

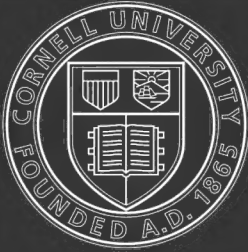


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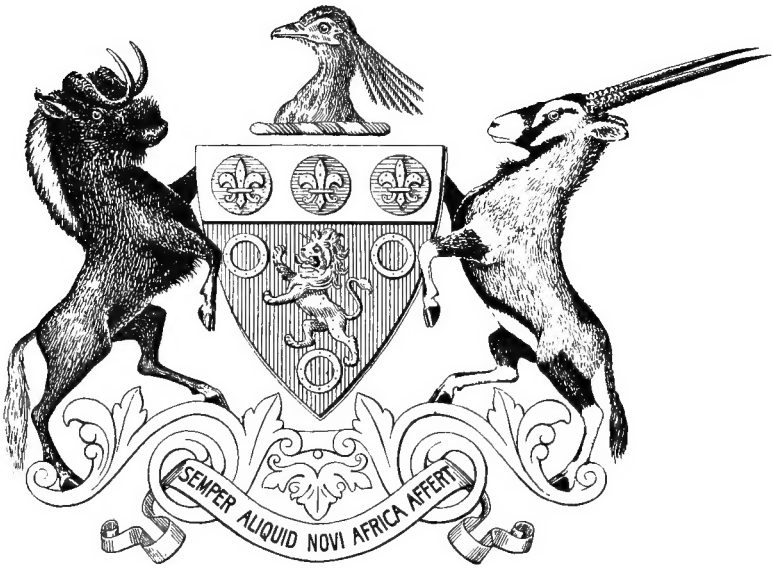
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THE
FAUNA OF SOUTH AFRICA



EDITED BY

W. L. SCLATER, M.A., F.Z.S.

Director of the South African Museum, Cape Town.

THE
BIRDS OF SOUTH AFRICA

COMMENCED BY

ARTHUR STARK, M.B.

VOL. III.

PICARIANS, PARROTS, OWLS AND HAWKS
WITH 141 ILLUSTRATIONS

BY

W. L. SCLATER, M.A., F.Z.S.

Director of the South African Museum, Cape Town

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PREFATORY NOTE.

THE present volume contains an account of 183 species of birds included in the orders Picariæ, Psittaci, Striges and Accipitres. For the contents of this volume I am alone responsible, although I have been able to make use of the late Dr. Stark's note books and journals. I must again thank my many friends and correspondents for help freely and generously rendered, and especially am I indebted to Mr. A. D. Millar of Durban, to Mr. Ivy of Grahamstown, and to Mr. John Wood of East London. As in previous volumes the illustrations with a few exceptions have all been drawn specially for this work by the skilful hand of Mr. Grönvold. The photograph of the Pied Kingfisher on page 75, was kindly lent to me by Mr. H. E. Harris. For the use of the blocks of figures 62 and 68, prepared from photographs given me by Mr. Ivy, I am indebted to the editors of "The Ibis"; while the photographs of the nests of the Sea Eagle on page 313, and of the South African Harriers on pages 377 and 378, were given to me for purposes of reproduction by Mr. A. D. Millar and Captain Moore of the Army Pay Department respectively. As the volumes previously issued dealt only with the single order of Passeres I have here thought it worth while to append an artificial key of the rest of the Orders of Birds in order to assist the tyro to determine the position of an unknown form in the classification here adopted.

W. L. S.

KEY OF THE ORDERS.

.1. With four toes.

a. Wings well-developed and used for flight.

*a*¹. Toes free from one another or only partially webbed.

*a*². Hind-toe jointed at the same level as the other toes.

*a*³. Thighs and usually the upper portion of the shanks feathered.

*a*⁴. No cere at the base of the bill Passeres and Picariæ.

*b*⁴. A soft fleshy cere at the base of the bill.

*a*⁵. Toes zygodactyle, 2nd and 3rd forwardly, 1st and 4th backwardly directed..... Psittaci (Parrots).

