the inner primaries barred with the same on the outer webs; secondaries more definitely barred across both webs; tail-feathers blackish-brown barred with rufous; the bars paler towards the tips; remainder of lower parts chestnut, the upper breast washed with the colour of the back and the feathers sub-tipped with small black spots; sides of the breast, flanks and under tail-coverts with large subterminal black blotches and pure white fringes.

Colours of soft parts. Iris dull grey-brown (*?juv.*) to brown, light yellow-brown or hazel; bill, legs and feet deep red. Young birds have the legs a duller red, almost a brownish-red.

Measurements. Wing 81 to 92 mm.; tail 38 to 49 mm.; tarsus 25·5 to 27 mm.; culmen 14 to 16 mm.

Female. Head and throat with no black and white, these colours being replaced by dull rufous; the black marks on the crown and back are smaller; the wings are marked with paler and duller rufous; the breast is immaculate rufous, the blotches on the flanks are smaller and the white on the lower parts is wanting or nearly so.

Measurements. Wing 84 to 89 mm.

Chick in down. "Pretty little dark things with three stripes of a light cream-colour extending down their backs" (*Miss Cockburn*).

Distribution. South-West India, from Poona to Travancore, through the various hill-ranges of Mysore, Nilgiris, Palni Hills, Cardamon Hills, Wynaad and throughout the Western Ghats.

Nidification. This Quail breeds at all elevations, having two breeding-seasons, during the cold-weather months December to March and again from August to October. There is no nest, the bird scratching a hollow under a bush or rock in the scrub or jungle or in among ferns, long grass etc. at the edge of forest. They lay from four to seven eggs, very rarely up to ten or eleven, which are large rather deeper-coloured replicas of those of the preceding species. Fifty eggs average 31·0×23·0 mm.: maxima **34·3**×24·0 and 31·1×**24·3** mm.; minima **27·6**×22·5 and 27·9×**21·5** mm.

Habits. The Painted Bush-Quail frequents broken ground where cultivated tracts are mixed with light forest, scrub-jungle and grass cover and is said even to wander into gardens to feed in the mornings and evenings. Davison likens their call to the sounds "tu-tu-tu-tu-tutu-tutu," different to the call of *C. asiatica* though in other respects their habits are very similar.

(1956) Cryptoplectron erythrorhynchum blewitti.

BLEWITT'S BUSH-QUAIL.

Microperdix blewitti Hume, Str. Feath., ii. p. 512 (1874) (Raipur); Blanf. & Oates, iv, p. 122.

Vernacular names. *Sersei lowa* (Mandla, Balaghat, Chanda).

Distribution.—Adult male. Differs from the preceding race in being duller and paler; the black gorget round the throat is very broken; the white sincipital line is broader and the black forehead narrower; the brown-grey wash on the breast is stronger and comes lower down, whilst there is more white on the feathers of the flanks.

Colours of soft parts. "Iris brown; bill, legs and feet coral-red" (*Hume*).

Measurements. Wings 76 to 84 mm.; tail 39 to 44 mm.; tarsus about 26 mm.; culmen 13 to 14 mm.

Female differs from the female of the Painted Bush-Quail in being paler and duller.

Immature birds are like the female but show considerable white shaft-lining both on the breast and upper back.

Distribution. Central Provinces, North and East of the preceding race, having been obtained in Mandla, Balaghat, Seoni, Chandpur, Raipur, Sironcha and Bastar; it occurs in the South-West of the Sambalpur District and thence North-East to Manbhum, Singbhaum and Hazaribagh.

Nidification. Nothing recorded. Three eggs sent to me from Chanda as the eggs of the Painted Quail are undoubtedly those of this bird. They were taken on the 3rd August, laid on the ground in a scratching made in thin Sal- and scrub-jungle. They measure 30·5 × 24·0, 32·0 × 23·0 and 30·0 × 23·4, and in appearance are like those of the typical form but with a strong olive tinge. Blewitt says that the breeding-season is from November to January but Thompson says that he saw young on the wing in September and that they lay in June to July.

Habits. Similar to those of the preceding bird but its whistle is said to be softer and more melodious.

Cryptoplectron manipurensis.

Key to Subspecies.

A. Throat chestnut.
  a. Entire upper surface barred with black ..... *C. m. manipurensis*, ♂, p. 383.
  b. Upper surface with very little black barring ..... *C. m. inglisi*, ♂, p. 384.
B. Throat dark grey.
  c. Upper surface boldly marked with black ..... *C. m. manipurensis*, ♀, p. 383.
  d. Upper surface faintly marked with black..... *C. m. inglisi*, ♀, p. 384.

(1957) Cryptoplectron manipurensis manipurensis.

THE MANIPUR BUSH-QUAIL.

Perdicula manipurensis Hume, Str. Feath., ix, p. 467 (1889) (hills of Eastern Manipur Hills).
Microperdix manipurensis. Blanf. & Oates, iv, p. 122.

Vernacular names. *Lang-Soibol* (Manipur).

Description.—Adult male. Forehead, round the eye, cheeks, chin and throat deep rufous-chestnut; lores, a line through the eye and a spot behind the ear-coverts white; ear-coverts brown; the whole upper plumage dark slaty-grey barred throughout with velvety-black, the bars becoming bold patches on the scapulars and inner secondaries; quills dark brown, the outer primaries edged with buff, the inner primaries and outer secondaries barred with the same; neck and upper breast ashy-grey with black centres to the feathers; lower breast and abdomen rufous-buff, more grey on the flanks, each feather with a black cross formed by the black shaft-line and a broader cross-bar; under tail-coverts black, tipped and spotted with white.

Colours of soft parts. Iris dark brown or hazel; bill dark grey, yellowish at the base; legs and feet orange-red to deep vermilion-red, probably darker and more red in the breeding-season; claws light brown.

Measurements. Wing 80 to 86 mm.; tail 45 to 52 mm.; tarsus about 25 to 26 mm.; culmen 14 to 15 mm. Weight 2½ to 2¾ oz.

Female differs from the male in being duller and paler, in having no chestnut on the head and in having the rufous of the lower parts replaced by pale greyish-buff, whilst the centre of the chin and throat is very pale grey.

Distribution. Manipur, Cachar, Naga Hils and Khasia Hills.

Nidification. On the 13th May I found a nest containing four eggs in some thin grass, not more than a couple of feet high on a grass-covered hill in North Cachar, shooting the hen bird off it. The nest was merely a hollow among the roots of the grass, lined with a little grass. The eggs are indistinguishable from those of other *Cryptoplectron* but are purer white than most; they measure 30·4 × 24·1, 31·2 × 23·5, 31·2 × 24·0 and 29·3 × 24·9 mm.

Habits. This little Quail is not uncommon in Manipur and Eastern Cachar from the foot-hills up to some 3,000 feet, but it keeps so closely to dense grass, reeds etc. that unless one knows exactly where to look it is never seen. Quite possibly it is equally common in the similar immense grass areas in Western Cachar and Sylhet, stretching all along the foot-hills. They associate in small coveys, possibly family-parties, and keep close together, running when disturbed and very averse to flight but, when once on the wing, flying well and straight and then tumbling into the grass again after flying some fifty yards or so. Their call is a sweet low whistle, uttered principally in the evenings. They feed on grass-seeds, berries, roots etc. and all small insects but grass-seeds and ants form their staple food. They are excellent little birds for the table and invariably very fat and tender.

(1958) Cryptoplectron manipurensis inglisi.

PRIMROSE'S BUSH-QUAIL.

Microperdix inglisi Ogilvie-Grant, Journ. Bomb. Nat. Hist. Soc., xix, p. 1 (1909) (Goalpara).

Vernacular names. *Kala Goondri* (Assam).

Description.—Adult male. Differs from *C. m. manipurensis* in being rather paler and less boldly marked with black both above and below.

Colours of soft parts. Iris brown; bill dark grey, base of mandible lighter and in some cases tinged with yellow; tarsus orange-red, toes and back of tarsus lighter; claws light brown (*Inglis*).

Measurements as in the typical form.

Female is paler and more grey than the female of *C. m. manipurensis* and has the black markings on the lower plumage less conspicuous.

Young birds are browner than the adult but more heavily marked with black. Bill above dark grey, with pale tip and pale base to lower mandibles; tarsus flesh-colour.

Distribution. The foot-hills and adjoining plains of the Eastern Dooars, Jalpaiguri and Assam Eastwards to Sadiya.

Nidification. Unknown.

Habits. Very little recorded except in notes by Inglis and Primrose, who found this Quail very common in Goalpara. In habits they closely resemble the Manipur Bush-Quail but are occasionally found in forest, especially when the heavy grass has been burnt. In the mornings and evenings they feed in the open, but never far from cover.

Genus **ARBOROPHILA**.

Arborophila Hodgs., Madr. Journ., v, p. 303 (1837).

Type, *Perdix torqueola* Valenc.

This genus contains a group of little Game-birds, very typical Partridges in appearance but differing both in habits and osteologically from the true Partridges. The legs are longer comparatively than in either *Perdix* or *Francolinus* and have no spurs,



Fig. 49.—Skull of *A. r. rufogularis*. ½. *s.o.*, superorbital bones.

whilst the claws are very long and straight. There is a superorbital chain of bones; the wing is short and rounded, the first primary between the 8th and 10th in length, the 4th and 5th subequal and longest; the tail, of 14 soft feathers, is equal to about half the length of the wing.

The genus extends from the Himalayas, through the Indo-Chinese countries and the Malay Peninsula to Sumatra, Java and Borneo and to Luzon in the Philippines.

Key to Species.

A. Feathers of flanks more or less chestnut.
  a. Breast grey.
    a'. Crown chestnut ..... *A. torqueola*, ♂, p. 386.
    b'. Crown olive-brown ..... *A. rufogularis*, p. 389.
  b. Breast brownish, crown olive-brown with black spots ..... *A. torqueola*, ♀, p. 386.
  c. Breast chestnut ..... *A. mandellii*, p. 395.
B. No chestnut on flanks.
  d. Breast grey ..... *A. atrogularis*, p. 393.
  e. Breast pale brown or buffy-brown .... *A. brunneopectus*, p. 396.

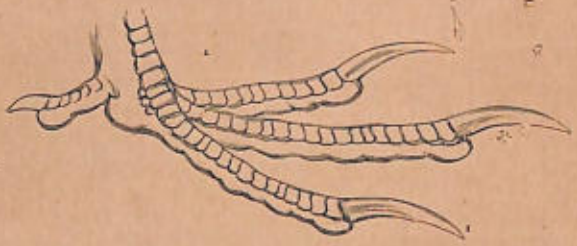


Fig. 50.—Foot of *A. t. torqueola*. ½.

Arborophila torqueola.

Key to Subspecies.

A. Breast grey; crown chestnut.
  a. No chestnut on sides of neck.
    a'. Abdomen pure white ..... *A. t. torqueola*, ♂, p. 386.
    b'. Abdomen rufescent ..... *A. t. millardi*, ♂, p. 388.
  b. Sides of neck more or less chestnut.... *A. t. batemani*, ♂, p. 389.
B. Breast brownish; crown olive-brown with black spots ..... [subspecies, pp. 386–9. *A. t. torqueola*, ♀, and

(1959) Arborophila torqueola torqueola.

The Common Hill-Partridge.

Perdix torqueola Valenc., Dict. Sci. Nat., xxxviii, p. 435 (1828) (Bengal).
Aboricola torqueola. Blanf. & Oates, iv, p. 125 (part.).

Vernacular names. *Peunra*, *Ban-titur* (Hind., Kuman, Nepal etc.); *Kohumbut* (Lepcha); *Sipung-Lulu* (Tibet); *Pao-er* (Chulikatta, Mishmi); *Peora* (Nep.); *Daobui* (Cachari); *Inrui-whip* (Naga).

Description.—Adult male. Crown to nape bright chestnut, the latter more or less spotted with black; narrow line across forehead, lower cheeks and broad supercilia black, the last mixed with white next the crown and nape; ear-coverts golden-rufous; a line under the supercilia chestnut, spotted with black; upper parts

golden olive-brown, each feather margined with black and with two or three crescentic black bars; rump and upper tail-coverts with bold black centres and very narrow black edges; central tail-feathers olive-brown, mottled with black; outer feathers brown with chestnut-buff edges; scapulars, wing-coverts and innermost secondaries light golden-brown with black spots and narrow margins and broad splashes of deep chestnut; primaries and outer secondaries dark brown, the former with narrow rufous margins and the latter with mottled margins of rufous and brown; chin, throat, fore-neck and sides of neck black, the neck with white streaks; a moustachial white streak, sometimes marked with black; a white band between fore-neck and breast; breast grey; centre of abdomen white; flanks and sides of abdomen grey with a few white drops or streaks in the centre of the feathers and the greater parts of the inner webs deep chestnut; vent rufous-white with black bars; under tail-coverts black and white.

Colours of soft parts. Iris brown to crimson-brown; bill black; legs dull fleshy or livid grey, but always with some fleshy tint which is more pronounced in the breeding-season; orbital skin crimson-red, brighter when breeding.

Measurements. Wing 148 to 161 mm.; tail 76 to 83 mm.; tarsus about 44 to 45 mm.; culmen about 19 to 21 mm. Weight "8 oz. in a small female to 13·6 in a large fat male."

Female. Iris brown; orbital skin livid red or purplish-pink; bill black, commissure and gape horny-brown; legs duller than in the male, sometimes olive-brown.

Measurements. Wing 140 to 151 mm.

Young male like the adult but with the supercilia absent or obsolete; there is no chestnut on the flanks and but little on the wing-coverts, whole lower plumage spotted with white from breast to vent.

Distribution. Garhwal and Kuman to the extreme East of Assam, North of the Brahmapootra and to Tibet etc. South of this river it is found rarely in the higher ranges of the Naga Hills and the Barail Range and other high ranges North of Cachar and Manipur. Rothschild attributes to this race three specimens obtained by Forrest in Yunnan.

Nidification. The Common Hill-Partridge breeds throughout its range from 5,000 to 10,000 feet, possibly up to 14,000 feet. The nest is merely a hollow, either natural, or made by the birds themselves, in forest, Ringal or scrub-jungle, generally well concealed but sometimes in very thin undergrowth and easily seen. The eggs, like those of all species of *Arborophila*, are a pure glossy white, with a fine close texture. In shape they are pointed ovals running to pyriform in extreme cases, rarely blunt or broad ovals. Sixty* eggs average 40·6 × 31·9 mm.: maxima 44·2 × 33·6 and

* Since writing about this species in the Bombay Nat. Hist. Journal I have received information that a series of eggs sent me as of this species were really those of *A. r. rufogularis*.

43·8 × 34·0 mm.: minima 35·6 × 28·7 and 35·8 × 27·4 mm. The breeding-season is from the end of April to late June. The hen bird is a very close sitter and the cock-bird, which is monogamous, assists her in incubation to some extent and also in looking after the young.

Habits. The Common Hill-Partridge haunts considerable extremes of elevation. In Sikkim Stevens says that 7,000 to 10,000 feet is its normal habitat but that it may come down to 5,000 feet and up to 14,000 feet but that it is rare over 12,000 feet. In Assam it occurs as low as 4000 feet in Winter, though this is rare. It is a bird of heavy forest, broken up by ravines, rocks, etc. but with plenty of undergrowth whilst it is also found in Pingal-bamboo jungle and lighter forest, especially if on the banks of hill-streams. They go about in small coveys of six to ten birds, almost certainly pairs of old birds with their last brood, feeding on insects and seeds varied with leaves, roots, berries, etc. They are quiet little birds, very quick in their movements, occasionally uttering a soft little chuckle or subdued whistle to one another and seldom separating for any distance. Their call is a very beautiful loud ringing whistle, audible at a great distance and generally uttered in the evenings, often very late. They roost on trees or bamboos, the whole family tucking themselves away in as close a row as possible on the same branch.

(1960) **Arborophila torqueola millardi.**

THE SIMLA HILL-PARTRIDGE.

Arboricola torqueola millardi Stuart Baker, Bull. B. O. C., xli, p. 101 (1921) (Koteghur).
Arboricola torqueola. Blanf. & Oates, iv, p. 126 (part.).

Vernacular names. *Roli, Ram-chukra* (Chamba); *Peora, Bantitur* (Hind.).

Description.—**Adult male.** Differs from *A. t. torqueola* in having the chestnut of the crown less bright and darker; the breast is neither so dark nor pure a grey and is tinged with ashy; the abdomen is nearly always strongly suffused with rufous.

Colours of soft parts as in the other races.

Measurements. Wing, ♂ 150 to 161 mm., ♀ 144 to 150½ mm.

Female differs from that of the last bird in having the chestnut of the throat much paler, the breast a paler and much more rufous-grey.

Distribution. Simla Hills, extending North and West into Chamba, Kullu and the Kangra Valley.

Nidification. A nest from which nine eggs were taken for Whistler is described as having been built in a round hole in a bank about 8½″ in diameter lined with grass, making a nest about 6″ in diameter. The eggs were taken on the 2nd May at

an elevation of about 8,500 feet. The nest was almost in the open, but very carefully hidden and the entrances always closed with grass in the birds' absence and it was built close to ample undergrowth.

Habits. Apparently breeds between 9,000 and 10,000 feet but at other times occurs as low as 5,000 feet. Voice, flight etc., are exactly like those of the preceding race.

(1961) Arborophila torqueola batemani.

OGILVIE-GRANT'S HILL-PARTRIDGE.

Arboricola batemani Ogilvie-Grant, Bull. B. O. C., xvi, p. 68 (1906) (Fatum, Chin Hills).

Vernacular names. *Wogam*, *Gam-toung* (Kachin).

Description.—Adult male. Differs from his preceding races in having the sides of the neck much mixed with chestnut or even wholly of that colour; the chin, throat and neck are more frequently marked with white; the chestnut on the scapulars and inner secondaries is darker, duller and greater in extent.

Colours of soft parts as in the other races.

Measurements. Wing 144 to 154 mm.

Female very close to that of *A. t. torqueola* but generally more rufous in the tone of the upper plumage.

Distribution. Chin Hills and Kachin Hills.

Nidification. Harington's collectors took the eggs of this subspecies near Haka in the Chin Hills on the 24th April and 22nd May, both clutches of four eggs, laid in hollows scratched in the ground in evergreen-forest and lined with fallen leaves and grass. The eggs are the usual pure china-white and vary in size between 37·5 × 29·2 and 41·5 × 30·5 mm.

Habits. Harington met with these birds in small coveys or pairs, in shady evergreen-forest near streams. He says that they "have soft purring notes and when scattered call to one another in low whistling calls," whilst in the evenings "they may be heard indulging in a regular whistling solo in which they run up the scales in double notes."

Arborophila rufogularis.

Key to Subspecies.

A. Rufous throat with a band of black below it ..... *A. r. rufogularis*, p. 390.

B. No black band below rufous throat.

a. Black spots on the throat close and numerous ..... *A. r. intermedia*, p. 391.

b. Spots on throat sparse and inconspicuous ..... *A. r. tickelli*, p. 393.

(1962) Arborophila rufogularis rufogularis.

"Blyth's or The Rufous-throated Partridge."

Arboricola rufogularis Blyth, J. A. S. B., xviii, pt 819 (1849) (Sikkim).
Arboricola rufigularis. Blanf. & Oates, iii, p. 126.

Vernacular names. *Peura* (Kuman); *Kohunabut* (Lepcha); *Pokhe* (Dafla).

Description.—Adult male. Crown olive-brown, the tips of the feathers blackish; forehead more grey and unspotted; lores and broad supercilia greyish-white streaked with black; sides of head the same, becoming rufous-brown on the posterior ear-coverts; a pure white streak from lower mandible to under ear-coverts; nape olive-brown, marked with rufous, especially on the sides, and with large black drops and a few smaller ones of white or rufous-white; upper parts glossy olive-brown, the rump and upper tail-coverts with black centres to the feathers; scapulars and wing-coverts chestnut, with a large grey and a smaller black spot on each feather; primaries rufous-brown; secondaries brown, mottled with rufous, this colour increasing inwardly, the innermost secondaries being like the scapulars but with less grey; chin to fore-neck bright rufous, the chin and throat spotted with black and with white bases to the feathers; next the rufous a well-defined black band; breast and flanks slaty-grey, paler on the abdomen; the flanks marked with deep chestnut, most of the feathers with a white central spot or streak; posterior flanks and vent pale rufous-brown, mottled with black and white; under tail-coverts rufous with broad black bars and white tips.

Colours of soft parts. Iris red-brown, orbital skin lake-red or dull crimson; bill black; legs red or salmon-red; claws horny.

Measurements. Wings 131 to 142 mm.; tail 50 to 56 mm.; tarsus 40 to 44 mm.; culmen 18 to 19 mm. "Weight 7 to 10½ ozs." (*Hume*).

Female differs from the male in having fewer black spots on the chin and throat and more white drops on the breast and abdomen.

Young male. Throat immaculate rufous-brown, much paler than in the adult; underparts smoky-slate with numerous white spots all over breast, abdomen and flanks.

Distribution. Kuman and Garhwal to the extreme East of Assam.

Nidification. The Rufous-throated Partridge breeds from the foot-hills up to 8,000 feet, from April in the lower elevations to July in the higher ranges. The nest has been described as a hollow in the ground with no lining, or a hollow well lined with a pad of grass, whilst Masson found a nest in thin grass near Darjeeling "well made of grass, with a deep cup and the grass prolonged to make the whole affair semi-domed." The number of eggs laid is uncertain. Eight have been recorded but Whymper

took three hard-set at Naini Tal and three to five seem to be the normal clutch. They differ in no way from those of the other *Arborophila* eggs and twenty-four average 39·9 × 30·8 mm.: maxima 42·2 × 29·2 and 40·2 × 31·8 mm.; minima 37·2 × 30·0 and 38·4 × 26·9 mm.

The nest seems to be always placed in thick cover, generally evergreen-forest but also in bamboo-jungle, grass-land and patches of grass round about Tea Estates and cultivation. It is generally very well concealed and the hen is a close sitter.

Habits. The various races of the Rufous-throated Hill-Partridge are birds of lower elevation than those of the Common Hill-Partridge, though their habitat over the intermediate ranges, between 4,000 and 8,000 feet, may often overlap. They frequent heavy tree-forest but prefer such as is broken up with ravines and rocks and where there are spaces without much undergrowth in which they can move about freely as they feed. They are also found in all other kinds of jungle and, generally speaking, their habits differ in no way from those of the next subspecies, a much better-known race.

(1963) Arborophila rufogularis intermedia.

THE ARRAKAN HILL-PARTRIDGE.

Arboricola intermedia Blyth, J. A. S. B., xxiv, p. 227 (1856) (Arrakan); Blanf. & Oates, iv, p. 127.

Vernacular names. *Toung-Kha* (Burm.); *Wogam* or *Gam-toung* (Kachin); *Dao-bui* or *Daobui-yégashi* (Cachari); *Inrui-whip* (Kacha-Naga); *Du-boi* (Assam).

Description. Similar to the preceding bird but the spots on the chin and throat are so close together that these parts appear almost black, whilst the black band below the rufous throat is wanting; the abdomen is generally a paler slate and the spots on the crown are larger and a deeper black.

Colours of soft parts. Iris brown; orbital skin, gular skin and gape red; bill black; legs red, claws paler and horny. In the breeding-season the colours of all the soft parts become much brighter, the facial skin becomes a brilliant red, whilst the legs become vivid coral-red rather than brick-red as in the Autumn and Winter.

Measurements. Wing 138 to 148 mm.; tail 52 to 60 mm.; tarsus 37·5 to 42·0 mm.; culmen about 18 to 19 mm.

Female. Like that of *A. r. rufogularis* but with no black band below the chestnut throat and the chin and throat rather more spotted with black, though never anything like that of the male. Wing 134 to 143 mm.

Young in first plumage. Throat dull pale rufous-brown with only faint signs of spotting; above like the adult but duller; the crown is vermiculated rather than spotted with black; the sides

are vermiculated with brown and black; the centre of the breast and abdomen are paler and whitish.

Young in semi-adult plumage are profusely spotted with white all over the breast, abdomen and flanks, otherwise like the adult but with rather rufous chin and throat and the legs, orbital and gular skin dull yellowish.

Chick in down. Rather bright chestnut-brown above, dingy white-below; supercilium and cheeks pale buffy-brown; a line of dark brown from the eye dividing the two.

Distribution. Assam East and South of the Brahmapootra and the Dibong, through Manipur, Looshai Hills, Chittagong Hill Tracts, Arrakan, Chin and Kachin Hills; it is also common in the Yunnan Hills, whence it has been recorded as *A. r. euroa* on account of the finer shaft-lines of white on the flanks. This character is individual only, though old birds generally show much finer white lines than young ones. It almost certainly occurs in the Northern Shan States but is replaced in the Southern Shan States by the next race.

Nidification. This Hill-Partridge breeds from April to June between 2,000 and 6,000 feet, rarely ever lower than this. The nest varies greatly; sometimes it is placed in grass two or three feet high, a depression among the roots being selected where the grass is fairly dense, which is well lined with a good thick pad of soft green blades. Round this the living grass is so arranged that it forms sides and roof, completely enclosing the nest, whilst at the front it is beaten down and a little tunnel a few inches long worked through it, by which the birds leave or enter the nest. Occasionally nests are just masses of bamboo-leaves under the shelter of bamboo-clumps, the eggs shining up very conspicuously when the bird leaves them exposed. Intermediate nests are hollows well lined with leaves etc. and placed under the shelter of a rock or bush or well hidden in among the undergrowth of evergreen-forest. The number of eggs laid is undoubtedly most often four, occasionally three, five or six and possibly, though I have never seen such, clutches of seven or eight may be laid. One hundred and fifty eggs average 39·2 × 29·8 mm.: maxima **44·0** × 31·0 and 43·1 × **33·0**; minima **33·4** × **26·6** mm.

Habits. This fascinating little bird lives in almost any kind of cover; evergreen-forest with dense undergrowth, pine-forest with none at all, scrub-jungle or long grass but it undoubtedly prefers stunted evergreen-forest, much broken up with rocks and ravines and with plenty of small spaces more or less clear of all undergrowth, where it can wander about hunting for its food of seed, berries and insects. They are monogamous and the small coveys probably always consist of the old birds and their last brood. They are active and quick, yet very quiet and sedate in their movements; as a rule, the members of the party keep close together and then they only utter a soft whistle from time to time or croon a few chuckling notes but, if they get far apart, they call loudly to one another in

a note very similar to their breeding challenge-note, a startling but musical "Wheea-whip" which can be heard at an immense distance. They fly well and fast and twist in and out of trees in heavy forests with remarkable speed, affording very sporting and difficult shots, though they are not numerous enough to make the special pursuit of them worth while. They are very good-eating, though rather dry."

(1964) Arborophila rufogularis tickelli.

THE TENASSERIM RUFOUS-THROATED HILL-PARTRIDGE.

Arboricola tickelli Hume, Game-Birds, ii, p. 77 (1880) (Muleyit, Tenasserim).

Arboricola rufigularis (part.). Blanf. & Oates, iv, p. 126.

Vernacular names. *Toung-kha* (Burm.).

Description. Similar to *A. r. rufogularis* but with no black band below the rufous throat; the white of the cheeks and the cheek-stripe is perhaps purer and the lower parts are paler with a greater extent of white on the abdomen. The male and female seem to be exactly alike.

Colours of soft parts. "The legs and feet appear to be always much paler" (than in the Himalayan race), "a pinky and not a bright red" (*Hume*).

Measurements. Wing, ♂ 138 to 148 mm., ♀ 132 to 146 mm.

Distribution. Tenasserim, South Shan States, Karen-ni; possibly also North and West Siam and North Malay States.

Nidification. Unknown in a wild state. Hens in the aviaries of Mr. Barnby Smith made two nests, one just a hollow with a pad of grass, the other a well-hidden nest with sides and dome formed of the living grass round it. These aviary birds had the same habit as the wild ones of screening the exit from their nest with a little grass whenever they left it. Four eggs of the usual character were laid, measuring 1·6 × 1·2" (=40·6 × 27·5 mm.).

Habits. As far as recorded very similar to those of the other races. They roost at night well up in trees or bamboos, keep in small coveys of ten to twelve birds and have the loud double whistle of the genus "commencing very soft and low, but gradually becoming more and more rapid, and rising higher and higher, until, at last, the bird has to stop. As soon as one stops, another takes it up" (*Davison*).

(1965) Arborophila atrogularis.

THE WHITE-CHEEKED HILL-PARTRIDGE.

Arboricola atrogularis Blyth, J. A. S. B., xviii, p. 819 (1849) (Assam).

Arboricola atrigularis. Blanf. & Oates, iv, p. 127.

Vernacular names. *Peura* (Sylhet); *Du-boi*, *Dubore* (Assam); *Sun-batai* (Chittagong); *Dao-bui* or *Dao-bui-gegashi* (Cachari); *Inrui-whip* (Kacha-Naga); *Toung-kha* (Burm.); *Wogam* or *Gam-toung* (Kachin).

Description.—Male and female. Forehead grey, changing to olive-brown on the crown and to rufous on the nape, each feather with a broad black spot; the grey forehead produced back to form a supercilium, below which is a black line meeting the black lore and upper cheeks; back, rump and upper tail-coverts light olive-brown, the feathers tipped and barred with black; scapulars the same but more grey; innermost secondaries also similar but with bold terminal black bars and edged and mottled with rufous; wing-coverts olive-grey mottled with brown and sometimes, especially on the greater coverts, with rufous; quills brown, secondaries mottled with rufous and brown on the outer webs, which are greyish towards the tips; tail mottled olive and brown; cheeks white, passing into rufous on the posterior ear-coverts, which have a few fine shaft-lines of black; chin, throat and fore-neck black; lower neck black and white; breast and flanks grey, passing into whitish on the centre of the abdomen; posterior flanks with white drops; under tail-coverts rufescent, edged with white and spotted with black.

The spotting on the flanks varies greatly. In one Assam bird there are also bold black-and-white spots on the breast but other birds from the same district are quite normal.

Colours of soft parts. Iris brown or red-brown; bill black; orbital and gular skin bright pink, becoming brilliant deep red in the breeding-season; legs dull orange to a bright orange-red, or red, during the Spring and Summer; in the female the bill is dark brown and the legs vary from dull wax-yellow to dark wax-yellow tinged with red.

Measurements. Total length about 275 mm.; wing, ♂ 135 to 147 mm., ♀ 126 to 130 mm.; tail about 60 to 65 mm.; tarsus about 42 to 44 mm.; culmen 18 to 20 mm.

Distribution. Assam South of the Brahmapootra: Dafla and Miri Hills, North of that river (*Stevens*); Cachar, Sylhet, Tippera and Arrakan into the Chin and Kachin Hills (*Anderson*); Myitkyna, Ruby Mine, at 2,500 feet (*Whitehead*); Kamdoung (*Bateman*). Coltart and I both found it extremely common in Lakhimpur and Sadya in Assam, both North and South of the Brahmapootra and East of the Dibong.

Nidification. This Hill-Partridge is the low-level representative of the genus, 5,000 feet being about its maximum breeding-elevation, whilst it is common only at and below 3,000 feet, spreading right into the plains wherever the ground is broken up and there is sufficient cover. Wherever found it breeds, commencing in April and laying up to the middle of June. The nest varies—sometimes it is just a hollow filled with leaves and grass, whilst at other times it is a most elaborate affair with the growing grass all round wound, twisted and bent into a complete canopy. In such a nest there is nearly always a thick pad of grass for the eggs to rest on and a neat tunnel of grass as an entrance, closed carefully whenever the bird leaves it. Four eggs is the normal

full clutch, sometimes three or five and, it is said, occasionally up to seven. One hundred eggs average 37·6×28·4 mm.: maxima 42·4×30·8 mm.; minima 32·4×26·2 mm. The hen bird is a very close sitter and once incubation commences will not leave until almost trodden on.

Habits. This species frequents both the plains at the foot of the hills and the hills themselves up to 5,000 feet but is most numerous below 2,000 feet. It spreads far into the plains where these are broken up and have small hills, intersected with ravines and patches of cultivation. Otherwise its habits are those of the genus, except that it prefers bamboo, scrub and grass cover to tree-forest.

(1966) Arborophila mandellii.

THE RED-BREASTED HILL-PARTRIDGE.

Arborophila mandellii Hume, Str. Feath., ii, p. 449 (1874) (Bhutan Duars).

Arboricola mandellii. Blanf. & Oates, iv, p. 128.

Vernacular names. *Pao-er* (Chulikatta Mishmi).

Description.—Male and female. Lores, forehead and fore-crown dull chestnut, shading into brown on the hind-crown and nape; pure dark grey superciliary stripes from the eye meeting on the upper neck; lower neck and extreme upper back chestnut-ferruginous with black spots; back, rump, upper tail-coverts and tail olive with narrow black edges and all but the back with bold black central spots to the feathers; scapulars and wing-coverts like the back but with still finer black bars; wing-quills brown; inner secondaries and greater coverts with chestnut edges, faint grey patches and bold black terminal spots; chin and throat pale olive-chestnut, followed by white and black rings; a small white moustachial streak; sides of head darker chestnut, forming a collar with the chestnut on the neck and spotted with black in the same way; upper breast rich deep chestnut; lower breast to vent grey, the flanks marked with chestnut in varying degree and more or less spotted with white; centre of abdomen paler and sometimes tinged with ashy; under tail-coverts olive with white spots and rufous tips and mottlings; thigh-coverts and posterior flanks sometimes olive with black centres and rufous markings.

Colours of soft parts. Iris brown to red-brown; bill black; legs reddish.

Measurements. Wing 133 to 145 mm.; tail 56 to 58 mm.; tarsus 43 to 45 mm.; culmen 19 to 20 mm.

Distribution. Hills North of the Brahmapootra from Sikkim and Bhutan to Eastern Assam. Bailey obtained it in the Upper Dibong Valley and Needham in the hills above Sadya.

Nidification. My collectors sent me four eggs with the skin of a female, trapped on the eggs which were taken on the 3rd June

in the Chambi Valley at an elevation of about 8,000 feet. The eggs were laid on a pad of grass under shelter of a rock in evergreen-forest composed of oak- and rhododendron-trees, the ground very steep and rugged, much split up into small ravines and very wet and humid. The eggs measure about 44·0 × 34·4 mm. and are probably rather unusually large.

Habits. Those of the genus. This species is supposed to keep between 1,000 and 6,000 feet but evidently often ascends much higher than this. The Arbors knew it and said they habitually snared them in summer on some hills above Sadya which ran between 8,000 and 10,000 feet. It was obtained at over 7,000 feet in the Mishmi country and Macdonald trapped it at 8,000 feet in the Chambi Valley. It appears to be a rare bird, keeping to dense evergreen-forest.

(1967) Arborophila brunneopectus brunneopectus.

THE BROWN-BREASTED HILL-PARTRIDGE.

Arboricola brunneopectus Tick., Blyth, J. A. S. B., xxiv, p. 276 (1855) (Tenasserim); Blanf. & Oates, iv, p. 128.

Vernacular names. *Wo-gam* (Kachin); *Toung-kha* (Burm.).

Description.—Male and female. Forehead and broad supercilia continued down the sides of the neck buff, paler on the neck; lores, the lines above and below the eye and a broad patch on each side of the neck black; crown olive-brown, each feather black-tipped, the black spots sometimes coalescing to make the whole crown black; nape generally blacker than the crown; back, rump and upper tail-coverts bright olive-brown with black bars, varying a great deal in width, but always well defined on the rump and upper tail-coverts; tail olive-brown with black mottling; scapulars, wing-coverts and inner secondaries chestnut with black drops or bars and large oval patches of pale olive-brown; primaries brown, mottled near the tips with rufous; outer secondaries the same with broad rufous edges turning to chestnut on those next the innermost; chin, cheeks and ear-coverts white or buffy-white; fore-neck sparsely covered with black feathers with narrow white bases; breast and flanks brownish-buff, the feathers edged rufous and with black bases which sometimes show through; flanks with round white spots and black bars; abdomen almost white; under tail-coverts pale buff with broad black bars or spots.

Colours of soft parts. Iris dark brown; eyelids, orbital and gular skin bright red, red-lake, or bright fleshy-red; bill brownish-black or black; legs bright pale red.

Measurements. Total length about 280 mm.; wing, ♂ 132 to 151 mm., ♀ 122 to 139 mm.; tail about 60 to 70 mm.; tarsus about 39 to 42 mm.; culmen 20 to 21 mm.

Distribution. Pegu and Eastern Burma, North to the Ruby Mines, Karen Hills, West and North-West Siam, Southern Shan States and Yunnan.

Nidification. Hasington obtained four eggs of this Partridge on the 5th June at Taukchan, near Rangoon. They were laid on the ground in a hollow filled with bamboo-leaves in open bamboo-jungle. They measure between 33·8 × 28·4 and 37·6 × 28·5 mm.

Habits. Like the last species this also is a bird of low levels keeping to very similar country from the plains up to 5,000 feet. They seem to prefer evergreen-forest, however, to scrub- and bamboo-jungle, though they may be met with in these also. Tickell says that they make a curious low "pur-r-r," not unlike the call of the Button-Quail but its usual note is the loud double whistle of the genus.

Genus **TROPICOPERDIX.**

Tropicoperdix Blyth, J. A. S. B., xxviii. p. 415 (1859).

The birds of this genus are distinguished from those of the genus *Arborophila* by the absence of the chain of superorbital ossicles and by having a patch of downy white feathers on either side behind the axilla.

Sexes alike.

Key to Species.

A. Breast olive-brown, with wavy bars of black..	*T. chloropus*, p. 397.
B. Upper part of breast chestnut.....	*T. charltoni*, p. 398.

(1968) **Tropicoperdix chloropus.**

THE GREEN-LEGGED HILL-PARTRIDGE.

Tropicoperdix chloropus Tickell, J. A. S. B., xxiv, p. 415 (1859) (Tenasserim); Blanf. & Oates, iv, p. 129.

Vernacular names. None recorded.

Description. Feathers of forehead, lores and supercilia dark brown with white outer webs; the supercilia changing to pale buff with dark edges on the sides of the neck; crown and nape brown, in some tinged olive, in others more rufous; upper parts brown, tinged with rufous, with narrow crescentic black bars, the rump and upper tail-coverts also stippled with black and mottled with buff; tail rufous-brown barred and mottled with black; wing-coverts, scapulars and inner secondaries like the back but with a few paler mottlings and more rufous on the secondaries; primaries brown; axillaries white; under wing-coverts brown and white; a tuft of downy-white feathers on each flank; chin, throat and sides of head white, each feather with a black spot at the tip; neck and sides bright rufous, similarly spotted; breast brown like the back, immaculate next the neck, with wavy black bars on the upper breast changing to ferruginous-red on the lower breast and

to pale rufous white on the abdomen; flanks brown, mottled, barred and streaked with fulvous and black; the black extends on to the lower breast as edgings to the feathers.

Colours of soft parts. Iris brown or red-brown; bill apple-green or grass-green, dusky red at the base and darker at the tip; eyelids and orbital skin purple-red; legs dull greenish, greenish-yellow or apple-green.

Measurements. Wing, ♂ 152 to 166 mm., ♀ 148 to 158 mm.; tail about 76 mm.; tarsus about 43 to 45 mm.; culmen 18 to 19 mm. "Weight 8 to 10 oz." (*Hume*).

Distribution. Eastern Pegu and Tenasserim, South to Tavoy. East it extends into Cochin China and Assam through Siam. North it was obtained by Harington and Whitehead at Bhamo, Khamaing and Myitkyna, whilst Nisbet got it as far North as Katha.

Nidification. Unknown.

Habits. This Partridge frequents both dense evergreen-jungle, in which Oates always found them, and thin deciduous and dry forests. Tickell says that it avoids mountains and hills and prefers low hills and undulating land but Harington, Whitehead and others found them in the thickest evergreen-forests at considerable elevations up to 5,000 feet. The note has not been described but otherwise their habits are much like those of the genus *Arborophila*.

(1969) Tropicoperdix charltoni charltoni.

THE MALAY GREEN-LEGGED HILL-PARTRIDGE.

Perdix charltoni Eyton, Ann. Mag. Nat. Hist., (1) xvi, p. 230 (1845) (Malacca).

Vernacular names. *Sang serok* (Malayan).

Description.—Adult male. Upper plumage and wings similar to that of the preceding bird but from back to rump and tail the whole surface more or less vermiculated with black, grey and dull buff, the first also forming inconspicuous bars; the chin, throat, forehead and broad supercilium are white with black markings and there is no tinge of rufous on these parts nor on the hind-neck; lower cheek white with black spots; ear-coverts and a patch behind them golden-rufous; behind this again a broad black patch down the sides of the neck; chest deep maroon-chestnut; breast and anterior flanks buff with narrow bars of brownish-black next the chestnut, this becoming deeper black and much broader posteriorly; lower head and upper abdomen deep rufous, becoming almost pure white on the posterior abdomen, vent and under tail-coverts, the last barred and edged with black and rufous.

Colours of soft parts. Iris brown; bill olive or sap-green to black; orbital skin blood-red; legs and feet sap-green to dull yellow or yellowish-green.

Measurements. Wing 158 to 165 mm.; tail 66 to 74 mm.; tarsus about 36 to 40 mm.; culmen 15 to 16 mm.

Female. Like the male but with less chestnut on the lower plumage.

Distribution. Tenasserim, South Siam, Malay States. The specimens in the British Museum labelled Penang are probably all from Perlis on the Peninsula opposite Penang, as the bird does not occur in that island.

The race from Annam with differently coloured ear-coverts and marked with black drops instead of bars on the breast and flanks has been named *tonkinensis* by its discoverer, Delacour.

Nidification. Unknown.

Habits. This is a Partridge of the low country, keeping to dense forest and scrub, very shy and retiring and most difficult to observe though easy to trap. So far as is recorded, the habits seem very similar to those of the genus *Arborophila*.

Genus **CALOPERDIX.**

Caloperdix Blyth, Ibis, 1867, p. 160.

Type, *Perdix oculea* Temm.