*b*⁵. Outer or fourth toe reversible at will ; eyes and face more or less forwardly directed Striges (Owls).

*c*⁵. Toes normally arranged 2nd, 3rd, 4th, forwardly, 1st backwardly directed.

*a*⁶. Bill and claws strong, curved, hooked and sharp pointed Accipitres (Hawks).

*b*⁶. Bill and claws weak and straight Columbæ (Doves).

- b*³. Lower portion of thighs
and all the shanks naked
without feathers; bill
very long, straight and
pointed Herodiones (Heron).
- b*². Hind toe raised at the joint
above the level of the
other toes.
- a*³. Lower portion of thighs
naked, without feathers.
- a*⁴. Toes very long, middle
one longer than the
shank Ralli (Rails).
- b*⁴. Middle toe hardly ever
equal to the shank ... Limicolæ (Waders) [in part].
- b*³. Lower portion of thighs
clothed with feathers;
spurs generally present,
in the males, at least ... Gallinæ (Game-birds).
- b*¹. Three front toes completely
webbed, hind toe free.
- a*². Bill compressed or long and
pointed..... Gaviæ (Gulls).
- b*². Bill depressed and flattened,
never sharp-pointed Anseres (Ducks).
- c*². Bill bent downwards in the
middle, lower mandible
fixed, upper mandible
movable. Phœnicopteri (Flamingoes).
- c*¹. All four toes with lateral lobe-
like expansions Pygopodes (Grebes).
- d*¹. All four toes turned forwards
and completely webbed Steganopodes (Duikers).
- b*. Wings without quills, not used
for flight, modified as a swim-
ming organ, three toes com-
pletely webbed Sphenisci (Penguins).

- B.* Three toes only; hind toe absent; toes free or not completely webbed.
- a.* Lower portion of thighs clothed with feathers.
- a*¹. Shanks covered with transverse scales before and behind Hemipodes (Button Quails).
- b*¹. Shanks covered with small scales Otidæ (Bustards).
- b.* Lower portion of thighs naked Limicolæ (Waders) [in part].
- C.* Two toes only; wing not used for flight Struthionæ (Ostriches).

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THE FAUNA OF SOUTH AFRICA.

A V E S .

Order II. PICARIÆ.

THE order Picariæ contains a number of well-marked families, most of them separable by clearly-defined characters, whereas it is almost impossible at present to give a clear and definite diagnosis of the order itself.

The members of this order agree with those of the *Passeres*, in that the young are hatched naked and helpless, and do not usually pass through a downy stage, and in that the toes are not webbed to any extent and are all placed on the same level. On the other hand, they differ from the *Passeres* in having a desmognathous palate (except the Woodpeckers and Swifts), and in having the deep plantar tendons connected by a vinculum.

The following drawings are given to illustrate some of the more important anatomical characters used in separating the orders and families of birds, most of which are due to the genius of Nitsch, Huxley and Garrod.

I.—The Pterylosis or arrangement of feathers on the hind neck and back. This, as a rule, consists of a median row of feathers separated by two parallel bare tracts running on either side. This arrangement holds good in the case of all Picarians, except the Hornbills. When this line of feathers is defined on the neck it may be forked on the upper back or on the lower back, or not forked at all (fig. 1, p. 2).

II.—The variations in the arrangement of the deep plantar tendons in the tarso-metatarsus were first noticed by Garrod; we may distinguish six modifications of these.

(a) *Passerine*, in which the *flexor perforans digitorum* splits into three to supply the second, third and fourth toes, while the *flexor longus hallucis* supplies the hallux only, and is quite free from the other tendon (fig. 2a, p. 2.)

(b) *Galline*, in which the *flexor perforans digitorum* supplies the second, third and fourth toes as before, while the *flexor longus hallucis* is connected with it by a vinculum and supplies the hallux only, or any one or more of the other digits as well (fig. 2b).