The genus *Caloperdix* differs from both *Tropicoperdix* and *Arborophila* in the formation of the legs. The tarsus is considerably longer than the middle toe and claw together and is armed with one or more spurs. The toes are short and the claws, though straight, are not as long as they are in the other genera. From *Tropicoperdix* it also differs in having no superorbital ossicles; the wing is shaped as in *Arborophila* and the tail consists of fourteen feathers.

The species ranges from Java, Borneo and Sumatra, through the Malay Peninsula into South-Western Siam and Tenasserim.

(1970) **Caloperdix oculea oculea.**

THE FERRUGINOUS WOOD-PARTRIDGE.

Perdix oculea Temm., Pig. et Gall., iii, pp. 408, 732 (1815) (India, Malay Pen.).
Caloperdix oculea. Blanf. & Oates, iv, p. 131.

Vernacular names. None recorded.

Description. Whole head, neck and lower parts bright ferruginous-red, the crown deeper and more chestnut; chin, throat and sides of head albescent and supercilia paler chestnut; upper back black, with two sharply-defined white bars on each feather; lower back, rump and upper tail-coverts black with bright rufous-pink V-shaped central markings; tail black, the central rectrices with narrow red terminal rufous bars; scapulars, wing-coverts and innermost secondaries light olive-brown with bold black subterminal

spots; quills grey-brown, the outer secondaries tipped and edged with rufous mottlings, flanks black with white bars; posterior flanks ferruginous with black drops; centre of abdomen and vent whiter; under tail-coverts pale ferruginous and black.

Colours of soft parts. Iris dark brown; bill black; legs and feet pale dirty green to clear apple-green.

Measurements. Total length about 275 mm.; wing, ♂ 143 to 151 mm., ♀ 131 to 140 mm.; tail about 65 to 70 mm.; tarsus about 47 to 48 mm.; culmen 20 to 21 mm.

Distribution. South Malay Peninsula to near Malacca; South-West Siam. Hopwood defines their northern limits as the Dounat Range, which forms the watershed of the Tavoy, Ye and Thoungyin Rivers.

Nidification. A nest found by Robinson at the end of May is said to have been like a well-made nest of *Arborophila*, a matted pad of grass under the shelter of a scrubby bush. The single egg it contained was a glossy pure white.

Habits. Very little recorded but it appears to frequent very dense humid jungle, feeding on berries, seeds and insects. Hopwood found about twenty together feeding on the ground on fallen wild figs but thinks these were merely collected together, owing to the abundance of food, as at other times he found them singly or in pairs.

Genus **RHIZOTHERA**.

Rhizothera Gray, List Gen. Birds, 2nd ed., p. 79 (1841).

Type, *Perdix longirostris* Temm.

The genus *Rhizothera* contains a single species of Partridge at once distinguished from all others by its long, heavy and much bent down bill. The tail has twelve feathers; the wing is short and rounded, the first primary about equal to the tenth and the fifth and sixth subequal and longest; the tarsi are stout and long and are furnished with short blunt spurs in both sexes; the claws are straight and small and there is a small hind claw. The sexes differ from one another in coloration.

(1971) **Rhizothera longirostris longirostris.**

THE LONG-BILLED WOOD-PARTRIDGE.

Perdix longirostis Temm., Pig. et Gall., iii, pp. 323, 721 (1815) (N. Sumatra).

Vernacular names. Selanton (Malay).

Description.—Adult male. Crown and nape rich chocolate-brown, palest on forehead; lores, supercilia, sides of head and neck rusty chestnut; a line from the nostrils through and over the eye black; a second black line at the edge of the base of the

upper mandible; back of the neck grey, the feathers broadly edged with velvety-black and with a few longitudinal and cross bars of chestnut; upper back reddish-brown with black blotches, the feathers margined with rufous on either web; the feathers on the sides of the back with pale buff central streaks; lower back and rump vermiculated buff and pale grey with a few scattered black specks and spots; upper tail-coverts the same, but more rufous and the mottlings on the latter forming ill-defined bars; scapulars buff with rufous-brown edges and grey mottling; innermost secondaries chestnut-brown with deep red edges, black spots on the inner webs, buff tips and much mottled with buff and grey; wing-coverts buff, mottled with grey and brown; primaries brown mottled with chestnut-buff on the outer webs; outer secondaries buff with mottled brown bars; chin and throat pale rusty chestnut; neck and upper breast grey, changing to rufous-buff on the lower breast and flanks and again to almost pure white on the vent and abdomen; under tail-coverts pale rufous.

Colours of soft parts. "Iris burnt umber; bill black; legs lemon-yellow" (*Herbert*).

Measurements. Length about 220 mm.; wing 189 to 211 mm.; tail 80 to 90 mm.; tarsus about 55 to 63 mm.; culmen 28 to 33 mm.

Female. The grey of the neck and breast is replaced by rufous-chestnut; the rump, upper tail-coverts and tail are more rusty and less grey; the rusty colour of the lower plumage is deeper and more extensive.

Measurements. Wing 180 to 202 mm.; culmen 24 to 33 mm.

A young male has traces of barring on the flanks and breast and probably this barring is still stronger in younger birds; otherwise this specimen is like the female.

Distribution. South-West Siam and Tenasserim through the Malay Peninsula to Sumatra and West Borneo.

Nidification. Nothing recorded.

Habits. Robinson says that this Partridge is common over the whole of the Malay Peninsula in heavy jungle, preferring dense dry jungle in which there is much bamboo, up to 4,000 feet. Its note is a loud clear whistle, often heard at night.

Genus **ALECTORIS.**

Alectoris Kaup, Natürl. Syst., p. 180 (1829).

Type, *Tetrao petrosus* Gmelin.

In *Alectoris* the sexes are alike. They are Partridges of moderate size, with red legs and almost uniform upper plumage but have the flanks conspicuously barred with black and chestnut. The tail is of fourteen feathers, rounded and equal in length to about two-thirds the length of the wing; the latter is short and

rounded, the first primary equal to the fifth or sixth and the third longest; the tarsus is long and well developed and the male has a small spur. The genus is represented throughout Europe, Northern Africa and all West and Central Asia.

Alectoris græca.

Perdix græca Meisner, Syst. Verz. Vög., p. 41 (1804).

Type-locality: Greece.

Our Indian races of this species differ from the European typical *græca* in having white lores and chestnut ear-coverts.

Key to Subspecies.

A. Darker.
  a. Crown conspicuously red-brown; pink of upper back very bright ..... *A. g. koriakovi*, p. 404.
  b. Crown not so conspicuously red-brown and pink of upper back duller ..... *A. g. chukar*, p. 402.
B. Paler everywhere, above and below ..... *A. g. pallescens*, p. 404.

(1972) Alectoris græca chukar.

THE CHUKAR.

Perdix chukar Gray, Hardw. Ill. Ind. Zool., i, pl. 54 (1830–2) (India, Nepal).
Caccabis chucar. Blanf. & Oates, iv, p. 131.

Vernacular names. *Chukar* (Hind.); *Kabk* (P.); *Kau-kau* (Kashmir); *Chukru* (Chamba); *Zarkar* (Pushtu).

Description. Forehead and lines through the eye, down the neck and meeting as a gorget between the throat and the upper breast black; forehead and indistinct supercilium grey, the latter albescent posteriorly; crown vinous-red, changing to ashy on hind-neck; back and scapulars vinous-red, grading into ashy on the lower back, rump and upper tail-coverts; tail-feathers ashy-drab, all but the central pair pale chestnut on the terminal half; outer scapulars with pure pale grey centres; lesser, median coverts and inner secondaries like the back; outer wing-coverts ashy; primaries and secondaries brown with a yellowish buff patch on the centre of the outer webs; ear-coverts dull chestnut; point of chin and angle of gape black; lores, cheeks, chin and throat white, tinged with buff to a varying extent; below the black gorget the breast is ashy, more or less tinged with vinous-brown at the sides, the lower breast a purer grey; abdomen, vent, thighs and lower tail-coverts chestnut-buff or buff; flanks grey at the base, with two black bars divided by grey and with chestnut tips.

Colours of soft parts. Iris brown, yellowish or orange; the eye-lids brick-red to crimson; bill coral-red to crimson, dusky on the culmen and about the nostrils; legs and feet coral-red to deep red; claws dusky brown.

Measurements. Wing 146 to 180 mm.; tail 78 to 105 mm.; tarsus 41 to 52 mm.; culmen 19 to 21 mm. "Weight, ♂ 19 to 27 oz., ♀ 13 to 19 oz." (*Hume*).

Young bird in first plumage dull brownish-grey, each feather above with white tip and two black subterminal spots; head rather more rufescent; tail grey with mottled bars of black and white, the outer feathers tinged with rufous; below dirty brownish-white with faint brown bars.

Chick in down. Crown pale bright rufous; above pale fulvous with four stripes of speckled rufous and black; wings pale fulvous mottled rufous and black; below pale fulvous, a little darker on the chest.

Distribution. Throughout the Himalayas, as far East as Nepal, and in the hilly parts of the Punjab. It does not range West to Sind and Baluchistan or North to Ladak and Northern Kashmir.

Nidification. The Chukar breeds from the foot-hills up to 15,000 and even 16,000 feet but most commonly between 4,000 and 10,000 feet. Birds breeding in the lowest ranges lay from the end of March to May, those between 4,000 and 7,000 feet in the middle ranges in April to early June, whilst those in the highest ranges do not commence laying until June and eggs may be found in August. The nest is a hollow made in the ground under shelter of a rock or bush or among the roots of grass. Sometimes a thick pad of leaves or grass is collected as a bed for the eggs; at other times there is nothing but a little wind-blown rubbish. One nest found by Whistler was built on the top of a pollard-willow by a roadside. The eggs number seven to twelve or fourteen but occasionally far more are laid and Osmaston has taken twenty in a nest. In colour the eggs are a pale yellowish- or grey-stone colour, very rarely with a tinge of café-au-lait, whilst the marking consists of freckles of light reddish scattered all over the surface but nowhere very numerous. Two hundred and fifty eggs average 43·0 × 31·4 mm.: maxima **48·2** × 32·1 and 46·1 × **33·1** mm.; minima **37·6** × 30·4 and 39·0 × **29·0** mm. Osmaston records that eggs are laid on alternate days.

Habits. The Chukar is a bird of open country of any kind but is not found in any sort of forest, though it frequents wide stretches of grass-land more or less surrounded by Pine and other woods. In parts of the North-West it is found in the barest, most inhospitable country, keeping to rocky hill-sides, ravines and boulder-strewn plateaus but it is equally common in other parts where there are grass-lands and cultivation. It is found up to the snow-line, working upwards in summer as the snow recedes to 14,000 and 16,000 feet. They collect in flocks of a dozen or so up to thirty but sometimes far more and Wilson (Mountaineer) mentions flocks of a hundred birds. They form good shooting, flying well and strongly, not difficult to flush, whilst the flocks often scatter after first rising and afford several shots when again

put up. They live mainly on seeds but eat insects, grubs, worms, etc., and are themselves well flavoured but rather dry for the table. Ten or twelve brace are sometimes obtained in a day's shoot but anything over twenty is exceptional. During the breeding-season they are very pugnacious and their challenge may be heard ringing out from one hill-side to another. Hume syllabifies their call as "I'm here, I'm here; who's dead, who's dead; oh lor, oh lor."

(1973) Alectoris græca koriakovi.

THE PERSIAN CHUKAR.

Caccabis kakalik koriakovi Zarudny, Men. Orn., p. 53 (1914) (E. Persia).
Caccabis chucar. Blanf. & Oates, iv, p. 131 (part.).

Vernacular names. None recorded.

Description. Differs from the proceding bird in having the whole plumage rather paler and brighter, the red-brown and the crown and pinky-red upper back being conspicuously so; the breast is generally a clearer purer grey.

Colours of soft parts as in the Chukar.

Measurements. Wing 140 to 156 mm.

Distribution. Eastern Persia to Baluchistan and Sind. I do not think Hartert's *H. g. kirthari* is separable from this form now that we have larger series of the various races for comparison.

Nidification. This race of Chukar breeds between 5,000 and 12,000 feet in Persia and Baluchistan. In Quetta Betham took its eggs in June but it lays as early as the first week of April in other parts of Baluchistan, whilst in Persia it breeds from the end of April to June. Nest and site are much like those of the last bird and the number of eggs laid varies from eight to eighteen and cannot be distinguished from those of the Indian Chukar, though they average paler and smaller. Fifty eggs average 39·0 × 29·3 mm.: maxima **43·0** × 30·2 and 42·3 × **31·5** mm.; minima **35·2** × 28·2 and 38·0 × **26·4** mm.

Habits. Those of the genus.

(1974) Alectoris græca pallescens.

THE NORTHERN CHUKAR.

Caccabis pallescens Hume, Lahore to Yar., p. 283 (1873) (Karbu in Ladak).
Caccabis chucar. Blanf. & Oates, iv, p. 131 (part.).

Vernacular names. *Chukar* (Hind.); *Keklik* (Turki.).

Description. Differs from either of the two preceding birds in its generally much paler coloration.

Colours of soft parts as in the other races.

Measurements. Wing 158 to 172 mm.

Distribution. The Pamirs, Gilgit and extreme North of Kashmir, Leh, Ladak, Eastern Turkestan and Yarkand.

Nidification. Osmaston and Ward both took eggs of this subspecies in Ladak in the last fortnight of July. The eggs, 12 and 10 respectively, were laid in depressions in the ground lined with a little grass and screened from view by Berberis-bushes. The twenty-two eggs average 44·4×31·7 mm.: maxima 45·8 × 31·1 and 45·1 × 33·1 mm.; minima 43·0 × 31·0 and 43·5 × 30·1 mm. Osmaston's nest was taken at an elevation of about 14,500 feet.

Scully took eggs in Eastern Turkestan as low as 6,000 ft. and again at 12,000 ft. The eggs are, beyond being so large, indistinguishable from those of the other races.

Habits. Those of the species. Scully found it common near Willow-bushes and streams in Eastern Turkestan and this predilection for streams seems to be a trait of all three races, though at the same time they are often found far away from water.

Genus **AMMOPERDIX**.

Ammoperdix Gould, B. of Asia, vii, pl. i, part iii (1851).

Type, *Perdix bonhami* Fraser = *A. griseogularis* Brandt.

The genus *Ammoperdix* contains two species of small Partridges extending from North-East Africa to South-West Asia as far as North-West India.

The tail of twelve feathers is short, not exceeding half the length of the wing; the latter is rounded, the third or fourth primary the longest, the first, second, fifth and six graduated; the tarsi are strong and of fair length, there are no spurs but the male occasionally has a small knob or incipient spur on one or both legs; the bill has a distinct cere, brighter in colour than the rest of the bill.

The sexes differ from one another in coloration.

(1975) **Ammoperdix griseogularis griseogularis.**

THE SEESEE PARTRIDGE.

Perdix griseogularis Brandt, Bull. Acad. St. Peter, i, p. 365 (1843) (Transcaspia).
Ammoperdix bonhami. Blanf. & Oates, iv, p. 133.

Vernacular names. *Sisi* (Sind, Punjab); *Tahu* (Persian).

Description.—Adult male. Forehead, supercilium and a narrow line under the eye black; lores and behind the eye white, turning to rufous behind the ear-coverts; crown and nape ashy-grey, turning to vinous-red on the centre of the

head-neck, which is obsoletely barred with grey; back and interscapulars vinous-red, profusely marked with wavy bars of grey; lower back, rump, upper tail-coverts and central tail-feathers vinous-buff, very finely vermiculated with grey and with small central black arrow-heads; outer tail-feathers chestnut, with paler faintly-vermiculated tips; wings like the back, the primaries and secondaries light brown, all but the first barred with pale buff on the outer webs; sides of neck grey with broad white triangular spots; chin fulvous-white changing to ashy-grey on the throat, sides of head and fore-neck; breast vinous-buff, becoming more distinctly vinous on the lower breast and flanks and more yellow on the centre of abdomen and under tail-coverts; the feathers of the flanks and sides of the abdomen have internal edges of black and broad external margins of chestnut, paling to pearly-white.



Fig. 51.—Head of *A. g. griseogularis*. ½.

Colours of soft parts. Iris bright yellow, orange, orange-brown, dull red or light brown; bill orange, dusky on the culmen, in some orange-horny; cere orange, orange-red or brownish in the non-breeding season; legs and feet dingy wax-yellow, greenish-yellow or dusky yellow, claws pale brown.

Measurements. Total length about 250 to 270 mm.; wing 123 to 139 mm.; tail 60 to 68 mm.; tarsus 32 to 34 mm.; culmen about 11·0 to 12·5 mm. "Weight 7 to 8 oz." (*Hume*).

Female. Head like the back, which is similar to that of the male but with no red tinge; the wing-coverts are less finely marked and the inner secondaries are much marked with brown; the lower parts are coloured like the upper but paler, the throat and abdomen being albescent and the under tail-coverts buff.

Measurements. Wing 123 to 133 mm.

The depth of red or grey tinge in individual males varies considerably but to the same extent whether these are from Persia, Sind or the Punjab.

Distribution. Greater part of Persia, West to Berejik and Kamkale on the Euphrates, North to Trancaspia and Bokhara: Afghanistan, Baluchistan, Sind and East to the Khuriar Hills and the Salt Range in the Punjab. In Arabia and Western Mesopotamia it is replaced by a paler, more grey race, *A. g. termeulis* Zarudny.

Nidification. The See-see breeds over the whole of its range from the foot-hills up to about 6,000 or 7,000 ft. during the months of April, May and June. The site selected may be either on a quite open hill-side or it may be in a ravine; in the latter case it is often well protected by an overhanging rock or bush but in the former it is merely placed on the shady side of some stone rather larger than the rest or under some scant tuft of withered grass or meagre bush. No nest is made, the hollow scratched out by the birds themselves having no lining or, at most, a very scanty one of grass and leaves. Five to fourteen eggs are laid, generally six to nine, pale cream or yellowish-stone in colour, smooth and fine in texture but generally quite glossless. Sixty eggs average 34·9×25·6 mm.: maxima 38·7×26·8 and 37·3×28·3 mm.; minima 32·0×24·6 and 34·4×23·5 mm.

Habits. The See-see is a bird of barren stony hills and open wastes and seems curiously addicted to old ruins in deserts and has even been known to nest in roofs of old buildings. They feed almost entirely on seeds, grass-seeds being the staple food, but doubtless also eat ants and small insects from time to time and almost certainly feed their young on them. Their call is a loud double whistle, from which the birds derive their name, generally uttered when the bird is perched on some high boulder or other elevated position. They fly well and afford good sport, though not big bags, and when shot are not bad-eating.

Genus **FRANCOLINUS**.

Francolinus Steph. in Shaw's Gen. Zool. xi, pt. ii, p. 316 (1848).

Type, *Tetrao francolinus* Linn.

This genus contains a very large group of Partridges represented by various species and subspecies almost throughout temperate and tropical Europe, Africa and Asia. In general appearance they are very like the true Partridges of the genus *Perdix* but have only fourteen tail-feathers instead of sixteen or eighteen. The legs are both longer and stouter and in the males are furnished with a spur, sometimes, however, very small or obsolete; the wing is about one-quarter to one-third longer than the tail, but is short and rounded; the third or fourth primary is longest, the fifth and sixth a little shorter. In some species the sexes are alike, in others dissimilar.

Key to Species.

A. Quills transversely barred or spotted with buff on both webs.
  a. Scapulars with a conspicuous buff submarginal band.
    a'. Males with chestnut collar and females with chestnut nuchal patch. *F. francolinus*, p. 408.

b'. Notches not collar or patch.....	*F. pictus*, p. 412.
b. No submarginal buff band on scapulars.	*F. pintadeanus*, p. 415.
B. Quills without transverse bars or spots.	
c. Breast buff with narrow cross-bars....	*F. pondicerianus*, p. 417.
d. Breast brown with longitudinal white stripes	*F. gularis*, p. 417.

Francolinus francolinus.

Tetrao francolinus Linn., Syst. Nat., 10th ed. i, p. 275 (1766).

Type-locality : Italy.

Key to Subspecies.

A. Darker	*F. f. asiæ*, p. 408.
B. Much paler.....	*F. f. henrici*, p. 410.
C. Darkest of all, with much black both above and below	*F. f. melanonotus*, p. 411.

(1976) Francolinus francolinus asiæ.

THE INDIAN BLACK PARTRIDGE.

Francolinus asiæ Bonap., Comp. Rend., xlii, p. 892 (1856) (Asia).
Francolinus vulgaris. Blanf. & Oates, iv, p. 135 (part.).

Vernacular names. *Kala Tetar* (Hind.); *Tetra, Kalo-Tetra* (Garhwal).