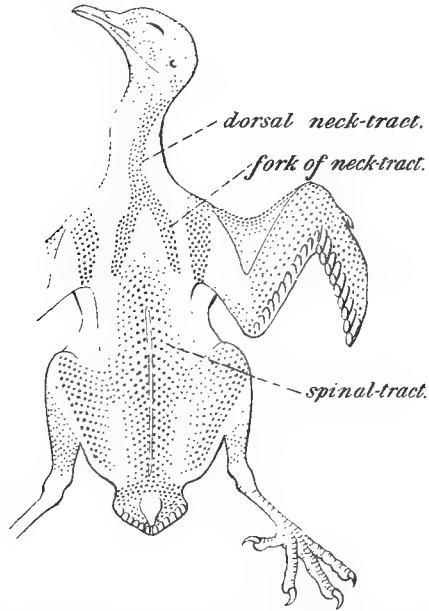


FIG. 1.—Diagram of a Pigeon, with the feathers removed to show the arrangement of the feather tracts (after Nitsch).

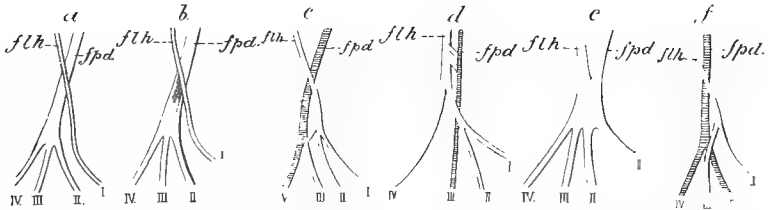


FIG. 2.—Diagram of the modifications of the deep plantar tendons of the feet of birds: *flh*, *flexor longus hallucis*; *fpd*, *flexor perforans digitorum*; a, Passerine; b, Galline; c, Trogonine; d, Picine; e, Coraciine; f, Upupine.

(c) *Trogonine*, in which the *flexor perforans digitorum* supplies the third and fourth toes only, the *flexor longus hallucis* leads to the first and second, and is also connected with the *flexor perforans digitorum* (fig. 2c).

(d) *Picine*, in which the *flexor perforans digitorum* leads to the third digit only, and the *flexor longus hallucis* supplies the first, second and fourth digits, and is also connected with the *flexor perforans digitorum* (fig. 2d).

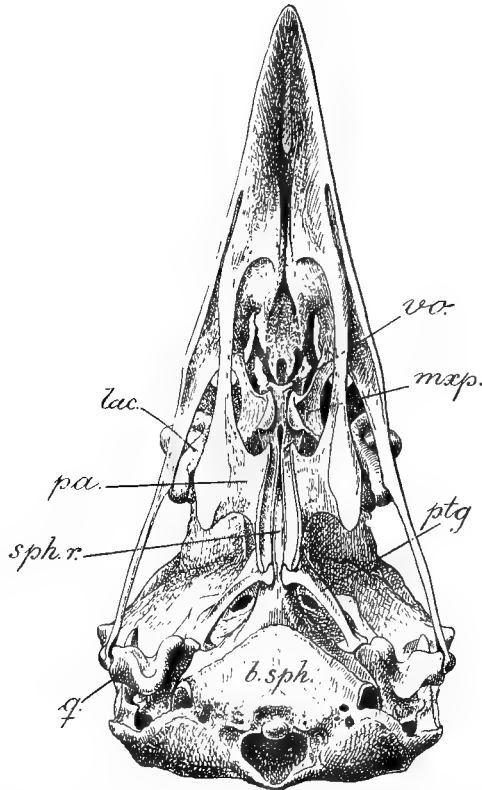


FIG. 3.—Base of the skull of *Corvultur albicollis* showing the aegithognathous arrangement of the palate-bones: *vo*, vomer; *map*, maxillo-palatines; *lac*, lacrymal; *pa*, palatine; *sph.r.*, sphenoidal rostrum; *b.sph.*, basi-sphenoid; *ptg*, pterygoid; *q*, quadrate.

(e) *Coraciine*, in which the two tendons are coalesced; the *flexor perforans digitorum* supplies either the first, second and third, or all four digits; the *flexor longus hallucis* supplies either the third and fourth, or second, third and fourth digits (fig. 2e).

(f) *Upupine*.—The *flexor longus hallucis* joins the head of the

flexor perforans digitorum which supplies the third toe; so that while the fourth and second toes are supplied by the *flexor perforans digitorum*, and the first by the *flexor longus hallucis*, the third is supplied by a twig from both tendons (fig. 2f).

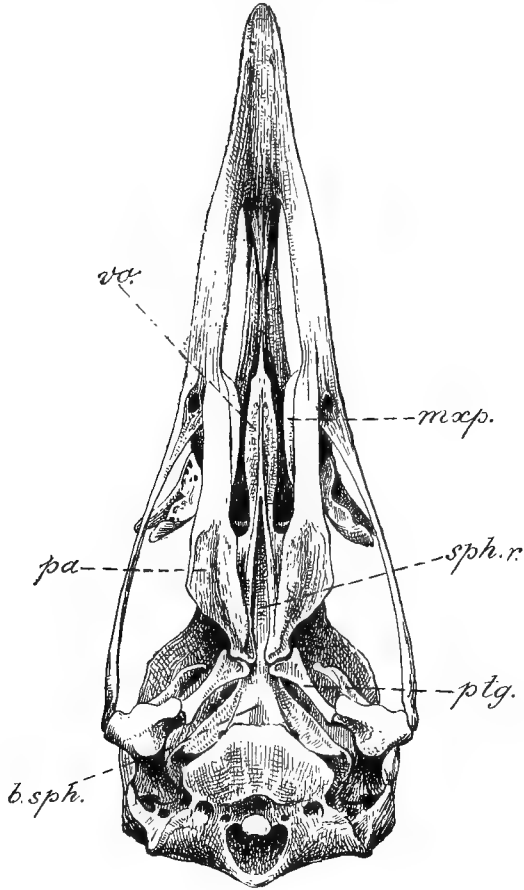


FIG. 4.—Base of the skull of *Grus pavonia*, showing the schizognathous arrangement of palate-bones: *vo*, vomer; *max.p.*, maxillo-palatines; *pa*, palatine; *sph.r.*, sphenoidal rostrum; *ptg.*, pterygoid; *b.sph.*, basi-sphenoid.

III.—The oil gland is situated on the dorsal side of the tail of the bird just at the root of the tail feathers; it may be present or absent, and if present it may be surrounded by a tuft of feathers or nude.

IV.—The cæca are two little blind tubes springing from the intestine at the commencement of the rectum or hinder part of the gut. In a broad way they are best developed in purely herbivorous birds, and small or short in meat- and fruit-eaters; sometimes they are entirely absent.