Description.—Adult male. Crown to nape sandy or rufous-brown, the feathers centred dark brown; supercilium and feathers round the eye black; a broad white band from lower lores, cheeks and ear-coverts white; chin, throat and a broad patch below ear-coverts running up to nape black; feathers of nape showing a little black-and-white mottling; a broad chestnut collar all round the neck; behind the collar the back and sides are black, each feather with white spots on either web; back, scapulars, smaller wing-coverts and innermost secondaries brown, each feather with a submarginal black-edged band of buff or sandy-rufous; lower back, rump, upper tail-coverts and tail black with narrow white, or fulvous-white, bars, the outer tail-feathers with the terminal third unbarred black; primaries, outer secondaries and greater coverts dark brown with spots or broken bars of rufous-buff; breast black, unspotted in very old males in the centre but with oval white spots on the sides; flanks black with larger oval white spots, rarely becoming longitudinal bars on the posterior flanks and, generally, with narrow brown fringes; lower breast and thigh-coverts black to blackish-brown, with very large white spots or bars; centre of abdomen and vent light chestnut with whitish bars; under tail-coverts chestnut, occasionally with a few white or fulvous bars; under wing-coverts and axillaries mottled fulvous and dark brown.

Colours of soft parts. Iris brown or hazel-brown; bill black or dark horny-brown, the tip of the lower mandible whitish; legs and feet reddish-brown to orange-red or brick-red; claws black or horny-brown.

Measurements. Wing 145 to 168 mm.; tail 77 to 110 mm.; tarsus about 45 to 50 mm.; culmen about 22 to 26 mm. "Weight 10 to 20 oz." (*Hume*).

Female Above similar to the male but paler and duller; the white of the head is replaced by pale buff; ear-coverts brown or buffy-brown; cheeks speckled with dark brown; the chestnut collar is reduced to a dull chestnut nuchal patch, sometimes freckled with dark brown; rump to tail dull pale brown; with narrow wavy bars of pale buff edged with black; chin, throat and fore-neck white or buffy-white; breast and flanks white or pale buff, sometimes slightly rufous, with wavy arrow-shaped bars of black, widest on the posterior flanks and lower breast, obsolete or much fewer on the abdomen; vent pale dull chestnut, sometimes with faint brown bars and sometimes with whitish tips; under tail-coverts chestnut.

Colours of soft parts as in the male but paler and duller.

Measurements. Wing 138 to 167 mm. "Weight 8 to 17 oz." (*Hume*).

Young males are like richly-coloured females but with dark, almost black, supercilia and white cheeks; the rufous nuchal patch is darker and more pronounced and the breast is black, the white spots usurping nearly all the visible parts of the feather.

Chick in first feather. Pale rufous-buff everywhere, with broad dark brown bars and spots; below pale albescent-buff with small brown spots.

Chick in down. Head bright rufous with darker crown and pale supercilia and cheeks; a dark line through the eye; above brown with a very pale buff streak on either side of the back and rump; chin whitish; neck and throat fulvous-white; rest of lower parts dull earthy-white.

Distribution. Excluding Sind and the extreme North-West Frontier of India, the whole of North India as far East as West Nepal and Behar. South it extends to Deesa, Gwalior, Sambalpur and in the Central Provinces to Saran, Udaipur and in Western Bengal to Chota Nagpur. Col. Sparrow found it common near Trimulgherry in the Deccan.

Nidification. The Indian Black Partridge breeds from April to July but Whymper took hard-set eggs near Naini Tal on the 21st October, probably a second laying. The nest generally consists of a little grass at the bottom of some hollow scratched out by the birds, in among the roots of grass in extensive grass-covered flats or uplands, less often in scrub-jungle. Occasionally the nest is more substantial, consisting of a thick pad of grass well matted together. The number of eggs varies greatly. I have

seen three hand-set and they have been recorded up to fifteen, but the normal clutch is six to eight. They vary in colour from a pale olive-brown, or olive, to a warm olive chocolate-brown, whilst an occasional clutch is yellowish-olive or yellowish-stone. In shape they are broad peg-tops with a fine close texture and often well glossed. One hundred eggs average 37·8 × 33·3 mm.; maxima **42·0** × 33·1 and 40·0 × **34·0** mm.; minima **32·3** × 30·4 and 36·0 × **29·2** mm. They breed up to 7,000 ft., at which height Dodsworth has taken them near Simla and it is very noticeable that these high-level breeding-birds lay very large eggs.

Habits. This Partridge is an inhabitant of grass-lands and scrub-jungle. Almost any grass will do if over two feet high and the longest ekra, reeds or elephant-grass, ten feet or more in height seems equally acceptable, more especially if near water. It is occasionally found in thin deciduous forest but possibly prefers grass three or four feet high, such as is found in vast stretches in many parts of India. Their food is principally seed and grain, but they eat roots, buds, insects of all kinds, worms, etc. They are very sporting birds, fly well and, for Indian Partridges, are not too difficult to flush. Their call is a most musical and cheery "che-cherree, chick-cherree" and during the breeding-season may be heard constantly through the cooler hours of the day.

(1977) **Francolinus francolinus henrici.**

THE SOUTH PERSIAN BLACK PARTRIDGE.

Francolinus henrici Bonap., Comp. Rend., xlii, p. 882 (1856) (Sind).
Francolinus vulgaris. Blanf. & Oates, iv, p. 135 (part.).

Vernacular names. *Kala-tetur* or *Kala-tetri* (Hind.); *Taru* (Pushta).

Description.—Adult male. Similar to the preceding bird but paler everywhere except the under tail-coverts which are a darker chestnut than in *F. f. asiæ* but with hardly ever any trace of barring.

Colours of soft parts as in the other races.

Measurements. Wing 164 to 175 mm., Persia and Afghanistan; 148 to 163 mm., Sind and Baluchistan.

Female paler than the female of the Indian Black Partridge.

Measurements. Wing 153 to 160 mm., Persia etc.; 149 mm., (Sind).

Chick in down. Above pale whitish-fawn, head pale fawn with narrow dark centre; below unmarked creamy-white. The chick is much less like the chick of the previous race than the adults are to one another.

Distribution. South and South-Eastern Persia to Fao and Bagdad, Baluchistan, Afghanistan and Sind. A specimen from

Chitral is of this race and probably all birds from the North-West Frontier Province also should be referred to it.

Nidification. In Persia this Partridge breeds during April and May and on the Afghan and Baluchistan frontiers in May and June, making a nest in thin scrub or in the sparse grass bordering rivers and river-beds. The eggs are like those of the other races; twenty-five eggs average 39·2 × 31·8 mm.: maxima 42·2 × 31·2 and 40·1 × 33·4 mm.; minima 31·4 × 29·7 mm.

Habits. Except that this race frequents more dry and arid areas than the last bird, its habits are much the same. In Persia it is said to keep principally to Tamarisk-jungle and the grass growing on the banks of the rivers.

6 (1978) Francolinus francolinus melanonotus.

THE ASSAM BLACK PARTRIDGE.

Francolinus melanonotus Hume, Str. Feath., xi, p. 305 (1888) (Assam).
Francolinus vulgaris. Blanf. & Oates, iv, p. 135 (part.).

Vernacular names. *Kais-teiur* (Nepal); *Tetri-Sorai, Mechenteri* (Assam); *Kembi* (Manipur); *Kak* (Burma); *Dao-chirree* (Cachari); *Ihrui-jirip* (Kacha Naga); *Voh-chirree* (Mikir).

Description.—Adult male. Much darker above and below than the other races; the upper parts have the feathers centred very dark brown, sometimes almost black, whilst the paler edges are very narrow and darker rufous in colour; the white bars on the posterior upper parts are very narrow; the white spots below are oval, not round in shape, becoming still more long in shape on the lower breast, the under tail-coverts are unbarred deep chestnut.

Colours of soft parts as in the other races but the legs very bright deep red in the breeding-season.

Measurements. Wing 143 to 155 mm.

Female only differs from the Indian bird in being darker; the breast is more heavily barred with black.

Chick in down. Very deeply coloured, the dark crown broader and a deeper chestnut, the buff parts darker and richer in colour.

Distribution. Eastern Nepal, Sikkim, the whole of Assam and Eastern Bengal, Manipur, Lushai, the Hill Tracts of Chittagong and Tippera. Birds from Central and Central West Bengal are also nearest this race, as are those from Orissa, though somewhat intermediate.

Nidification. The Assam Black Partridge commences to breed in early April and continues up to the end of July, though in some cases the latest broods may be second ones, for a few birds breed in March also. The favourite nesting-places are the enormous stretches of grass-land which run all along the foot of

like very pale eggs of the Black Partridge; generally a pale stone-grey or olive-grey, never the chocolate-olive so common in the eggs of that species. Fifteen eggs average 35·9 × 30·9 mm.; maxima 37·8×31·9 and 36·5×32·0 mm.; minima 33·6×28·4 mm.

Habits. Very similar to those of the Black Partridges but the Painted Partridges prefer drier areas and keep closer to cultivation. It is said also always to roost at night on boughs of trees, on bushes or on the tops of ant-hills and boulders. The call is very similar to that of the Black Partridge and has been syllabified by Jerdon as "Chee-kee-kerray." It is said to be a better flier than the Black Partridge, to give better sport and to be a more delicate bird for the table but many sportsmen say there is but little to choose between them in these respects.

Where the ranges of the Black and the Painted Partridges overlap, hybrids are not uncommon and these seem to be genuine hybrids and not an intermediate race or form linking the various geographical races of the two into one species.

(1980) Francolinus pictus pallidus.

THE NORTHERN PAINTED PARTRIDGE.

Perdix hepburni var. *pallida* Gray, Ill. Ind. Zool., 2, pl. 55 (1830–32) (Odypore).
Francolinus pictus. Blanf. & Oates, iv, p. 137 (part.).

Vernacular names. *Titur* (Bombay); *Kala Titur* (Mahr.).

Description. Sex for sex exactly like the preceding bird but much paler. If series of *F. p. pictus* and *F. p. pallidus* are placed on their backs side by side, the differences are very obvious: the latter gives an impression of comparatively bright pale rufous, whilst the former seems to be a dull pale, rather earthy-rufous on the lower parts.

Colours of soft parts as in the preceding race.

Measurements. Wing 131 to 146 mm.

Distribution. Practically the Southern boundary of the Black Partridge is the Northern boundary of this race of the Painted Partridge. It is found as far South as Udaipore (Odeypore), Jawar, Saugur, Jhansi and Bundelkhand. The British Museum also has specimens from Gondal, Deera, Ahmedabad, Abu and Neemuch.

Nidification. Very similar to that of the preceding race but Whitehead found it breeding in Sehore in April, May and June. Elsewhere, however, August and September seem to be the principal months. Twenty-nine eggs average 35·7 × 29·5 mm.: maxima 38·3×30·1 and 36·4×31·7 mm.; minima 33·0×29·1 and 35·0×27·9 mm.

Habits. Those of the species.

Francolinus pintadeanus *.

Tetrao pintadeanus Scop., Del. Flor. et Faun., Insubr., ii, p. 93 (1786).

Type-locality: China.

The Chinese race differs from that found in Burma only in being bigger; the coloration seems identical.

(1981) Francolinus pintadeanus phayrei.

PHAYRE'S BURMESE FRANCOLIN.

Perdix phayrei Blyth, J. A. S. B., xii, p. 1011 (1843) (Arakan).
Francolinus chinensis. Blanf. & Oates, vi, p. 138.

Vernacular names. *Kha* (Burm.); *Kabaw urengbi* (Manipur); *Chay koo* (Chinese); *Nok-katah* (Siam).

Description.—Adult male. Forehead, lores, supercilium and round the eye black; ear-coverts, cheeks and below the lores white; crown and nape fulvous-buff, the central portions marked with black in varying degree; neck and back with longitudinal white streaks, gradually changing to oval spots on the back; lower back, rump, upper tail-coverts and central tail-feathers black with narrow wavy white bars; outermost tail-feathers blackish-brown with white bars on the basal halves of the outer webs; scapulars and shoulder-coverts chestnut with a certain amount of black marking and with bold white ocelli; remaining coverts brown with white ocelli; quills brown with white bars and innermost secondaries like the scapulars; moustachial streak black; chin, throat and fore-neck white or creamy-white; neck and breast black, with white ocelli on either web near the tips of each feather; lower breast the same but with the two spots merging into one or merely divided by the black shaft; posterior flanks barred brownish-black and white, or black and pale fulvous; centre of abdomen and vent pale fulvous or fulvous-white; under tail-coverts rufous-buff.

The range of variation in colour is great but appears to be purely individual. The amount of chestnut varies greatly in extent and some birds are much blacker than others.

Colours of soft parts. Iris reddish-brown to dark brown; bill black, the lower mandible horny at the base; eyelids dull greenish or livid-green; legs orange-yellow to yellowish or reddish-brown, much brighter in the breeding-season than at other times.

Measurements. Wing 132 to 151, average 144·6 mm.; tail about 60 to 70 mm.; tarsus about 42 to 44 mm.; culmen 23 to 25 mm. Weight 10 to 14 oz.

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* *Tetrao chinensis* Forster, 1771, is preoccupied by Linnæus's *Tetrao chinensis* of 1766, and cannot therefore be employed as the name of the Chinese Francolin. *Tetrao pintadeanus*, 1786, is the next name available.

Female. Head like that of the male but duller, the white replaced by dull rufous-white; upper back blackish with small white ocelli and pale brown edges to all the feathers; lower back, rump, and upper tail-coverts blackish with narrow rufous-white or rufous bars and profuse brown freckling; on the upper tail-coverts this freckling extends to the whole feather except on the pale bases with their dark bars; below white, changing to pale rufous-fulvous on flanks, vent and abdomen with bars of blackish-brown, numerous on the fore-neck and upper breast and decreasing towards the abdomen and thigh-coverts; chin and throat sometimes sparsely speckled with black.

Colours of soft parts. Legs paler and more yellow than in the male.

Measurements. Wing 137 to 146 mm.

Young birds are like the females but duller; there are central pale streaks to the feathers of the neck, back and scapulars; the eye-streak and moustachial streak are absent or obsolete.

Distribution. Manipur, Arakan, Pegu, the whole of Eastern Burma, Shan States, Yunnan and the Indo-Chinese countries. Hainan birds are quite as small as the Burmese and belong to this race and not the typical Chinese form.

Nidification. In Pegu and Lower Burma Hopwood and Mackenzie took eggs during March and April but in Northern Burma, though the former took one nest with eggs in Popa on the 14th March, the normal breeding-months seem to be July to September. The nest is the usual scrape, lined or unlined, in grass, scrub- or bamboo-jungle, the latter far more often than with the Black or Painted Partridges. The eggs number three to six, rarely up to eight and in colour vary from pale yellow-buff to a warm buff café-au-lait, never as dark as in the darker eggs of the Black Partridge. A few eggs have a faint olive tinge but such are the exceptions, not the rule, with this species. Sixty eggs average 35·3 × 29·2 mm.: maxima **40·6** × 28·3 and 38·2 × **30·5** mm.; minima **31·8** × 27·6 and 38·1 × **26·7** mm.

Habits. The Burmese Francolin keeps to the drier areas, frequenting scrub, grass-lands and bamboo-jungle and sometimes also being found in light deciduous forest. It is especially fond of partly-cultivated tracts with plenty of scrub and light tree-jungle intersecting the patches of crops. Except just after the breeding-season, they keep either single or in pairs and are decidedly difficult to flush, though once on the wing they fly strongly and afford good sporting shots. Their call is of the same character as those of the Black and Painted Partridges and has been syllabified as "kai-kai, kee-kai, kee-kurr." Their food is the same as that of other Francolins and all the genus are quite good birds for the table.

(1982) Francolinus gularis.

THE KYAH or SWAMP-PARTRIDGE.

Perdix gularis Temm., Pig. et Gall., iii, p. 401 (1815) (India, Cachar).
Francolinus gularis. Blanf. & Oates, iv, p. 141.

Vernacular names. *Kyah, Khyr, Kaijah* (Beng.); *Koi, Koera, Koi-sorai* (Assam); *Bhil-tetur, Gul-tetur* (Cachar and Sylhet); *Hoi-Koli* (Plains Mirj).

Description. Head from forehead to nape brown; lores and a narrow supercilium, widening to a broad patch behind the eye, buffy-white; whole of the rest of the upper parts brown, with bars of buffy-white edged with darker brown; on the longer upper tail-coverts and central tail-feathers the bars become vermiculations, on the whole of these parts the feathers are conspicuously white-shafted; outer tail-feathers deep chestnut with buff tips and brownish sub-tips; wing-coverts, scapulars and innermost secondaries like the back; primaries brown with chestnut on the inner webs, increasing in extent on the inner primaries and extending on to the outer webs in the innermost; the secondaries grade from the primaries to the back; a dark streak behind the eye under the supercilium; cheeks whitish, changing to rusty-chestnut on the chin, throat and fore-neck; lower parts white to pale buff, each feather with black margins and brown sub-margins, the black and brown lessening in width from breast to vent and the white increasing proportionately; vent and centre of abdomen pale rufous; under tail-coverts darker rufous; axillaries white and brown; under wing-coverts chestnut, except the smallest, which are brown and white.

The extent of rufous tinge on the lower plumage varies considerably—in some it is strong, in others absent or nearly so.

Colours of soft parts. Iris brown, crimson-brown or crimson; eyelids dull livid green or plumbeous-green; bill black, the tips horny-white; legs and feet orange-yellow to dull red, redder in the male than in the female and brighter in both sexes during the breeding-season than at other times. The male has short blunt spurs and the female also sometimes has rudimentary spurs.

Measurements. Length about 370 to 390 mm.; wing 162 to 186 mm.; tail 101 to 127 mm.; tarsus about 60 to 70 mm.; culmen about 21 to 23 mm.

Distribution. The Alluvial plains watered by the Ganges, Brahmapootra and Megna Rivers from the North-West Provinces to Eastern Bengal and Assam. It is common in Sylhet, Cachar, Noakhali and Tippera. It occurs, but is not common, in Chittagong and does not extend into Arakan. Osmaston says that it is rare in Gorukpore.

Nidification. The Swamp-Partridge breeds in the United Provinces in April, whilst in Assam we found eggs from the middle of March to the end of May and Coltart took others in Behar in April. The nest is generally in among broken-down reeds, elephant-grass, "nal" etc., either close alongside some swamp or water-course or actually growing in the water. It is a well-built thick pad of rushes and grass, the base often mixed with weeds. The diameter may be anything from eight inches to a foot and the depth approximately four to six inches, with a good deep hollow for the eggs. Occasionally this Partridge breeds in thin thatching-grass beside lakes, ponds or rivers, though such a site is not usual. The nest is very hard to find, owing to its exact resemblance to the surrounding mass of reeds etc., whilst even the eggs are very inconspicuous. These latter number from three to six and are of two types. That found in the United Provinces and over the greater part of the Ganges area is a pale buff or greyish-buff, almost immaculate but, if carefully examined, generally showing a few faint freckles or small blotches of tan-brown. The eggs found in Assam have the same ground-colour but almost invariably have the blotches of light reddish-brown or tan-colour well developed and sometimes numerous and conspicuous. Forty-eight eggs average 39·4 × 30·0 mm.: maxima **42·0** × 29·9 and 36·6 × **31·3** mm.; minima **36·1** × 29·3 and 38·2 × **29·0** mm. The hen-bird is a very close sitter and seems to do all the incubation during the day, while the cock-bird assists during the night or, at least, in the very early morning and late evening, when the hen goes to feed.

Habits. Godwin-Austen obtained the Kyah on the Khasia Hills plateau but with this exception this Partridge is a bird of swamps, lakes and rivers in the plains. The occurrence in the Khasia Hills must have been quite unusual, as during many years' residence in that district I never saw or heard of it. It is most common in Cachar, Sylhet and some of the coastal Sunderband districts, where it keeps almost entirely to the dense ekra- and elephant-grass which covers wide areas on the banks of the big rivers and round about the vast lakes and swamps. It is only when, in the height of the rains, these grounds are deep under water that the Kyah wanders up into the fields of thatching-grass. They feed in the open in the mornings and evenings, both in short grass-land and in cultivated fields but never far from the longer grass and reeds, into which they run on the slightest hint of danger. Their food consists of grain, seeds, shoots of both land- and water-plants, snails, worms, insects, small crabs and shell-fish and they themselves furnish an excellent dish for the table. They are the most pugnacious of all the Francolins, fighting rather like Game-fowl but using their bills more and their spurs less. The Sylheti Mahomedans train these birds for fighting and much money often changes hand over a main. In a wild state they will sometimes fight until one bird is completely exhausted

but not, I think, to death. Their call is a loud ringing "chuck, chuck, chukeroo, chukeroo," not so musical or cheerful as that of the Black Partridges.

Francolinus pondicerianus.

Key to Subspecies.

A. Darker; centre of throat ochraceous .. *F. p. pondicerianus*, p. 419.
B. Paler; centre of throat creamy-white. *F. p. interpositus*, p. 421.
C. Palest; plumage generally more grey and less chestnut ..... *F. p. mecranensis*, p. 422.



Fig. 52.—Head of *F. p. pondicerianus*. ½.

(1983) Francolinus pondicerianus pondicerianus.

THE SOUTHERN GREY PARTRIDGE.

Tetrao pondicerianus Gmelin, Syst. Nat., i, p. 760 (1789) (Pondicherry).
Francolinus pondicerianus. Blanf. & Oates, iv, p. 139.

Vernacular names. *Gowjal Huki* (Can.); *Kondari* (Tam.); *Kawanga* (Tel.); *Oussa watuwa* (Cing.).