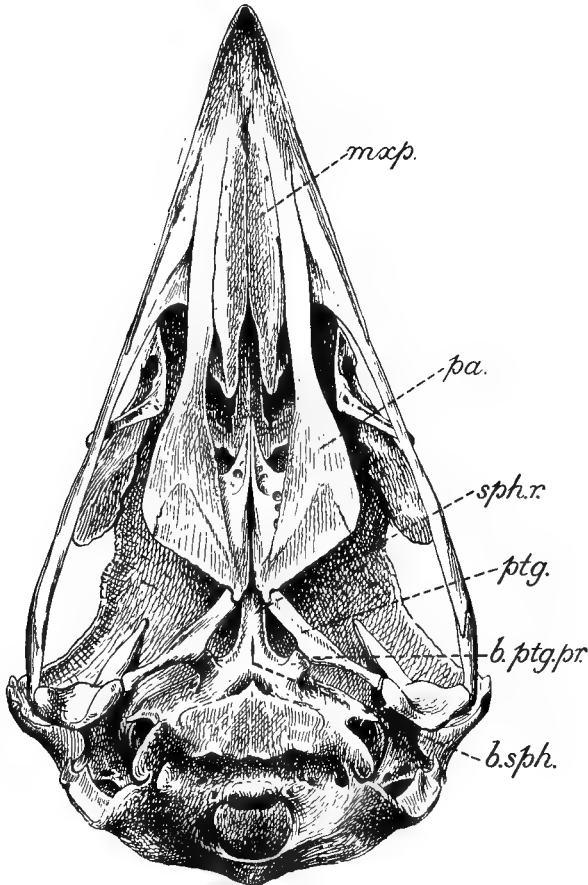


FIG. 5.—Base of the skull of *Serpentarius secretarius*, showing the desmognathous arrangement of the palate bones, the maxillo-palatines being coalesced across the middle line: *maxp.*, maxillo-palatines; *pa.*, palatine; *sph.r.*, sphenoidal rostrum; *ptg.*, pterygoid; *b.ptg.pr.*, basi-ptyergoid process of the basi-sphenoid; *b.sph.*, basi-sphenoid.

V.—Huxley first pointed out the value of the arrangement of bones of the palate as an important character in classification. He distinguished four types of modifications as follows:—

(a) *Aegithognathous*.—Maxillo-palatines not coalesced with each other across the middle line of the palate; vomer broad and truncated in front (fig. 3, p. 3).

(b) *Schizognathous*.—Maxillo-palatines not coalesced with each other across the middle line of the palate; vomer narrow and more or less pointed in front (fig. 4, p. 4).

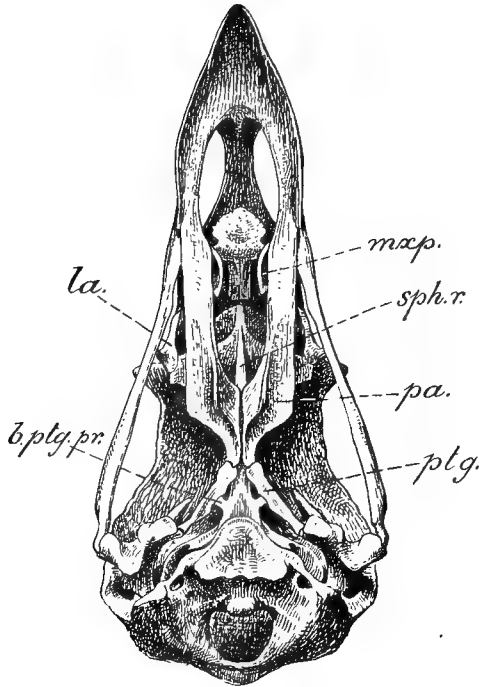


FIG. 6.—Base of the skull of *Cathartes aura*, showing the second type of desmognathous arrangement of the palate bones, the maxillo-palatines being united below the ossified nasal septum: *max.p.*, maxillo-palatines; *la.*, lacrymal; *sph.r.* sphenoidal rostrum; *pa.*, palatine; *b.ptg.pr.*, basi-ptyergoid process of the basi-sphenoid; *ptg.*, pterygoid.

(c) *Desmognathous*.—Maxillo-palatines either coalesced across the middle line or united by an ossified nasal septum; vomer often absent (figs. 5 and 6, pp. 5, 6).

(d) *Dromæognathous*.—Vomer expanded behind so as to prevent the palatines from articulating with the rostrum of the basi-sphenoid (fig. 7, p. 7).

VI.—The presence or absence of the basi-ptyergoid processes on

the basi-sphenoid or upon its rostrum, which articulates with facets on the pterygoids, is a character of considerable value in the diagnosis of certain groups of birds (fig. 5, p. 5).

VII.—Mr. Garrod laid great stress on the presence or absence of five muscles in the thigh of birds; although subsequent research