Description. Forehead and pale supercilium rufous, the latter paler; crown and nape brown; upper plumage greyish-brown with pale buff, black-edged cross-bars; the back, scapulars and wing-coverts much mixed with chestnut, the inner secondaries with much black on the inner webs and the tips mottled brown and fulvous; upper tail-coverts and rump vermiculated with obsolete dark bars; inner coverts, scapulars and inner secondaries white-shafted; primaries brown with obsolete white spots near the tip of the outer webs developing into bars on the outer secondaries; central tail-feathers like the upper tail-coverts, outer tail-feathers chestnut, grading into broad black subterminal bars and pale dirty-grey tips; sides of the head pale rufous, speckled with black on lores, upper cheeks and behind the eye; point of chin white; rest of chin and throat ochraceous-rufous surrounded with black; remainder of lower parts pale buff, with narrow bars of black, transverse on fore-neck and upper breast

and following contour of feathers on abdomen and posterior flanks, sides of neck more grey and a space of unbarred white all round black gular band; upper breast much suffused with chestnut.

Colours of soft parts. Iris hazel-brown; bill dusky plumbeous, paler and fleshy at base; legs and feet dull red.

Measurements. Wing, ♂ 142 to 161 mm., ♀ 142 to 146 mm.; tail 81 to 91 mm.; tarsus, ♂ 44 to 46 mm., ♀ 41 to 42 mm.; culmen, ♂ 22 to 24 mm., ♀ 21 to 23 mm.

Young birds are like the adult but have less rufous on the forehead and have the black gular line less developed or obsolete and the ochraceous patch paler.

Distribution. Ceylon, South India, North to Poona on the West, the South Deccan in Central India and Madras Presidency on the East to the Godavery River. Introduced into Andamans.

Nidification. The Southern Grey Partridge breeds in Ceylon from December to March and in South India has apparently two seasons, one from February to May and the second in August to October. The nest varies—sometimes indeed there is none, the eggs being laid on the bare ground but generally there is a certain amount of grass lining to the hollow selected, while at other times there is quite a good nest of grass and weeds. Most nests are placed in grass-land, thin scrub-jungle or in ploughed fields and standing crops, less often they may be found in denser bush-jungle. Hume also records certain nests as being built three feet from the ground in tangled bushes. The eggs number four to eight, occasionally nine. In colour the eggs vary from a cream, so pale as to appear white, to a fairly warm pale café-au-lait or buff. There are, of course, no markings. The texture is fine, smooth and clear with a considerable gloss and the shape varies from peg-top to oval. Eighty eggs average 34·5 × 26·1 mm.: maxima **37·2** × 23·0 and 35·2 × **27·8** mm.; minima **31·6** × 24·0 and 32·6 × **22·8** mm.

The birds probably pair for life.

Habits. The Grey Partridge, whatever the race, is a bird of neither the wettest parts nor of the driest areas except when the latter are immediately surrounding swamps or lakes or bordering large rivers. It prefers patches of grass and jungle in between cultivated areas and may be seen in the close vicinity of villages, where it will be found in coveys containing one or two pairs of birds and their last broods, the young ones remaining with their parents until these again desire to breed. Although monogamous the cock-birds are very pugnacious and are kept by Mahomedans for fighting purposes. They become extraordinarily tame and will follow their masters when taken for a walk and when directed will also return to them and re-enter their cages. Their call is a fine game sound and consists of three single, rather harsh notes followed by trisyllabic cries rapidly repeated which are very resonant and high-pitched. The cock is habitually used as a

decoy and, placed in a cage on the ground, by its challenges, soon answered by every bird within hearing, enables the trapper to arrange nets or other traps with success, or else it actually decoys its fellow Partridges into the trap already set. Although confirmed runners, once flushed they fly well and strongly and afford excellent sport, big bags being often made during the non-breeding months. They feed on insects, seeds, grain and shoots of plants and are themselves, though rather dry, good birds for the table.

(1984) Francolinus pondicerianus interpositus.

THE NORTHERN GREY PARTRIDGE.

Francolinus pondicerianus interpositus Hartert, Nov. Zool., xxiv, p. 288 (1917) (Oudh).

Francolinus pondicerianus. Blanf. & Oates, iv, p. 139 (part.).

Vernacular names. *Titar, Ram Titar, Gora-titar, Safed Titar* (Hin.); *Jirufti* (Punjab); *Khyr* (Beng.); *Tauzarai* (Pushtu).

Description. Differs from the preceding bird in being much paler everywhere and in being more grey and less brown; the bars on the upper plumage are very pale fulvous, almost white on the scapulars and inner secondaries; the throat-patch is creamy-white rather than ochraceous; the lower parts are paler and the breast less suffused with rufous.

Colours of soft parts as in the other races.

Measurements. Wing, ♂ 142 to 153 mm., ♀ 132 to 145 mm.; culmen 20 to 22 mm.

Distribution. Whole of Northern India, North of the preceding race from Sind, the Southern Plains portion only, East to Behar and Western Bengal throughout the drier hilly country of Chota Nagpore to Midnapur and Rajmehal. The birds of Southern Sind are often intermediate between *mecranensis*, *interpositus* and true *pondicerianus*, perhaps on the whole nearest *interpositus*. In the hills, however, as well as throughout the whole of Northern Sind, West of the Indus, the birds must be accepted as *mekranensis*, for they are far too pale a grey to be considered the present race.

Nidification. The Northern Grey Partridge has two breeding-seasons, the first principally during March and April and the second during August and September. At the same time they are very irregular breeders and eggs have been taken in almost every month of the year. Nest and eggs are similar to those of the preceding race but a very favourite nesting-site is at the bottom of hedges, or isolated clumps, of cactus. Like the other subspecies they are very close sitters and may easily be caught on the nest. Ninety eggs average 32·4 × 25·6 mm.: maxima 35·8 × 26·2 and 35·6 × 27·4 mm.: minima 30·2 × 24·8 and 30·4 × 23·0 mm.

Habits. Those of the genus.

(1985) Francolinus pondicerianus mecranensis.

THE MECRAN GREY PARTRIDGE.

Francolinus mecranensis Zarudny & Harms., Orn. Monatsb., p. 53 (1913) (Baluchistan).
Francolinus pondicerianus. Blanf. & Oates, iv, p. 139 (part.).

Vernacular names. *Acho Titur* (Sind); *Tauzarai* (Pushtu); *Gora Titur* (Hind.).

Description. Much paler than either of the preceding races; above the general tone of the plumage is grey, not brownish-grey and the chestnut, practically confined to the scapulars and wings, is much paler and also less in extent; the throat-patch is white or almost so and the surrounding white spaces broader and whiter; the breast is but faintly tinged with ochraceous.

Colours of soft parts. Similar to, but paler than, the same parts in the other races.

Measurements. Wing, ♂ 141 to 149 mm., ♀ 137 to 139 mm.; culmen 19 to 23 mm.

Distribution. The Mekran Coast, Sind, throughout the hilly portion and also between the Indus and Baluchistan in the North; Baluchistan, Afghanistan, South and Central Persia. In the North-West Frontier Provinces West of the Indus only this race seems to occur. Whitehead's birds from the Frontier, Rattray's from Dera-Ismail-Khan and Bunnu, and others from Quetta, all seem nearest this pale grey race.

Nidification. In Northern Sind, between Sukkar and Baluchistan this Partridge breeds in great numbers during March and April and in Baluchistan and Afghanistan most breed during April and May, whilst in Persia it breeds from April to June at altitudes up to 9,000 feet. So far as is yet recorded it does not seem to have a second breeding-season later in the year. Nests and eggs are like those of the other races. Seventy-seven eggs average 34·0 × 26·0 mm.: maxima **37·3** × 25·6 and 35·1 × **27·4** mm.; minima **31·0** × **24·4** mm.

Habits. This race only differs from the others in inhabiting drier, more arid and desert country. Even in these, however, it keeps much to the water-courses where there is scrub and other jungle or a certain amount of grass and cultivation and it is seldom to be found in the actual deserts or stony wastes in which there is no cover.

Genus **PERDIX**.

Perdix Brisson, Orn., i p. 219 (1760).

Type, *Tetrao perdix* Linn.

This genus, of which the Common European Partridge is the type, is represented in India by one species which just enters our limits from Tibet.

In *Perdix* the wing is rounded; the first primary between the seventh and eighth in length, the fourth rather the longest; the tail of sixteen feathers in our Indian birds eighteen in some of the others, is equal to rather more than half the wing in length and is very slightly graduated; the tarsus is strong but has no spur. The genus extends throughout the Palæarctic region.

Key to Subspecies.

A. Nuchal collar broad and dark chestnut in colour.
  a. Black of cheek extended as collar below throat ..... *P. h. hodgsoniæ*, p. 423.
  b. Black of cheeks not extended to throat .. *P. h. sifanica*, p. 425.
B. Nuchal collar narrow and of paler chestnut-yellow ..... *P. h. caraganæ*, p. 425

(1986) Perdix hodgsoniæ hodgsoniæ.

THE TIBETAN PARTRIDGE.

Sacfa hodgsoniæ Hodgs., J. A. S. B., xxv, p. 165 (1857) (Tibet).
Perdix hodgsoniæ. Blanf. & Oates, iv, p. 142 (part.).

Vernacular names. *Sakpha* (E. Tibet); *Rakpa* (Central Tibet); *Chetra* (Konglo).

Description. Line round the base of the bill black, followed by a white line extending back over the eye as a supercilium; a second black line is followed by the rich chestnut forehead and sides of the crown, the centre of the latter browner and mottled with black and white; nape and hind-neck greyish-brown mottled with white and, to a less extent, with black; a broad chestnut collar at base of hind-neck; back, rump and upper tail-coverts blue-grey, barred and stippled with black and a little rufous; central tail-feathers the same but more boldly barred with black; lateral tail-feathers chestnut, narrowly edged with black stippled with fulvous; wing-coverts and inner secondaries with bold central streaks of pale fulvous bordered with black, a few bold bars of deep chestnut and pale fulvous and the rest with fine stippled lines of black, grey and fulvous; quills brown, barred with light chestnut and whitish; ear-coverts blackish-chestnut with white bases; hind-cheeks black; fore-cheeks, lores, chin and throat fulvous-white with a black border joining the black cheeks; fore-neck white or creamy-white, with a narrow chestnut band meeting the chestnut hind collar; below white, the centre of the breast with broad black bars, which sometimes coalesce to form a completely black patch on the abdomen; sides of breast and flanks marked with chestnut patches and with bold blackish-chestnut bars; vent and under tail-coverts pale fulvous or fulvous-white, sometimes marked with tiny speckly bars of black.

Colours of soft parts. Iris brown or red-brown; orbital skin deep velvety crimson in the breeding-season, dull reddish-crimson at other times; bill pale horny-green; legs and feet pale greenish-brown or pale livid greenish.

Measurements. Length about 300 mm.; wing 155 to 165 mm.; tail about 86 to 91 mm.; tarsus about 40 to 43 mm.; culmen about 15 to 17 mm. The female has a wing of about 150 to 155 mm.

Young birds have no tinge of blue-grey above; the chestnut is absent everywhere; the lower parts are a dull earthy-buff, the breast with pale striæ and indefinite narrow bars of dull black; the crown, cheeks and ear-coverts are dark brown with white apical spots.

Distribution. Tibet, from the extreme West to the East where it meets *P. h. sifanica*, a smaller and less richly-coloured race. On the West it is replaced by another form in Ladak and in North-East Kashmir. It is not rare in the highest valleys of both Sikkim and Nepal but does not occur anywhere near Darjeeling. It is found in both the Abor and Mishmi Hills.

Nidification. This Partridge breeds all over Tibet between 12,000 and 15,000 feet, occasionally up to 17,000 and down to 11,000 feet. It commences to lay in the middle of May and eggs may be found until the middle of August though the vast majority are laid in June. The site selected varies a good deal. Some nests are made in the bare rocky plateaux where there is no vegetation beyond a few stunted bushes and tufts of coarse grass; others are placed in the small thorny scrub so common on the Tibetan plateaux, whilst a few may be found in standing crops. There is no real nest; just a hollow, natural or scratched out by the birds leeward of a bush or boulder, sometimes devoid of all lining, at others with a mass of wind-blown leaves and rubbish. The eggs number eight to twelve, whilst Prjevalsky speaks of clutches of fifteen and over. The eggs are very like those of the Common Partridge but longer and narrower. The ground-colour varies from a pale reddish-buff, which is rare, to a warm clear olive; the texture is fine and close and faintly glossy. One hundred and fifty eggs average 37·6×27·2 mm.: maxima **43·0**×26·3 and 39·2×**28·4** mm.; minima **34·7**×27·1 and 38·1×**24·9** mm. The hen-bird is said to be a very close sitter and the cock-bird to assist in looking after the young.

Habits. Hume found this Partridge on the most bare and desolate plateaux with only a few odd patches of mossy herbage but Bailey says they prefer places where there are growing crops, grass and bushes and that in these places good sport may be had, he himself bagging 48 and 43 on two days. They consort in coveys of ten or a dozen, rise well and get away quickly and when they re-alight often scatter considerably. Bailey says that

they call one another "with a curious buzzing sound exactly imitated by the creaking lid of a lunch-basket." They feed on all kinds of seeds, berries, insects etc. and their flesh tastes much the same as that of the English Partridge.

(1987) Perdix hodgsoniæ sifanica.

THE KANSU PARTRIDGE.

Perdix sifanica Prjevalsky, Mongol. Shan. Tang., ii, p. 124 (1876) (Kansu).

Vernacular names. *Sakpa* (E. Tibet).

Description. Similar to *P. h. hodgsoniæ* but much less richly coloured; the blue-grey tint on the upper parts is either absent altogether or is confined to the upper back or interscapulars; the lower parts also are duller and there is less chestnut on the flanks and the sides of the breast; the black on the cheeks is also less in extent than in *P. h. hodgsoniæ* and never meets below the throat.

Colours of soft parts as in the preceding race.

Measurements. Wing 140 to 153 mm.

Distribution. North-East Tibet, Nanschan, Koko Nor to Setchuan; Bailey found it in suitable places from Setang to Dokeng on the Upper Irrawaddy Valley.

Nidification. Prjevalsky found young birds in August but in May the hens had only commenced to lay. Some clutches of eggs taken between Chiamdo and Batang in extreme East of Tibet were found some time in early July and are exactly like those of the Tibetan Partridge. The clutches contained five to eight eggs.

Habits. Prjevalsky found this Partridge between 12,000 to 17,000 feet and records it also on the plateaux at about 10,000 feet elevation; Bailey obtained it between 12,500 and 15,000 feet. It seems to haunt rhododendron-thickets as well as the open plateaux and grass-plains.

(1988) Perdix hodgsoniæ caraganæ *.

THE LADAK PARTRIDGE.

Perdix hodgsoniæ caraganæ Meinertz., Bull. B.O.C., xlvi, p. 86 (1826) (Shushal).

Perdix hodgsoniæ. Blanf. & Oates, iv, p. 142 (part.).

Vernacular names. *Chak pa* (Ladaki).

Description. Much paler than the Tibetan Partridge; less bluish tinge above and more chestnut markings; the broad rich chestnut collar in that bird is replaced by a narrow yellow-chestnut collar.

* The differences in this race were pointed out by me in the Bombay Natural History Society's Journal, xxviii, p. 574 (1922).

Colours of soft parts and **Measurements** as in the Tibetan race.

Distribution. Ladak, where Osmaston records it as generally a rare bird and common in a few places only at about 15,000 feet. It was once obtained in the Bhagiratti Valley near Gangotri and it also occurs in Kuman at the highest elevations.

Nidification. Nothing recorded.

Habits. Osmaston says that it was often found frequenting Caragana-bushes, otherwise there is nothing recorded beyond Meinertzhagen's notes:—"This Partridge was only found in Tibetan gorse (Caragana), which grows in patches along the Pangkong Lake and in most of the valleys of Eastern Ladak. They are difficult to flush but, if driven to the end of the patch in which they live, will sit close. When they rise they make very much the same noise as the English Partridge."

Genus **TETRAOGALLUS**.

Tetraogallus Gray, Ill. Ind. Zool., ii, pl. 46 (1833).

Type, *Tetraogallus himalayensis* Gray.

This genus contains the birds known as Snow-Cocks, all of considerable size. The wing is rounded, the first primary about equal to the sixth, the second longest; the tail is equal to about two-thirds the length of the wing and is well graduated; the tarsus is short, feathered at the base and armed with a spur; a naked space behind the eye.

Sexes alike or only differing slightly.

The genus is confined to the mountains of Central Asia from Asia Minor to Western China.

Key to Species.

A. Lower breast and abdomen dark grey .... *T. himalayensis*, p. 426.
B. Lower breast and abdomen white with black streaks ..... *T. tibetanus*, p. 429.

(1989) **Tetraogallus himalayensis himalayensis.**

THE HIMALAYAN SNOW-COCK.

Tetraogallus himalayensis Gray, P. Z. S., 1842, p. 105 (Himalaya); Blanf. & Oates, iv, p. 143.

Vernacular names. *Kulla*, *Lupu*, *Baera* (W. Nepal); *Huinwa* (Kuman); *Jer-Monal* (Hills N. of Mussoorie); *Leep* (Kulu); *Galaond* (Chamba); *Kabuk*, *Gourkagu* (Kashmir); *Kabk-i-dara* (Persian, Afghanistan); *Utar*, *Ular* (Turkestan).

Description. Forehead and short supercilia buffy-white; ill-defined and merging into the grey of the head and nape; a line from behind the eye deep chestnut expanding into a broad patch on the sides of the neck, forming a complete collar below the fore-neck and a broken collar on the hind-neck; a

second line of deep chestnut runs from the angle of the bill or rather further back from below the cheek, meeting the chestnut collar on the neck; upper back buffy-grey vermiculated with darker grey and with dark shafts; back and interscapulars vermiculated with blackish-grey and buffy-white; remainder of upper plumage and wing-coverts the same, with bold streaks of buff on both webs of each feather, becoming more rufous on the scapulars and wing-coverts; longest tail-coverts unmarked with buff; central tail-feathers like the coverts, outer tail-feathers more chestnut and with broad black subterminal patches on the inner webs; primaries ashy-brown, dark-tipped and with the bases largely white on both webs; outer secondaries with but little white at the base and the grey vermiculated with buff, this colour increasing in depth and extent until the innermost secondaries have broad pale chestnut edges and the rich chestnut-buff vermiculations as extensive as those of blackish-grey; sides of head and neck, chin, throat, fore-neck and breast white, the head more or less suffused with grey and the breast next the chestnut necklace blotched with black; lower breast and upper abdomen vermiculated dark grey and buffy-white; flanks and lower abdomen grey, with obsolete vermiculations and broad marginal streaks of blackish replaced by chestnut on the posterior flanks; vent and thigh-coverts dark grey and buff; under tail-coverts white; lesser and median under wing-coverts dark grey; greater coverts pale grey; axillaries vermiculated grey-buff with black and rufous margins.

The plumage varies considerably in tone, some birds being more buff and less grey above and much more buff below with the marginal streaks more chestnut and less black; the amount of black spotting below seems to decrease with age and many birds retain the grey on the sides of the head, chin, throat etc. for some years, possibly always.

Colours of soft parts. Iris dark hazel-brown; edges of the eyelids slaty-blue; orbital skin pale yellow; bill pale horny-brown or horny-slate, the membrane over the nostril and the cere bright yellow-orange; legs and feet orange to bright red; claws black.

Measurements. Wing 280 to 312 mm.; tail 173 to 193 mm; tarsus 62 to 64 mm.; culmen 28 to 33 mm. Weight, ♂ 4 lb. to 6½ lb., ♀ 3 lb. to a little over 4 lb.

Young birds are like the adult but paler and duller, the white is everywhere replaced by dull grey; the feathers of the crown are mottled grey with dark margins; the lower back is more definitely barred with blackish and buff; the lower plumage is duller and many of the feathers are margined with buff at the tips; the chestnut collar and bands are wanting in very young birds and but ill-defined in half-grown birds.

Chick in down. Mottled above with brownish-black and fulvous, the crown darker with the black more defined down the centre;

a well-defined blackish-brown eye-streak; a second dark line from the base of the bill dividing into two below the ear-coverts; below dull greyish-white.

Distribution. Western Himalayas from Manschan, the Pamírs, Eastern Afghanistan to Kashmír, Ladak and Garhwal.

Nidification. The Himalayan Snow-Cock breeds throughout its range between 12,000 and 15,000 feet; occasionally it is said as high as 17,000 feet during the months of July and August.

No nest is made, the birds merely scratching a hollow in the ground under shelter of a rock, boulder or tuft of scrubby grass, the favourite site being close to the crest of a ridge on the leeward side. Generally bare stony hill-sides are selected with little or no vegetation beyond withered tufts of grass or sparse stunted bushes of thorns. The hen sits very close and the cock-bird keeps constantly on the watch close to her, warning her of the approach of danger with a loud whistle. The eggs seem usually to number four to six, occasionally seven but the hill-men assert that they sometimes lay as many as a dozen. The ground-colour varies from a very pale yellowish stone-colour to a rather rich reddish-buff and in a few eggs there is a faint tinge of grey or green. The markings, scattered fairly profusely over the whole surface of the egg, consist of freckles and small blotches of reddish-brown; in some eggs the freckles are absent and the blotches rather more numerous. The shape is a long oval, the texture coarse-grained and strong but the surface fairly glossy. Sixty-eight eggs average 65·4×45·4 mm.: maxima **72·8**×47·0 and 68·0×**48·2** mm.; minima **62·0**×**43·1** mm.