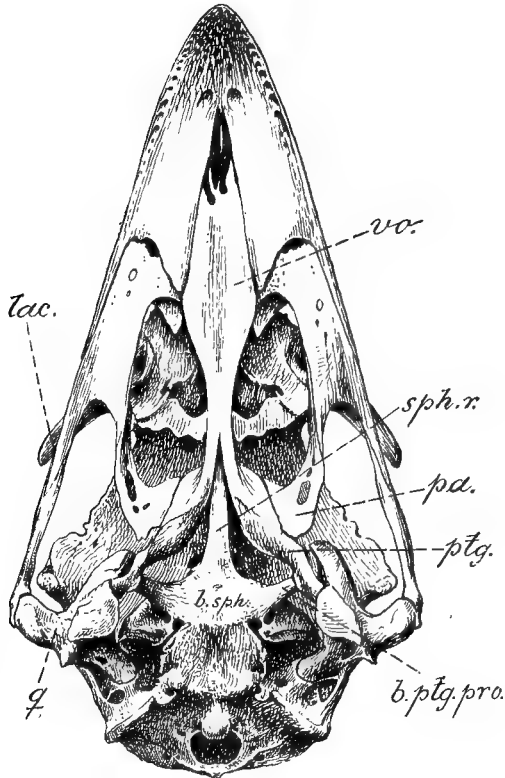


FIG. 7.—Base of the skull of *Dromæus*, showing the dromæognathous arrangement of the palate bones: *vo*, vomer; *lac*, lacrymal; *sph.r.*, sphenoidal rostrum; *pa*, palatine; *ptg*, pterygoid; *b.sph*, basi-sphenoid; *q*, quadrate; *b.ptg.pro*, basi-ptyergoid process of the basi-sphenoid.

has shown that this character is not one of primary value, yet it is still a useful one.

These muscles are the ambiens, femoro-caudal, accessory femoro-caudal, semitendinosus and accessory semitendinosus.

Key of the Families.

(In this key, which is intended only for the easy recognition of the position of any particular unknown bird, only the external and easily recognisable characters are used. For the full anatomical details recourse must be had to the descriptions of each family.)

- A. Feet with three toes forwardly, the first or hallux backwardly directed.
- a. The third and fourth toes united along their basal joint at least (syndactylous).
- a¹. With ten tail-feathers.
- a². Under wing-coverts normal; tarsus scutellated posteriorly.
- a³. Head crested *Upupidæ*, p. 9.
- b². Head without crest *Irrisoridæ*, p. 13.
- b². Under wing-coverts not covering the quills below; posterior aspect of tarsus covered with small scales *Bucerotidæ*, p. 100.
- b¹. With twelve tail-feathers.
- a². Bill long, slender and curved; ten primaries *Meropidæ*, p. 55.
- b². Bill long, but stout and straight; eleven primaries *Alcedinidæ*, p. 71.
- b. The third and fourth toes only united by a slight web not extending as far as the first joint; claw of the middle toe pectinated *Caprimulgidæ*, p. 31.
- c. The third and fourth toes quite free from one another; fourth toe reversible at will.
- a¹. With twelve tail-feathers *Coraciidæ*, p. 45.
- b¹. With ten tail-feathers *Musophagidæ*, p. 212.
- B. Feet with all four toes forwardly directed (pamprodactylous).
- a. Bill very small with wide gape; secondaries very short and less than nine in number *Cypselidæ*, p. 19.
- b. Bill short and finch-like; secondaries normal, more than nine in number *Coliidæ*, p. 93.
- C. Feet with third and fourth toes forwardly, first and second backwardly directed (heterodactylous)..... *Trogonidæ*, p. 120.
- D. Feet with second and third forwardly, first and fourth backwardly directed (zygodactylous).

- α. With twelve tail-feathers.
 *a*¹. Ten primaries, the first short about
 half length of wing..... *Picidæ*, p. 124.
 *b*¹. Nine primaries, the first nearly as
 long as the following ones..... *Indicatoridæ* (except *Proto-*
 discus), p. 144.
- β. With ten tail-feathers.
 *a*¹. With ten primaries.
 *a*². Rictal and chin bristles well
 developed..... *Capitonidæ*, p. 156.
 *b*². Rictal and chin bristles not con-
 spicuous *Cuculidæ*, p. 172.
- b*¹. With nine primaries, the first as
 long as the succeeding ones *Protodiscus* (*Indicatoridæ*),
 p. 155.

Suborder I. UPUPÆ.

Toes somewhat syndactyle; deep plantar tendons not free from one another as generally stated, but a slip of the posterior tendon, *i.e.*, the *flexor longus hallucis*, joins the branch of the *flexor perforans digitorum* which supplies the third toe, so that while the fourth and second toes are supplied by the *flexor perforans digitorum* alone and the first toe by the *flexor longus hallucis*, the third toe is supplied by a twig from both tendons (fig. 2*f*, p. 2); palate desmognathous; dorsal feather-tract defined on the neck, forked on the upper neck (fig. 1, p. 2); oil gland tufted; cæca absent; no ambiens or femoro-caudal muscles.

Family I. UPUPIDÆ.

This family contains only a single genus, the characters of which are given below.

Genus I. UPUPA.

Type.

Upupa, *Linn. Syst. Nat.* 12th ed. i, p. 183 (1766)U. epops.

Bill long and slender, curved from the base to the tip; tongue very short; nostrils rounded and widely open, placed nearer the culmen than the edge of the mandible; head crested; wings rounded

with ten primaries, the first about half the length of the second, the third, fourth and fifth the longest; tail square, of ten feathers, shorter than the wings; tarsus short, scutillated behind as in the larks; plumage dull, without metallic gloss.

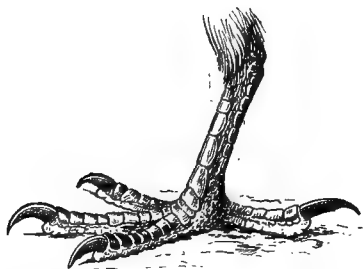


FIG. 8.—Foot of *Upupa africana*. $\times \frac{1}{7}$.

The Hoopoes form a well-marked family and genus, containing some five species distributed over Europe, Asia, and Africa; only one species comes within our limits.

382. *Upupa africana*. *South African Hoopoe*.

Upupa africana, *Bechst. Kurze Uebers.* iv, p. 172 (1811); *Sharpe, ed. Layard's B. S. Afr.* pp. 134, 808 (1875-84); *Barratt, Ibis*, 1876, p. 198; *Ayres, Ibis*, 1879, p. 294 [Rustenburg]; *Butler, Feilden, and Reid, Zool.* 1882, p. 207; *Holub & Pelzeln, Orn. Süd-Afr.* p. 70 (1882); *Symonds, Ibis*, 1887, p. 328; *Salvin, Cat. B. M.* xvi, p. 14 (1892); *Shelley, B. Afr.* i, p. 112 (1896); *Rendall, Ibis*, 1896, p. 167 [Barberton]; *Sowerby, Ibis*, 1898, p. 571 [Ft. Chiquaqua]; *Woodward Bros. Natal B.* p. 81 (1899); *Alexander, Ibis*, 1900, p. 99 [Zambesi]; *Marshall, Ibis*, 1900, p. 244 [Salisbury]; *Ivy, Ibis*, 1901, p. 20.

Upupa minor, *Shaw, Genl. Zool.* viii, p. 139 (1812); *Jardine and Selby, Ill. Orn.* pl. 142 (1839); *Gurney, Ibis*, 1865, p. 265 [Natal]; *Layard, B. S. Afr.* p. 72 (1867); *id. Ibis*, 1868, p. 243 [Swellendam]; *Gurney, Andersson's B. Damaraland*, p. 64 (1872).

Description. Adult male.—Head and back brick-red, the head with a long crest, the tips of the crest-feathers being black, the lower back and scapulars barred very pale brick-colour and black extending across the secondaries; quills black, the innermost

primaries and outer secondaries with white bases forming a white patch on the wing, the inner secondaries edged with pale brick, lesser, median and greater coverts with black bases and white tips; upper tail-coverts white with black tips; tail-feathers black with a steel-blue gloss, with white bases just visible below the coverts, on the outer web of the outer feather the white is a little more extensive; below, throat, breast and axillaries brick-red like the upper surface; abdomen paler with a few darker streaks; under tail-coverts white.