Habits. This fine Game-bird is found in Summer beyond the limits of tree-forest up to about 16,000 feet and less often up to 18,000 feet, whilst in the Winter it ascends to 10,000 feet, Osmaston recording it as low as 8,000 feet, where, however, it never enters forest. It keeps entirely to open country and seems to prefer hill-sides where even the vegetation which forms its main food-supply is but scanty. Osmaston found that it fed to a great extent on a small grass-like herb (*Gagea lutea*) growing about deserted habitations and old camping-grounds; they also eat all kinds of berries, seeds and a great quantity of insects, small grasshoppers etc. They are very wary birds in places when they have been at all disturbed, a sentry always being on duty when they feed; in places, however, where they are strange to men they are very tame. When disturbed they run uphill and then launch themselves from the crests in flight, getting up considerable speed and affording good sporting shots. They are very gregarious and soon after the chicks have hatched, collect in flocks, sometimes very large. Their call-note is said by Wilson to be "a low, soft whistle. . . . the first note considerably prolonged and followed by a succession of low rapid whistles, the most agreeable song of all our Game-birds." Their flesh is excellent for the table.

Tetraogallus tibetanus.

A. Paler and more sandy on the head, nape and back ..... *T. t. tibetanus*, p. 429.
B. Darker and more fulvous on the head, nape and back ..... *T. t. centralis*, p. 450.
C. Darker, less sandy or fulvous on the head, nape and back ..... *T. t. aquilonifer*, p. 432.

Tetraogallus tibetanus has been divided into five races by Suschkin, two being newly created by him, whilst Meinertzhagen has added a sixth, which seems just recognizable by its slightly darker tint. It is possible that more ample material for comparison may prove some of the races to be founded on merely individual variation. Pending such material being available, I retain the three races which find a place within our area.

(1390) Tetraogallus tibetanus tibetanus.

THE TIBETAN SNOW-COCK.

Tetraogallus tibetanus Gould, P.Z.S., 1853, p. 47 (Tibet, Ladak); Blanf. & Oates, iv, p. 144 (part.).

Vernacular names. *Utar Utar* (Turki); *Hailik* (Mongols); *Gämmo* (Tanguts).

Description.—Adult male. Lores and edge of forehead buffish-grey; chin, throat and posterior ear-coverts white; crown, nape, hind-neck and extreme upper back dark grey, very finely powdered with buffy-white; back, rump and lesser wing-coverts like the upper back but with bolder pale vermiculations; a lunar band across the back and shoulders paler; rump and lower back with pale buffish margins to each feather; upper tail-coverts and central tail-feathers rufous with narrow wavy bands of blackish-grey; outer tail-coverts chestnut- or brownish-black with chestnut tips; scapulars, wing-coverts and innermost secondaries like the back but with broad white or fulvous-white margins to each feather; primaries brown with pale tips, increasing in size inwardly; outer secondaries broadly tipped and edged with white, forming a conspicuous white wing-patch; breast white, divided from the rest of the lower plumage by a band of grey feathers, edged blackish and obsoletely vermiculated with white; remainder of lower plumage white, the feathers with black edges forming streaks, broadest on the flanks and posterior abdomen; vent and thigh-coverts vermiculated grey and buff with white tips.

Colours of soft parts. Iris brown to red-brown; bill horny-purple, the base and membrane over the nostril orange-red; orbital skin and eyelid slaty-blue; legs and feet dull orange-red to deep red.

Measurements. Total length about 500 mm.; wing 255 to

276 mm.; tail 130 to 132 mm.; tarsus 62 to 65 mm.; culmen 28 to 32 mm.

Female. Similar to the male but with the grey pectoral band much vermiculated with pale fulvous; the breast and neck are generally mottled more or less with brown fulvous barred feathers as in the young bird but this mottling nearly disappears in old birds.

Young bird. The white supercilium more conspicuous than in the adult; the sides of the head and neck are boldly barred with buff; the feathers of the back have pale mesial lines and there is no dorsal band; the feathers of the wing are mottled black and buff with white drops at the tips; chin and throat white; breast grey, vermiculated with whitish and mottled with dark brown and buff; abdomen and flanks white with no streaks.

Distribution. Pamirs, Yarkand, Kashgar to Ladak and North-West Tibet.

Nidification. The Tibetan Snow-Cock breeds in Ladak and North-West Tibet in June and early July, a few birds laying in the end of May, as Osmaston took seven eggs near Leh on the 27th May at 14,800 feet. Their breeding-season must last some time, as in August Prjevalski found some young no bigger than Quails, whilst others were as big as their parents. The nest is just like that of the next bird, a mere scratching under shelter of a rock on the leeward side of a hill. The eggs number four to seven, so far as is known at present, and only differ from those of the next bird in being somewhat larger. Sixteen eggs average 63·8 × 44·1 mm.: maxima **68·6** × 44·0 and 66·4 × **46·9** mm.; minima **58·4** × 42·4 and 60·5 × **41·1** mm.

This Snow-Cock breeds up to 17,000 feet on the very edge of the snow-line or even beyond it in partly-protected spots on the Southern slopes.

Habits. The Ladak Snow-Cock is found in Summer up to 19,000 feet, whilst in Winter they keep mostly between 10,000 and 14,000 feet. It is never found in forest but keeps to grass-covered plateaux and ridges or to the more barren and stony plains where there is but little vegetation. Their habits do not differ from those of the next bird.

(1991) Tetraogallus tibetanus centralis.

THE CENTRAL TIBETAN SNOW-COCK.

Tetraogallus tibetanus centralis Sushkin, Bull. B. O. C., lxvii, pp. 37, 182 (1926) (Tangla Range, Central Tibet).
Tetraogallus tibetanus. Blanf. & Oates, iv, p. 144 (part.).

Vernacular names. *Hailik* (Mongols); *Ganmo* (Tanguts); *Lapcha Kongmo* or *Kongmo* (S. Tibet); *Pi-mo-chi* (S. Chinese).

Description. Differs from the typical form in being much

darker above and below and in being much more fulvous-olivaceous in its general tint.

Colours of soft parts as in the other races.

Measurements. Wing 260 to 268 mm.; wing, ♂ 270 to 280 mm., ♀ 260 to 270 mm. (*Sushkin*).

Distribution. South Tibet, Mishmi and Abor Hills. North it extends to the Tengla Range, North of which again its place is taken by Sushkin's *tschemonensis* and by *przewalskii* on the North-East.

Nidification. This Snow-Cock breeds in great numbers in Southern Tibet at all elevations between 12,000 and 17,500 feet or even higher. It is especially numerous on the Gyanase plateau, where many nests have been found by Steen, Kennedy, Macgregor and others between 12,500 and 14,000 feet. It is said to select the bleakest and barest of hill-sides and plateaux for nesting purposes, avoiding the grass-covered or bush-covered portions. The nest is like that of all Snow-Cocks, just a hollow under a rock or scanty patch of grass and always on the leeward side of the hill.

They commence breeding in the last week in May and continue up to the middle of July but eggs have been taken up to the 25th August, probably a second laying. One hundred and forty eggs average 62·6 × 43·2 mm.: maxima **68·0** × 44·0 and 66·1 × **45·0** mm.; minima **57·7** × 40·6 and 60·2 × **40·3** mm. They are quite indistinguishable from those of the Himalayan Snow-Cock except by size.

Habits. Those of the genus. This species, however, appears to be entirely vegetarian in its diet, no insect-remains having been found in their stomachs. They are said to be very easy to rear and keep in captivity and the Tibetans often keep them.

In Summer it may be found anywhere between 12,000 feet and the snow-line, often crossing even this and actually scratching about in the snow itself for food. In Winter it comes lower down and wherever the grass-covered plains and ridges descend between the forests these birds also are to be found; they never, however, enter forest or even heavy scrub. They collect in flocks of some size, two or three broods joining forces, feeding and moving about together. They are naturally tame bold birds and it takes a good deal of shooting and hunting to make them really wild. When feeding they post no sentries but during the mid-day siesta one or more of the old birds mount high boulders and keep a sharp watch, warning the flocks on the approach of danger with loud prolonged whistles. After feeding on crops and plentiful food they are said to be fat and tender and quite good for the table, though some sportsman say they are dry and insipid. They are strong on the wing and fly at an immense pace downhill but they are averse to flying if they can escape by running and will not under any circumstances fly uphill.

(4992) Tetraogallus tibetanus aquilonifer.

THE SIKKIM SNOW-COCK.

Tetraogallus tibetanus aquilonifer Meinertz., Bull. B. O. C., xlvi, p. 99 (1926) (Interior of Sikkim).

Vernacular names. None recorded.

Description. Differs from the two preceding races in being darker and less sandy or fulvous on the head, nape and back. It is apparently extremely close to *T. t. przewalskii*, differing only in having the buff collar on the upper back more developed. In *T. t. przewalskii* this collar is less pronounced and is "strongly powdered with dark grey."

Colours of soft parts and **Measurements** the same as in the other races.

Distribution. "Alpine Sikkim and South Tibet" (*Meinertzhagen*). "South Tibet" possibly means only that portion of Tibet immediately adjoining Sikkim. Birds from the Gyantse plateau in South Tibet, from Phari, Yatung on the West of that plateau and from the Abor Hills are *centralis*.

Nidification. Unknown.

Habits. Meinertzhagen met with this Snow-Cock on the "Tibetan plateau country in Northern Sikkim at Gyagong (15,500–16,700 feet) and near Thangu (15,700 feet) in November." Stevens never came across it but St. John Hickley shot specimens at 15,000 feet in June and in a letter to me says that they were evidently breeding, though he failed to find the nest. He adds that they were very good eating.

Genus LERWA.

Lerwa Hodgs., Mad. Journ. L. & Sci., v, p. 300 (1837).

Type, *Perdix lerwa* Hodgs.

This genus contains a single species of Snow-Partridge differing perhaps very slightly in size but otherwise constant throughout its range. The wing is short but pointed, the second primary longest, the first and third subequal and very little shorter; in some specimens the first primary is the longest and in others the first three are almost or quite equal; the secondaries are comparatively long, reaching to within about an inch of the wing; the tarsi are short and feathered over half their length in front; the tail consists of fourteen feathers and is slightly rounded at the end.

The sexes are alike in plumage but the male possesses a spur on the tarsus, generally short and blunt, occasionally well-developed and sharp, whilst, in rare instances, there is an incipient second spur.

(1993) Lerwa lerwa.

THE SNOW-PARTRIDGE.

Perdix lerwa Hodgs., P. Z. S., 1833, p. 107 (Nepal).
Lerwa nivicola. Blanf. & Oates, iv, p. 145.

Vernacular names. *Lerwa* (Bhut.); *Janguria* (Kuman); *Kar Monal* (Garhwal); *Golabi Bhair, Tur Titur* (Basahr etc.); *Barf-ka-titur* (Kulu); *Bija* (Chamba).

Description. Whole head, neck and upper plumage barred black and buffy-white, the latter suffused with rufous-chestnut to a varying extent, more especially on the scapulars and innermost secondaries; primaries brown, tipped and speckled with dull white on the margins of the outer webs, the outermost primaries sometimes immaculate, probably in old birds; secondaries brown mottled and barred on both webs with white and broadly tipped with purer white on all but the innermost; tail barred with blackish-brown and mottled bars of white; below



Fig. 53.—Head of *L. l. lerwa.* ½.

from the neck deep chestnut, the bases of the feathers marked with black and white; on the breast the white hardly shows but on the flanks and lower abdomen there are broad white streaks tinged with buff; on the inner flanks the white extends to the whole of the outer webs; vent and under tail-coverts barred black, white and chestnut; under tail-coverts chestnut with black shaft-stripes and broad white or creamy-white tips.

Colours of soft parts. Iris brown-red to blood-red; bill bright coral-red; legs and feet orange-red to deep red, deepest and brightest in the breeding-season.

Measurements. Total length about 375 to 400 mm.; wing 180 to 205 mm.; tail 118 to 138 mm.; tarsus 38 to 40 mm.; culmen 18 to 20 mm. This sexes do not appear to differ in size. "Weight 16 oz. to fully 22 oz. I have one bird noted as 25 oz." (*Hume*).

Meinertzhagen * separates the Szechuan birds under the name

* Meinertzhagen, Bull. B. O. C., xlvii, p. 101 (1927).

of *Lerwa lerwa major* on the grounds of their larger size. The wing of 9 Szechuan birds he gives as 190 to 203 mm. and of 41 Sikkim and Nepal birds as 179 to 194 mm., twice 197 and once 200 mm. Under the circumstances the division into races seems unnecessary and I retain all birds under the one name.

Full-grown but young birds seem to have the feathers of the breast centred and sometimes edged with black.

Young in first plumage are mottled above with dull brown and buffy-white, the shafts of the feathers white, showing conspicuously on the scapulars and innermost secondaries; below the whole plumage is mottled pale brown and buffy-white, with white central streaks on breast and flanks.

Chick in down. Centre of crown and nape, round the eye and posterior cheeks velvety-black; remainder of head, throat and sides of neck soft silvery-white; upper plumage chestnut-brown, a blackish mark down the centre of the back and on the thighs; below pale buff to chestnut-buff.

Distribution. The Himalayas from Afghanistan and Baluchistan East through Sikkim and Tibet to Moupin and Ta-tsien-lu in Western China. This Snow-Partridge seems to be confined to a comparatively narrow strip of country running for an immense distance East and West along the first two or three outer snow-ranges of the Himalayas. It is, however, possible that in Eastern Tibet its area of habitat may broaden out very considerably, for Col. F. M. Bailey has met with, and still more often heard of, what he believes to be this bird over a very widely scattered area. It does not occur on the cultivated and broad open plains of Central Tibet, though so common in Sikkim and the adjacent Southern Ranges.

Nidification. The Snow-Partridge breeds thoughout its range between 10,000 and 15,000 feet, but seldom below 12,000 feet. Whymper took many nests in Garhwal nearly all at about 14,000 feet or over; Whitehead took three eggs between 12,500 and 14,000 feet in the Khagan Valley, and in Tibet and Sikkim they certainly breed up to 15,000 feet and perhaps 17,000 feet. The lowest elevations at which they have been taken are on Mongtba, about 10,000 feet, by Rattray and on Parachinar by Buchanan at 11,000 feet. For breeding and nesting purposes the birds keep as a rule to precipitous hill-sides, selecting a hollow under some sheltering rock, either scratched out by themselves or already available. Rarely the eggs are placed on the bare ground, more often quite a neat compact nest of grass and moss is constructed and this again is frequently screened from view by grass or bushes. The hen-bird sits so close and the nests are so well hidden that they are difficult to find, though the cock-bird by his fussiness and agitation gives it away to those who understand his actions. The eggs number

three to five, perhaps occasionally six or seven and in appearance are like poorly-marked speckly eggs of the Koklas. The ground-colour varies from a creamy to a warm rather dull buff and the markings consist of specks and freckles of light reddish scattered fairly thickly over the whole surface of the egg. In a few eggs the specks become small blotches and a few eggs, if carefully examined, also show secondary markings of grey and lavender. Fifty eggs average 54·6 × 35·0 mm.: maxima 57·2 × 35·5 and 54·7 × 37·0 mm.; minima 48·6 × 31·6 mm.

The breeding-season seems to be a long one. Whitehead obtained well-grown chicks and fresh eggs on the 2nd and 3rd July respectively whilst Whymper took the latter from April to the end of June.

Habits. The Snow-Partridge is found above the forest-line and up to the snow-line on steep and rocky ground where there is a certain amount of moss, bush, grass and other vegetation, between 12,000 and 17,000 feet, above which height it was seen during the Everest Expedition. In Summer it has been recorded as low as 7,000 feet, an exceptionally low elevation. Their calls are loud harsh whistles, varying somewhat in tone and loudness but all much alike, whether expressing fear and anger or merely a call to one another when separated. The call to the young is a softer lower note, replied to by the young with a cheep like that of a barn-door chicken. They collect in coveys of half a dozen to thirty or so and when first disturbed rise in a bunch but often scatter on re-alighting and give several single and double shots. As they generally frequent very difficult and precipitous country, shooting them is a sport not to be despised by anyone, more especially as the Snow-Partridge is reputed to be the finest of Indian Game-birds for the table.

They feed principally on seeds, moss, young shoots of various plants and berries but doubtless also on insects to some extent.

Suborder PERISTEROPODES.

In this Suborder systematists generally include two families, the first the *Megapodiidæ* or Megapodes, and the second the *Cracidæ* or South American Curassows, which have a tufted oil-gland like the *Gallinæ*. As only the Megapodes are represented in India we need not discuss their relationship to one another.

In the *Peristeropodes* the inner posterior notch on each side of the sternum is less than half its length; the hallux or hind toe is on the same level as the front toes and its tarsal phalanx is equal to that of the third or middle front toe.

The Suborder, excluding the *Cracidæ*, contains several genera which are found from the Nicobar Islands to the Celebes, New Guinea and Australia, one genus, *Megapodius*, only being represented within our area and that by one species only, which occurs in the Nicobars.

Family MEGAPODIIDÆ.

In addition to the characters of the Order the *Megapodiidæ* are distinguished by their nude oil-gland from the *Cracidæ* of South and Central America. The Megapodes are remarkable for the fact that the young are born fully feathered and able to fly and fend for themselves as soon as hatched.

Genus MEGAPODIUS.

Megapodius Quoy & Gaim., Voy. 'Uranie,' p. 125 (1824).

Type, *Megapodius freycinet*.

In this genus the bill is moderate; the nostrils large, oval and longitudinally elongate; legs and feet very large and powerful, the front of the tarsus broadly scutellated; the claws long and straight, the hind-claw longest; wings short and rounded, the fifth primary longest and the first subequal to the tenth; tail of twelve feathers, short and rounded. Sexes alike.

Numerous species and subspecies are known extending from the Nicobars to Australia and New Guinea. One species only is represented in India.

Megapodius nicobariensis.

Key to Subspecies.

A. Paler in colour and larger ..... *M. n. nicobariensis*, p. 437.
B. Darker in colour and smaller..... *M. n. abbotti*, p. 439.

(1994) Megapodius nicobariensis nicobariensis.

THE NICOBAR MEGAPODE.

Megapodius nicobariensis Blyth, J. A. S. B., xv, p. 52 (1840); Blanf. & Oates, iv, p. 147.

Vernacular names. *Kongah* (Nicobars).

Description. The feathers of the nape, sides of the head and surrounding the posterior portion of the crown greyish; chin and throat sparsely feathered with pale grey, sometimes more rufescent, sometimes more albescent; remainder of plumage rufescent-brown, generally darker above than below, where it is often a rufous-grey, more rarely almost a pure grey.

The general tone of the upper plumage varies from a rather bright rufescent to a dull rufescent occasionally somewhat olive in tint.



Fig. 54.—Head of *M. nicobariensis*. ½.

The feathers round the neck are sparse and this part is sometimes almost bare, whilst in many specimens the feathers of the head and crown are scanty or wanting altogether and the skin is more or less covered by a black scab, looking as if the bird was suffering from some skin disease.

Colours of soft parts. Iris light to dark brown; eyelids red, the skin of the lores, sides of head and neck shows through from cherry-red to bright brick-red or, according to Richmond, mauve-pink; bill greenish- or yellowish-horny, paler along the commissure; legs and feet greenish-horny, darker in front and more red or brick-red on the back.

Measurements. Total length 374·5 to 409·5 mm. (*Richmond*); wing 228 to 250 mm.; tail 69 to 88 mm.; tarsus about 59 to 68 mm.; culmen about 23·5 to 26 mm.

Weight of males 21 to 34 oz., females 30 to 36 oz.

Birds not quite adult have the head and neck completely clothed with feathers, those on the chin and fore-neck being greyish-white; the underparts seem to be invariably brown or rufous-brown with no tinge of grey.

Young birds the size of a Quail are "uniform snuff-brown all over, everywhere densely feathered, even about the throat and neck, and with the feathers of the forehead and back of the neck much longer, actually and not merely relatively, than in the adult;

no bare space in front of or round the eye, no tail developed, only a large tuft of fur-like feathers, but the wings large, strong and well-formed, the bill very short. One such bird measured 5·5 inches in length and had a wing of 4 inches" (*Hume*, Str. Feath.).

Distribution. Nicobars, where they have been found on every island except Chowra and Car Nicobar. Butler recorded them from Battye Malve; whilst Hume saw traces of their mounds on Table Island, though no birds or even their mounds have ever been found there since. The birds from the Great Nicobar and Little Nicobar are, however, of the next race.

Nidification. These birds make no nest, in the usually accepted terms for such, but deposit their eggs in huge mounds of sand and vegetable-matter, the latter in decaying and fermenting sufficing with the hot tropical sun to create sufficient heat to incubate the eggs. The mounds are generally built close to the coast and average, according to Davison, as much as five feet high and thirty feet in circumference, those built inland being much smaller, only about three feet high and twelve or fourteen feet round. The basis is of vegetable matter and then a layer of sand—really coral dust and minute shells—is put over this and each succeeding year fresh layers of vegetable refuse and sand are added. In the mound holes are dug out by the birds and eggs deposited therein and left to hatch, the young birds so far as is known working their way out unaided. The eggs, which are enormous for the size of the parent, are laid at intervals of several days and each bird probably lays four or five eggs. The exact number, however, is not known, as, though one pair start a mound, their young ones as they arrive at maturity also use the same, and twenty eggs, more or less fresh, have been taken from a single mound. When first laid the eggs are a beautiful salmon-pink or rose-pink but this colour soon fades to a yellow clay and then becomes duller and browner as incubation advances. Eighty-four eggs average 82·6 × 52·3 mm.: maxima **85·5** × 50·3 and 82·0 × **57·1** mm.; minima **76·4** × 49·9 and 81·6 × **46·2** mm.

The chick as soon as it emerges from the shell and has dried itself either flies or runs to the nearest cover and associates with others of its kind.

Eggs have been taken in April, May and June but it is impossible to say how long the breeding-season lasts.

Habits. The Megapodes frequent the dense forest growing along the shores of the islands a little above high-water mark and during the day never leave it but, at night, they may be seen on the shore, often running along the very edge of the sea. They may be found singly or in pairs but more often in parties of considerable size feeding on land-shells, seeds, vegetable-matter, insects, etc. The flocks consist of birds of all ages and in the bigger flocks together with five or six older birds others will be found some just hatched, some half-grown and some as big as

the old birds, though still wearing their head-feathers. When disturbed, they prefer to escape by running, as they are extremely active on their feet but they can fly well, though at no great speed. The newly-hatched and very young birds are said to run more speedily and to fly faster than the old birds. Their call has been syllabified as "Kuk-a-kuk-kuk" by Davison.

(1995) Megapodius nicobariensis abbotti.

OBERHOLSER'S NICOBAR MEGAPODE.

Megapodius nicobariensis abbotti Oberholser, Proc. Nat. Mus. U.S., lv, p. 400 (1919).
Megapodius nicobariensis. Blanf. & Oates, iv, p. 147.

Vernacular names. *Kongah* (Nicobars).

Description. Differs from the preceding race in being darker on both upper and lower plumage, the primaries especially being darker on the outer webs and contrasting less with the inner webs.

Colours of soft parts as in the typical form.

Measurements. Oberholser gives the measurement of the wings of six specimens as 215 to 230 mm. against 206 to 234 mm. in the Northern Nicobar bird.

Distribution. Great and Little Nicobar Islands in the South of the Nicobar group.

Nidification. Eggs taken by Osmaston on the 11th April are, of course, quite indistinguishable from those of the Common Nicobar Megapode. Four were taken from one mound and four from another. The eight average 83·1 × 50·8 mm.

Habits. Those of the species.

Order VII. HEMIPODII.

The *Hemipodii*, or Bustard-Quails, are an Order of small birds which in general appearance closely resemble true Quails but, so far as our Indian birds are concerned, can always be identified at a glance by the fact that they have only three toes, the hallux, or hind-toe, being absent. According to some naturalists two genera are contained in one family, *Turnicidæ*: *i. e.*, the Three-Toed Bustard-Quails of the genus *Turnix*, and the Plain Wanderers with four toes of the genus *Pedionimus*, which are confined to Australia. Other systematists, however, put this latter genus in a separate family, though, as it is not represented in Asia, this point does not interest us.

The nearest relatives of the Bustard-Quails are to be found amongst the *Gallinæ* or Game-birds, the *Pterocletes* or Sand-Grouse, and the two Families *Ralliidæ* (Rails) and *Charadriidæ* (Plovers).

The principal anatomical difference between the *Gallinæ* and the *Pterocletes* and the present Order lies in the formation of the vertebræ. In the two former Orders the last cervical and anterior dorsals are all anchylosed in fully adult birds, whereas in the Bustard-Quail they are free; in the two former, also, the last dorsal vertebra is united with the lumbar vertebræ to form the sacrum.

In the *Gallinæ* the sternum has two notches and the same with *Pterocletes*, though in the latter the second notch may be much reduced; in the *Hemipodii* there is one deep long notch only on each side of the posterior border, and the episternal process is partially perforated to receive the inner ends of the coracoids.

The palate is schizognathous, as in the *Gallinæ*, but the palatines, pterygoids and basiterygoids are more like those of the Plovers.

The nasals are schizorhinal.

The muscles of the thigh are Galline except that the accessory femoro-caudal is absent. In our genus *Turnix* the deep plantar tendons unite, as in other birds with but three toes, and then the combined tendons again split up to supply the three toes.

In other respects the Bustard-Quails resemble the Game-birds; the young are hatched covered with down and can run and feed themselves as soon as they leave the nest.

The eggs are practically invariably four in number, and are somewhat conical, being laid in the nest in the same manner, point to point, as the Plovers lay their eggs.

The females in this Order are larger than the males, often more richly coloured and are polyandrous, leaving the duties of incubation and rearing of the young to the males.

Family TURNICIDÆ.

Genus TURNIX.

Turnix Bonnat., Tabl. Encyl. Méth., i, pp. lxxxii, 5 (1790).

Type, *Tetrao sylvaticus* Desfon.

Bill like that of the *Gallinæ* but rather small and slender; the wings are pointed with the first quill longest; legs and feet moderate, the latter in some species rather long.

Our Indian species are resident throughout their range, though moving higher up the mountains in the warmer months of the year, whilst they may also move about locally in certain parts of India under stress of climatic influences.

Ogilvie-Grant recognized twenty-one species in the Catalogue of the British Museum and twenty-two species in his 'Game-Birds,' where he adds the species *Turnix whiteheadi* from Luzon. To these twenty-two species Grant further adds two subspecies, and of these twenty-four species and subspecies, five species and one subspecies are, according to him, represented in India.

As regards the subspecies of some of our species, they are a matter of no little difficulty but, as I shall deal in detail with these under the various species with which they are connected, further comment is here unnecessary.

The Family *Turnicidæ* is composed of birds of which the female is the larger, generally the higher coloured and always the dominant partner in all domestic matters, for, beyond laying the eggs, she has nothing to do with the rearing of the young.

Key to Species.

A. Breast barred right across with black and white or quite black ..... *T. suscitator**, p. 441.

B. Breast never barred or black in the centre.

a. Central tail-feathers lengthened, pointed and edged with buff; bill dark, not yellow .. *T. dussumieri*, p. 450.

b. Central tail-feathers not lengthened, pointed or edged with buff; bill yellow ..... *T. maculatus*, p. 453.

Turnix suscitator.

Tetrao suscitator Gmelin, Syst. Nat., i, p. 763 (1789).

Type-locality: Java.

The typical form is differentiated from all our Indian races by its very small size combined with its dark colour.

This species has a range extending from Ceylon, through India, Burma, the Indo-Chinese countries, Malay States and Islands to

* *Pugnax* of Temminck is antedated by *javanica* of Raffinesque (1814) and the latter name by *Tetrao suscitator* (1789) of Gmelin, which has therefore to be employed in preference to either.

Java and it undergoes, as one would expect, great variations in plumage, size, etc., so that a "splitter" could create an almost unlimited number of subspecies. In the following pages I have endeavoured to admit as geographical races only those variations which have a well-defined geographical range in which the individuals agree in certain characteristics by which they can be differentiated from their nearest neighbours. More material, and especially better material than was available when the 'Game-Birds of India' was written, has confirmed the remarks I then made on certain variations and compels their recognition as subspecific in value; in consequence, three forms are now recognized in addition to the four there admitted.

Key to Subspecies.

A. Upper plumage very dark and boldly marked with black and, to a less extent, with rufous.	
a. A well-marked rufous collar on female .	*T. s. leggei*, p. 442.
b. No rufous collar on female.	
a'. General plumage dark, boldly marked with black and less with rufous.	*T. s. plumbipes*, p. 445.
b'. General plumage duller, more uniform and less richly marked with black and rufous	*T. s. interrumpens*, p. 449.
B. Upper plumage very dark and rich, the rufous markings exceptionally strong ..	*T. s. blakistoni*, p. 448.
C. Upper plumage decidedly paler.	
c. General tint of upper plumage pale rufescent	*T. s. taijoor*, p. 447.
d. General tint of upper plumage pale isabelline	*T. s. isabellinus*, p. 448.
e. General tint of upper plumage rufous-grey	*T. s. pallescens*, p. 450.

(1996) Turnix suscitator leggei.

THE CEYLON BUSTARD-QUAIL.

Turnix javanica leggei Stuart-Baker, Bull. B.O.C., xliii, p. 9 (1920) (Ceylon).
Turnix pugnax. Blanf. & Oates, iv, p. 150 (part.).

Vernacular names. *Kadai* (Ceylonese, Tamils); *Waltuwa*, *Pundura-Waltuwa*, *Bola-Waltuwa* (Cinghalese).

Description.—Adult female. Upper plumage dull, rufous-red to dark, rather brownish-grey; the head is usually a trifle darker than the other parts, whilst the rump and tail-coverts may be slightly paler; feathers of the crown in the centre tipped white, often forming a definite coronal streak, the rufous on either side more or less barred and spotted with black; lores, supercilia and sides of the head white with narrow margins or small spots of black; nape, shoulders and upper back finely barred with black,

those parts, specially the nape, being often much spotted with white; a broad, well-marked nuchal collar of rufous, sometimes quite unmarked with other colours, rarely slightly spotted with black and white on the lower neck and upper back; lower back, rump and upper tail-coverts much more boldly barred with black and with white marks, either lines or large spots, on the outer webs of the lower back and rump-feathers and the tips of the upper tail-coverts; scapulars like the back but often a little paler, still more boldly marked with black and white, the latter predominating. Wing-coverts like the back but rather paler, the greater and median boldly spotted with buff and black, the amount varying in individuals and the buff on the outer webs often forming a fairly distinct broad bar across the closed wing; lesser coverts and shoulders of wing less conspicuously barred. Quills brown, not very dark and bordered on the outer webs of the primaries with pale buff; primary-coverts the same but often much freckled or barred with buff; the innermost secondaries are like their greater coverts and those nearest them are tipped pale and barred to a slight extent on the outer webs at their ends;



Fig. 55.—Head of *T. s. leggei*, ♀. ½.

chin, throat and centre of neck and breast deep velvety-black; sides of lower neck and breast buffish-white to buff, broadly barred with black, with a few bars extending across the breast below the black and the barring sometimes continued well down the flanks; remainder of lower parts rufescent-buff or deep rusty-buff, usually darkest on the vent and under tail-coverts; under aspect of the wing and axillaries dark silver-grey.

Colours of soft parts. Iris white, occasionally yellowish; legs and feet slate or leaden-grey; bill dark bluish-slate or plumbeous-grey, the culmen slightly darker, especially at the base, where it is quite a dark brown.

Measurements. Total length about 130 to 140 mm.; wing 81 to 88 mm.; tarsus about 25 mm.; culmen about 13 mm.; tail about 25 mm. Legge gives the total length as about 6·3 to 6·5 in. and the wing as 3·4 to 3·55 in., but none of the specimens in the British Museum have a wing as large as this latter. Legge, however, perhaps includes Indian birds in his measurements and those from Upper India run very large.

Adult male. Like the female but has the chin white instead of black, the breast and fore-neck banded black and buff like the sides instead of pure black. As a rule, the markings are somewhat less bold in character and the general appearance duller.

Colours of soft parts. As in the female but the iris more often straw-yellow.

Dimensions. Wing 76 to 81 mm., and other measurements proportionately smaller than in the female.

Young females only differ from the adult in having chin, throat and upper breast like these parts in the male.

Quite young birds of both sexes have the plumage similar to that of the adult male but the black on the upper parts is more plentiful, though duller; the secondaries are more marked and freckled with buff or rufous and the primaries are also rather more widely margined with the same. The breast is spotted with large drops of black, which are sometimes rather arrow-head in appearance or sometimes become broadened into broken bars but never form complete bars as in the adult. The variations in the colour of the tail follow the same range as that of the old birds.

The nestling when hatched is covered with pale whitish-buff on the lower parts and dark chestnut-buff above. There is a broad white line from the lores through the eye to the nape; a dark coronal streak, almost black; pale buff and black crescentic marks on the back; the wings have a dark and a pale bar; the inside of the thighs are chestnut.

Certain naturalists have claimed that the black throat of the female is merely a seasonal change and is lost after the breeding-season. When a bird has so variable a breeding-season as the Bustard-Quail has, it is very difficult to assert that such is, or is not, the case; but the probabilities are all against it. The hen assumes this black during the process of a moult, possibly taking two years before she fully acquires it; birds may, however, be found in *every* month of the year with the black fully developed.

Distribution. Ceylon.

Nidification. Wait and Phillips between them have taken eggs in every month of the year except August. The nest varies considerably; sometimes it is just a hollow under a tuft of grass or bush with a few wind-blown scraps of grass; at others quite a well-made pad of grass is put together for the eggs to rest on. The hollow may be a natural one or one made by the birds and the site selected almost anywhere in among grass and bushes in gardens, round about villages, between patches of rice and other cultivation or in grass-lands or thin scrub. Tea-gardens and rubber-plantations seem to be exceptionally favoured localities. The normal full clutch of eggs is four but Wait says that three are not uncommon, whilst, exceptionally, two only may be incubated. Except in size the eggs do not differ from those of the other races and a description of those of this subspecies will suffice for all. The ground-colour is generally a greyish-white, sometimes tinged with yellow or red and, very rarely, rather warmer in colour. The markings consist of tiny specks of yellowish- and reddish-brown with others, fewer in number, of blackish-brown and, again, if very carefully examined, secondary specks of grey and lavender.

in most eggs these specks cover the whole surface profusely but in nearly all they are larger and more numerous still at the larger end. In a few eggs the specks give place to larger blotches and black spots. In shape they vary from peg-top to broad obtuse ovals and in texture they are fine, very hard and stout, often with a pronounced gloss. Forty-seven eggs average 23·3 × 19·1 mm.: maxima 25·3 × 19·1 and 24·2 × 19·6 mm.; minima 22·0 × 17·3 mm. The domestic arrangements of this race are, like those of the Burmese Bustard-Quail, more fully described later on.

Habits. This Bustard-Quail is found over most of the plains of Ceylon where the ground is more or less open and cultivated. It is less common in the hills but ascends occasionally as high as 4,000 feet, whence I have had eggs sent me with the cock-bird caught on the nest. It is an inveterate little skulker but not shy of humanity, often entering and breeding in gardens and perhaps more common in patches of grass or scrub round villages than anywhere else. When forced to rise they fly straight as a dart with whirring wings and very fast for fifty or sixty yards, and then drop as if shot into cover again. They run with great speed. Their food consists of seeds and insects and they are generally very fat and make delicious morsels on toast for those who can find it in their hearts to shoot them.

(1097) Turnix suscitator plumbipes.

THE BURMESE BUSTARD-QUAIL.

Hemipodius plumbipes Hodg., Icon., ined. in Brit. Mus., Nos. 126, 127 (Nepal).
Turnix pugnax Blanf. & Oates, iv, p. 150 (part.).

Vernacular names. *Timokpho* (Lepcha); *Tinisk* (Bhutia); *Ngón* (Burmese); *Sunsorai* (Assamese); *Daoduma* (Cachari); *Inruibuma* (Kacha Naga); *Vohbubum* (Kuki); *Purjoh* (Malay); *Guskecoone*, *Vock-coone* (Siamese).

Description.—Adult female. Similar to the Ceylon Bustard-Quail but wanting the rufous nuchal collar. It is also a rather darker bird with more rufous on the upper parts and the black not quite so rich and velvety. The underparts are usually paler.

Measurements. Wing, ♀ 82 to 98 mm., ♂ 77 to 90 mm.

Distribution. The North and North-West Chin and Kachin Hills, N. Arrakan, Chittagong and its Hill Tracts, the whole range of country, plains and hills, extending West as far as Sikkim throughout Assam and the Bengal Dooars and Nepal, together with the wetter, better-forested districts at their base, from Mymensingh to Bettiah in Behar, where, however, it meets the Southern form *taijoor* and intergrades with it.

Rothschild records three geographical races, *plumbipes*, *taijoor* and *rostrata* (=*blakistoni*) from Yunnan but only the last-named can occur there, some individual birds perhaps somewhat approaching *plumbipes*.

Nidification. These birds breed practically all the year round, principally between April and September, and one hen will apparently go on laying eggs as long as she can find a supply of husbands to hatch the eggs she lays and to look after her innumerable progeny when hatched.

Dr. H. E. Butler, quoting from the German of Huth, tells us that in 1890 a female *Turnix nigricollis* laid no fewer than eight clutches of eggs and from three of these young were hatched. It must, however, be noted that Huth speaks of the female as being "a pattern of love, attention and solicitude towards the little chicks."

I have had *plumbipes*, *tanki* and *dussumieri* in captivity but I found that, though I could keep any numbers of the males together, I could not keep two females, as they always fought until one was disabled.

It is the cock-bird that has to do all the hatching and looking after the young, for the hen, as soon as she has laid her first set of eggs, goes off to hunt up another male to look after her second laying, and so on, until matrimony palls for the season and she either indulges in lonely blessedness or joins one or two other ladies who are also grass widows for the time being.

The male, having hatched the eggs, a process which takes about twelve days, then looks after the young and brings them up, performing his duties in the most admirable manner, feeding, tending them with the greatest solicitude, brooding them at night and fighting for them against all possible enemies, sometimes including their mother, with the greatest bravery.

The nest is like that of the preceding bird but almost invariably there is a good lining of grass in the hollow selected, which may be in any kind of grass-land, scrub, bush, or suitable grain-crop. Occasionally a nest of this species is made in tufts of grass, the blades of which are employed to make sides and roof to the nest and sometimes, in addition, a little tunnel through which the cock-bird steps to and from the nest.

The eggs are just bigger editions of those of the Ceylon Bustard-Quail. Sixty average 24·9 × 20·2 mm.: maxima **27·5** × 20·8 and 25·3 × **20·9** mm.; minima **22·1** × **17·0** mm.

Habits. Similar to those of the preceding bird. The female is extremely pugnacious and her loud booming call, "boom-boom-boom," may be heard morning, noon and night during the breeding-season, when the females fight desperately for the possession of the male. So fiercely do they fight that they may sometimes be caught with a cloth when so engaged and the natives trap great numbers through female decoy birds and then keep or sell them as fighting birds.

They are found in all kinds of jungle other than deep forest but prefer scrub and grass-lands in cultivated country. They occur as high as 8,000 feet in the Himalayas and in the hills of South Assam are quite common up to 5,000 and even 6,000 feet.

(1998) Turnix suscitator taijoor.

THE COMMON BUSTARD-QUAIL.

Hemipodius taijoor Sykes, P. Z. S., 1832, p. 155 (Deccan).
Turnix pugnax. Blanf. & Oates, iv, p. 150 (part.).

Vernacular names. *Gulu, Gaudlu, Gundra, Salui-gundra* (Hind.); *Pureḍ*, female, *Kaḷada*, male (Telegu); *Kurunj-ḳadik*, female; *Inkadik*, male (Tamil); *Durwa* (Ratnagiri); *Karechaki* (Cahârese).

Description.—Adult female. Differs from *T. s. leggei* in being much paler and much more rufous, many birds appearing, as a whole, to be a bright but rather pale rufescent-red. The pale fulvous edges to the feathers of the back, scapulars etc. are larger and paler, increasing the pale effect of the plumage, whilst the underparts are generally very much paler. The black spots on the wing-coverts, though smaller, are more in the nature of bars than they are in any of the other subspecies.

Colours of soft parts as in *T. s. leggei*.

Measurements. The Common Bustard-Quail follows the general avian rule in being smaller in the South than its more Northern and Eastern representatives.

The British Museum series—a large one—gives the wing-measurements for females as 77 to 88 mm.

Adult male. Differs from the female in the same way and degree as does that of the other subspecies.

Measurements. The male, as usual, is decidedly smaller than the female—wing 72 to 85 mm.

Distribution. The whole of India South of the habitat of *T. s. plumbipes* down to Cape Cormorin. It has not yet been recorded from Sind but I have recently had it sent to me from the Punjab, where it would appear to be only a rare straggler. In the districts round Calcutta it is replaced by *T. s. isabellinus*.

Nidification. Not to be distinguished in any way from that of *T. s. plumbipes*, though, if Hume is correct, this Continental form would appear very often to be contented with laying its eggs in some hollow without making a true nest. Even in such cases, however, a rough collection of scraps of grass etc. are always placed in the hollow before the eggs are laid.

The season for laying may vary somewhat in different places but it may be said to last more or less all the year round. Scarcity of food naturally checks breeding, so that in the driest portions of its habitat the driest months of the year will form a gap in breeding operations and, on the contrary, where the rainfall is heaviest the birds will cease breeding during the height of the Rains.

The eggs are exactly like those of *T. s. plumbipes* and vary in colour to the same extent. Sixty average 24·7 × 19·4 mm.: maxima **26·5** × 20·1 and 23·9 × **20·4** mm.; minima **23·0** × 18·1 and 24·2 × **17·9** mm.

Habits. Those of the species.

(1999) Turnix suscitator blakistoni.

THE CHINESE BUSTARD-QUAIL.

Areoturnix blakistoni Swinhoe, Ibis, 1871, p. 401 (Canton).
Turnix pugnax. Blanf. & Oates, iv, p. 150 (part.).

Vernacular names. *Guske-coone*, *Nock-coone* (Siamese); *Nyôn* (Burmese).

Description.—Adult female. This is the most richly coloured of all the forms of the Bustard-Quails, the upper parts being very boldly marked with black and deep rufous, the latter of a darker, redder tint than is found in any of the other subspecies.

Colours of soft parts are the same as in *T. s. leggei*.

Measurements. Females: wing varying between 88 to 94 mm. The males, as usual, are decidedly smaller, with a wing of 78 to 92 mm.

Distribution. South and Western China, the hill-ranges of Yunnan and Northern Siam into the Eastern Shan States; Annam, Tonkin, and Karenni.

Nidification. Exactly the same as that of *T. s. plumbipes* and the eggs are not to be distinguished from those of the latter bird. Thirty-two average 24·1 × 20·4 mm.: maxima **27·2** × **21·1** mm.; minima 22·1 × 19·0 and 24·0 × **18·3** mm.

Habits. So far as is recorded, there appears to be nothing to note in the habits of this bird differing in any way from those of its nearest relations. It is found alike in the plains and certainly up to 4,000 feet and probably higher in the mountains. Like other Bustard-Quails also it keeps much to openings in partly-forested country and is often found in cultivation and round villages.

(2000) Turnix suscitator isabellinus.

THE CALCUTTA BUSTARD-QUAIL.

Turnix suscitator isabellinus Robinson & Stuart Baker Bull. B.O.C., xlviii, p. 62 (1928) (Calcutta).
Turnix pugnax. Blanf. & Oates, iv, p. 150 (part.).

Vernacular names. *Gulu*, *Gundra* (Hind.).

Description. A very pale form, nearest perhaps to the pale form from the dry zone in Burma but with the general tint more

isabelline and less rufous; the white lines on the upper plumage are very fine; the underparts are very rufous and dark in comparison with the upper.

Colours of soft parts as in the other forms.

Measurements. Wing, ♀ 83 to 84 mm., ♂ 77 mm.

Distribution. Calcutta; 24th Parganas, Hooghly, Nadia. There are three specimens in the British Museum collection and I have seen others from the districts mentioned.

Nidification. Jerdon and Parker both took numerous nests of this race in the Botanical Gardens and round about Calcutta during July and August. I personally took eggs in other parts of the 24th Parganas as well as in Hooghly and Nadia, though they were not common except in the first-named district. The eggs were always four and both they and the nests indistinguishable from those of the other races. The only eight I have measured average 24·2 × 19·9 mm.

Habits. Those of the species. This little Quail was common in the scrub round about Calcutta, Barrackpore and Serampore, often entering the gardens and parks on the outskirts of these places.

(200) Turnix suscitator interrumpens.

THE TENASSERIM BUSTARD-QUAIL.

Turnix suscitator interrumpens Robinson & Stuart Baker, Bull. B. O. C., xlviii, p. 60 (1928) (Kossoom).
Turnix pugnax. Blanf. & Oates, iv, p. 150 (part.).

Vernacular names. *Ngon* (Burm.); *Gaske-coone, Nock-coone, N-k-hum-maw* (Siam).

Description. This race is rather close to *plumbipes* but has the upper plumage very grey, nearly devoid of rufous markings and with the black bars almost obsolete; on the other hand, the buff and white markings are also inconspicuous, the upper plumage having a very uniform appearance when compared with *T. s. atrogularis*, the South Malayan form.

Colours of soft parts as in the other races.

Measurements. Wing, ♀ 81 to 90 mm., ♂ 73 to 87 mm.

Distribution. Peninsular Siam and Burma to North-East Siam. In Burma the Northern limit is approximately lat. 20°, running up further North on the East.

Nidification. Herbert found this Quail breeding during June, July, and August in Siam and gives the average size of the eggs taken by him as 23·5 × 20·0 mm.

Habits. Those of the species.

(2002) Turnix suscitator pallescens.

THE PEGU BUSTARD-QUAIL.

Turnix suscitator pallescens Robinson & Stuart Baker, Bull. B. O. C., xlviii, p. 60 (1928) (Thayetmyo).
Turnix pugnax. Blanf. & Oates, iv, p. 150 (part.).

Vernacular names. *Ngon* (Burm.).

Description. This is a much paler dry-zone form, approximating the dry-zone form, *taijoor*, of India; the white striations on the upper surface are broad and conspicuous but there are no red bars as in *blakistoni* or black as in the Southern forms. The tint is decidedly rufous-grey, not isabelline as in *isabellinus*.

Colours of soft parts as in the other races.

Measurements. Wing, ♀ 80 to 88 mm., ♂ 80 to 83 mm.

Distribution. The dry zone of Central Burma in Pegu, roughly from Rangoon to Thayetmyo and Tounghoo but not so far as is yet known, crossing the Sittoung.

Nidification. Oates took the eggs of this form in Pegu in August and Hopwood and Wickham took others between June and that month. They are just the same as those of the other races but no measurements have been recorded.

Habits. Those of the species.

(2003) Turnix dussumieri.

THE LITTLE BUTTON-QUAIL.

Hemipodius dussumieri Temm., Pl. Col., v, p. 454 (1828) (India).
Turnix dussumieri. Blanf. & Oates, iv, p. 152.

Vernacular names. *Ginwa Lawa*, *Chota Lawa*, *Dabki* (Hind.); *Tura Shimaj* (Muttra); *Libbia* (Purnea); *Darwi* (Ratnagiri); *Chinna* or *Tella-dabba Gandla* (Tel.); *San Gundla* (Ooriya); *Choto Sansorai* (Assamese); *Dao-duma kashiba* (Cachari); *Inrui-buma gajeba* (Naga); *Tutu-butera* (Sind); *Ngon* (Burmese); *Nok-kum-kerp* (Siam).

Description.—Adult male and female. A distinct mesial stripe from forehead to back of crown pale buff; sides of the crown rufous-brown to brown, generally much mixed with black, whereas the mesial stripe is often unspotted and seldom heavily marked; lores, supercilia and sides of the head white or buffy-white, speckled with black; back of the neck ferruginous-red to dull ferruginous; back, rump and upper tail-coverts barred black and rufous, the rufous varying from a bright tint to a dull greyish-rufous and the amount of black varying greatly in individuals; here and there, more especially on the rump, a few of the feathers are very narrowly margined with whitish and some of the outer tail-coverts have the outer webs edged with

buff; the black is nearly always more strongly developed on the rump and upper tail-coverts than on the back; scapulars, inner wing-coverts and innermost secondaries like the back but with broad buff margins to each feather; other wing-coverts rufous with a black spot on the outer web and broad buff margins, in some birds this buff margin occupying nearly all the visible portion in the closed wing; bastard-wing and primary-coverts grey-brown with buff edges; primaries brown, or grey-brown, with buff edges, broad and distinct on the outer, narrow and sometimes abraded on the inner; chin and throat white, centre of breast rufescent, sides of breast and flanks white or buffy-white, with bold drops of black and more or less numerous patches of chestnut; remainder of lower parts white, often tinged with buff and sometimes with chestnut; the lower tail-coverts nearly always of this colour.

Colours of soft parts. Legs and feet pale fleshy-white to light lead-colour or pale blue-grey; bills leaden-white or fleshy-white to lavender or plumbeous; iris light yellow to straw-white.

Measurements. Wing, ♀ 73 to 75 mm., ♂ 61 to 71 mm.; tail about 31 to 37 mm.; tarsus about 18 to 20 mm.; culmen about 10 to 11 mm. Weight 1¼ to 1½ oz.

Young birds. "In the young birds the whole of the upper plumage is reddish-brown, becoming brighter rufous on the nuchal region, indistinctly barred with blackish-brown and spotted with white, especially on the wing-coverts and chest. The latter is paler buff than that of the adult and spotted all over with black" (*Ogilvie-Grant*).

The nestling in down is not distinguishable from the nestling of *Turnix s. leggei*.

It is quite impossible to divide this little Bustard-Quail into subspecies. Two specimens in the British Museum collection, from Formosa, one from Sambalpur, another from the Deccan, and yet one more from East Burdwan, all females, can be picked out from the rest by their rich plumage. All these five are, however, identical and their distribution over so scattered an area at once disposes of the question of their difference in coloration being of a subspecific value; moreover, they are closely approached by a few specimens from Raipur and other parts of Central India.

It is curious to note that many specimens from Pegu are rather paler than birds from other parts of Burma, just as are specimens of *Turnix suscitator*, though these latter agree with the dark Malayan and Eastern form rather than with the South Indian ferruginous bird.

The range of individual variation in *Turnix dussumieri* is not nearly as great as it is in *Turnix suscitator* and consists principally in the amount of black barring on the upper plumage and the extent of the buff margins to the feathers of the wings and

scapulars. As these are plentiful, or the reverse, so is the general aspect of the bird itself, dark or pale. The rufous of the nape and neck does not vary much in colour, though a good deal in extent, whilst the rufous of the upper back is often a more grey-brown than red and this, of course, also affects the general appearance considerably.

Distribution. This tiny Game-bird is found practically throughout India as far South as Travancore, from the Southern part of which I have received two male specimens with their eggs. From this State it extends North in every direction as far as the Himalayas, ascending these to at least the height of 8,000 feet. It occurs in all the hill-ranges of Assam and I have personally often taken it in the Khasia Hills, Cachar Hills, Naga Hills and up the Assam Valley as far East as Dibrugarh and Sadiya. It is also found in Cachar, Sylhet, Tippera, Chittagong and the Chittagong Hill Tracts. Further East it has been obtained by one of my native collectors in the Shan States. Oates got specimens in Pegu, Herbert records it as not uncommon about Bangkok in Siam and Swinhoe obtained it in Formosa and Hainan.

Doubtless it will be found to occur in all the districts of Burma and through the lower hill-ranges into Western China.

Naturally from certain parts of the country it is debarred either by the heaviness and denseness of the forests or, on the other hand, by the dryness and bareness of the plains. To the North-west it, perhaps, only wanders during the Rains and in these parts is semi-migratory, to the extent of moving when, literally, a place becomes too hot to hold it. Elsewhere it is certainly a resident bird, breeding wherever found.

Nidification. The Little Button-Quail breeds practically throughout the year but most regularly from June to August and least often from January to March. Their nests are similar to those of the other species of *Turnix* and they select very similar sites for them but domed nests are very rare. They breed all over the plains and up in the hills to a considerable elevation. On the Nilgiris and hills of Southern India they occur everywhere up to the peaks and in the Himalayas they have been reported above Simla on the West and above Darjeeling on the East over 8,000 feet. In the hills South of the Brahmapootra they breed up to about 7,000 feet in the Naga Hills.

The eggs resemble those of the other Bustard-Quails but are much more richly marked, the freckles giving place to bold blotches of colour. Sixty eggs average 21·3 × 17·3 mm.: maxima 23·2 × 19·2 mm.; minima 19·7 × 15·9 mm.

Habits. Those of the genus. The boom of the female is rather softer than that of the species *suscitator* but she is just as pugnacious and fights unconscious of everything round her when battling for her temporary husband.

Turnix maculatus.

The name *maculatus* of Vieillot has been rejected by authors following Ogilvie-Grant, on account of its having the same meaning as *maculosus* of Temminck. This seems to be a quite unnecessary rejection and I therefore retain it as the specific name and our Indian birds will have to be known as *Turnix maculatus maculatus* (=*Turnix blanfordi* auctorum) and *T. m. tanki*.

Key to Subspecies.

A. Larger; wing, ♂, over 90 mm. ..... *T. m. maculatus*, p. 453.
B. Smaller; wing, ♂, under 90 mm. ..... *T. m. tanki*, p. 454.

(2004) Turnix maculatus maculatus.

THE BURMESE BUTTON-QUAIL.

Turnix maculatus Vieill., Nouv. Dict. d'Hist. Nat., xxxv, p. 47 (1819) (Assam).
Turnix blanfordi. Blanf. & Oates, iv, p. 155.

Vernacular names. *Ngon* (Burmese); *Dao-duma gajao* (Cachari); *Inruibama ghéhérba* (Naga).

Description.—Adult male and female. Similar to the next bird but very much bigger. Adults are darker and retain a greater amount of black barring on the back; the sides of the crown are more marked with black and the pale edgings to the feathers of the back are very conspicuous.

Colours of soft parts. Iris white. In the male the bill is pale horny-brown, with a tinge of yellowish flesh-colour or yellowish at the base of the maxilla and on the mandible, tip and apical half of culmen a darker brown; legs, feet and claws yellowish, in some cases rather fleshy and in some a more distinct yellow.

In the female the bill is paler and more yellow.

Measurements. Wing, ♂ 92 to 96 mm., ♀ 97·5 to 105 mm.

Distribution. Assam in the Surrma Valley, all Burma, Shan States, Siam and thence through Yunnan and China to Manchuria. Assam birds North of the Brahmapootra and on the North of the Watershed of the Barail range and Patkoi Hills falling into the Brahmapootra seem all to be nearer *T. m. tanki* than to the typical form.

Nidification. The Burmese Button-Quail breeds commonly from the plains up to 4,000 feet and less often up to 6,000 feet over the whole of its range. It keeps to widespread areas of grass-land, scrub, bush and bamboo-jungle, seldom if ever entering real forest. It likes dry places for nesting and keeps to the higher slopes of hills, or to the tops in preference to the bottoms of ravines. Otherwise its nesting-habits are much the

same as those of the rest of the genus. The eggs, always four in number, only differ in their large size from other *Turnix* eggs but they are mostly of the speckled *suscitator* type rather than the blotched *dussumieri* type. One hundred eggs average 25·5 × 20·8 mm.: maxima 28·1 × 21·1 and 27·0 × 22·2 mm.; minima 22·2 × 20·0 and 25·3 × 18·8 mm.

Habits. Those of the genus. Except that this Button-Quail is when first disturbed more prone to take to wing than the other species and subspecies, there is nothing special to record about it. The voice of the female is the same loud challenge and the male has the same little note to its young, sounding like "chuck chuck."

The hen-bird must lay many clutches of eggs in a season, for directly she has laid one set, she commences to boom again and I have found fresh eggs laid within a few yards of others almost hatching and as no hen-bird would permit another hen to come so close, the presumption is that they were all laid by one bird.

(2005) Turnix maculatus tanki.

THE INDIAN BUTTON-QUAIL.

Turnix tanki Blyth, J. A. S. B., xii, p. 180 (1843) (India); Blanf. & Oates, iv, p. 153.

Vernacular names. *Lowa* (Upper India); *Pedda dabba gundla* (Telegu). In most places the natives do not distinguish between this bird and the Common Bustard-Quail.

Description.—Adult female. From forehead to nape barred buff and brown with indications, sometimes well defined, of a buff mesial stripe; nape, neck and extreme upper back bright ferruginous-red; remainder of upper parts, including inner wing-coverts and innermost secondaries, greyish-brown, occasionally an almost vinous tint, profusely barred with fine wavy lines of deep brown or dull black, giving these parts a vermiculated appearance; remaining wing-coverts buff or brownish-buff with a broad-subterminal drop or short bar of deep brown; inner secondaries like the back, those next them more or less freckled with rufous at the tip and with black and buff on the outer web near the tip; primaries, outer secondaries and primary-coverts greyish-brown edged with buff on the outer webs; edge of shoulder buff; below from chin to upper breast reddish-ferruginous albescent, often pure white on chin and throat; the same colour on the upper breast as on the neck, these parts forming a broad collar; remainder of lower surface buff, deepest on the breast and flanks and sometimes almost pure white on the centre of the abdomen; the breast next the collar in the centre, the sides of the collar and the rest of the breast and flanks nearly as far down as the thighs with large, round or crescentic spots of black.

Females.—**Adult, but not so old as that above described,** have the mesial line more strongly marked, the sides of the head are often much marked with rufous and the black barring is very broad and prominent; the whole of the upper parts are much more heavily spotted and barred with black; the scapulars, and sometimes the back also, have drops of buff succeeded by black on the outer webs of the feathers, sometimes becoming buff streaks on the former; the inner secondaries and the wing-coverts are a purer buff, whilst the black drops or bars are far more numerous; the inner secondaries also as a rule have a good deal of rufous mixed with the vermiculations; below, the colour is much like that of the older female but the grey-brown colour of the back often encroaches on the sides of the breast, the black markings are more numerous and are occasionally mingled with pale buff spots; the chin and throat are nearly always paler and almost, if not quite, white, whilst the buff of the belly is whitish, the centre of the abdomen being often pure white.

Colours of soft parts. Iris straw-colour or white, probably always white in old birds. Bill fleshy-white, greyish-white or pale plumbeous, always with a yellowish tinge at the base and sometimes darker and brownish on the culmen; legs and feet yellow, fleshy or fleshy-grey, sometimes with a tinge of orange; claws the same.

Measurements. Wing 79 to 89 mm.; tail 35 to 40 mm.; tarsus about 23 to 25 mm.; culmen about 12 to 13 mm.

Adult male. The adult male is similar to the first stage adult female but entirely wants the chestnut collar, the centre of the breast is a paler, duller rufous-buff and the general appearance of the upper parts is less bright, though the vermiculations are larger, in places becoming almost bars.

The young male resembles the second stage of female described but has no rufous collar. The colours of the soft parts are the same as in the female but the bill is said to be brown on the culmen and at the tip. I have not noticed any difference between the bills of males and females.

Measurements. Males: wing 71 to 79 mm.

Quite young females have the nuchal collar very indistinctly shown and are plentifully spotted with white, whilst the feathers of the other parts are profusely barred with dull black; the white and buff markings of the scapulars and inner quills are almost entirely wanting, being represented only by a few pale spots on the outer webs of the quills and coverts; the primaries are margined and freckled with dull rufous on the outer webs, whilst the other secondaries have a pale margin with blackish submargin to the outer webs which are much freckled with dull rufous; the underparts are duller than in the adult and are less boldly spotted with black and rufous.

The nestling closely resembles that of *Turnix suscitator taigoi* already described.

Hitherto *Turnix albiventris* from the Nicobars and *Turnix blanfordi* have both been treated as good species but, after a very careful examination of all the material at my command, I cannot discover any difference between *T. m. tanki* and *T. albiventris*, upon which it is possible to make the one a different species or even subspecies to the other.

Distribution. The Indian Button-Quail is found over practically the whole of India but it does not, apparently, occur in Ceylon. Hume received specimens from South Travancore. I have had specimens sent me from near Tinivelli in the extreme South of Madras and also specimens from Mysore, whence it had not previously been recorded. In the North-West it straggles into the Punjab but probably only during the rainy season; it is found throughout Bombay and the North-West Province and thence East everywhere as far as Calcutta. In the furthest North-East it extends throughout the Assam Valley to Dibrugarh and Sadiya, but South of the Brahmapootra Valley it is replaced in most parts by *Turnix m. maculatus*, though a specimen from Tippera in the Hume Collection is nearer *T. m. tanki* than *T. m. maculatus*. I never came across it either in the Cachar Hills, Khasia Hills or Surrma Valley and I think I may say it does not occur there. It ascends the hills to a considerable height, for it has been found in the Nepal Hills up to 4,000 feet; Finn found it in Darjeeling at over 6,000 feet; in native Sikkim it has been obtained up to 7,500 feet (in the month of June) and in the Travancore Hills and Palnis up to 4,000 feet; finally, it occurs commonly in the Nicobars and also in the Andamans.

Nidification. Wherever the Indian Button-Quail is found it breeds but there is curiously little recorded so far as to its habits in this respect in a wild state.

Hume records eggs taken on the 15th of July and 26th of August and there are others in the Hume Collection in the British Museum taken on the 29th of April and one in June. From Bengal and Behar I have eggs taken in May and June, though the normal months are July, August and September; Dibrugarh in July and August; Gowhaty, May and June and Tezpur, June. There appear to be no records of its breeding in any of the cold-weather months from November to March. The few nests I have personally seen were just like those of the Common Bustard-Quail and, like those of that bird, the nest is sometimes roughly domed, sometimes a well-made pad and sometimes a rather meagre affair of grass and roots in a natural hollow. The nest is placed in much the same sort of position as is that of its relations already described, though it adheres more closely to grass-land for nesting-purposes and it also likes grass which is rather thin and scanty with ample room to run about in. The

full clutch of eggs is almost invariably four and they closely resemble those of the Little Button-Quail but, as a series, are rather less boldly marked. Sixty eggs average 22·3 × 17·9 mm : maxima 24·4 × 19·0 and 24·2 × 18·1 mm. ; minima 20·1 × 17·1 and 22·0 × 16·8 mm.

Habits. Very similar to those of other species of the genus but perhaps more restricted to scrub, grass-lands and growing crops of millet and other grain. It occurs in thin Sal and other deciduous forest but never in thick evergreen.

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