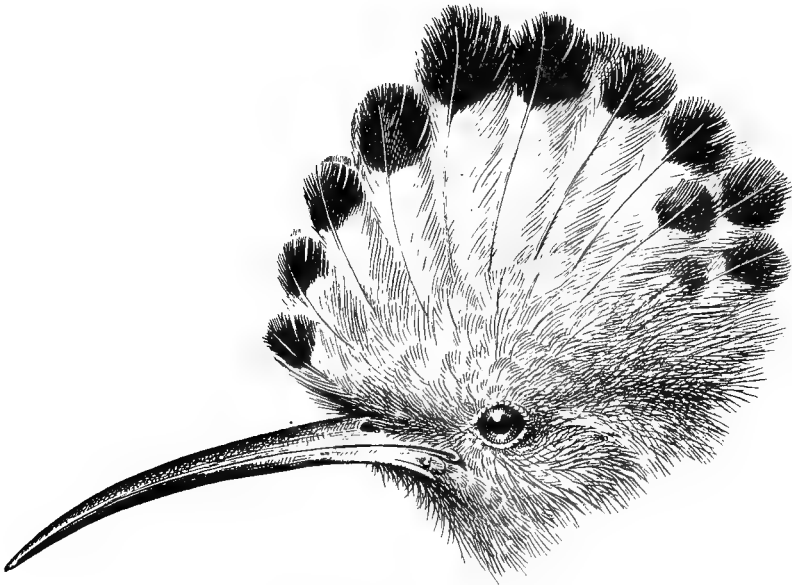


FIG. 9.—*Upupa africana*. $\times \frac{1}{4}$.

Iris and bill dark brown; legs grey-brown.

Length (in flesh) 10·5; wing 5·20; tail 3·75; tarsus ·80; culmen 2·0.

The female is like the male, but duller in colour and smaller in size, the brick-red fading into a dirty brown.

Wing 5·0; tail 3·5; culmen 1·75.

Distribution.—The South African Hoopoe is widely spread over South Africa from the neighbourhood of Cape Town where, however, it is not common, and from Durban to the Zambesi. The

following are the chief recorded localities. In Cape Colony—the Cape, Swellendam, Knysna, Port Elizabeth, East London, Beaufort West, Middelburg and Gordonia divisions; throughout Natal from Durban to Newcastle; Kroonstad and Bloemfontein in the Orange River Colony; Lydenburg, Rustenburg and Swaziland in the Transvaal; Salisbury and the higher reaches of the Zambesi in Rhodesia, Bechuanaland and Damaraland.

Beyond our limits it extends to Angola, Nyasaland and German and British east Africa.

Habits.—The South African Hoopoe is easily distinguished from the well-known European bird by its completely black primary quills, those in the more familiar species are crossed by a band of white. Generally solitary or in pairs, it is sometimes seen in small flocks, especially about the time of migration. A favourite haunt is among the mimosa trees which line the banks of so many South African rivers; here it can be heard sometimes with its well-known cry of “hoop hoop” or “poup poup,” from which it derives its trivial name. When at rest the high crest is usually recumbent, but when excited it keeps on raising and lowering it. The Hoopoe feeds chiefly on insects such as grasshoppers and beetles and their grubs, in search of which it probes the damp ground with its long bill and scrutinises the crevices of rocks and trees. It is stated to be a very shy bird and difficult to approach. The South African Hoopoe appears to be migratory to a certain extent. Mr. Andersson stated that in Damaraland it is found only in the rainy season, *i.e.* (October to March) arriving in small flocks, which, however, soon disperse. In Mashonaland, too, Mr. Marshall states that they are found in small flocks in early spring, and finally Mr. Atmore notices that Hoopoes were to be found near Meiring’s Poort (in the Oudtshoorn division of the Colony) between June and January only; at present, however, it is not possible to give an exact account of their wanderings.

Mr. L. Layard found this bird breeding at Grootevaders Bosch in the Swellendam division; no nest was made but the eggs were laid on the mud used for cementing the stones of a rough wall. As in the case of the European bird the nest, or rather the place where the eggs were laid, was exceedingly foul and evil-smelling. Mr. Ivy informs me that these birds breed between October and January in the neighbourhood of Grahamstown, choosing a hollow tree or an ant heap in which to deposit their eggs, which are four to five in number. The eggs are very pale

blue ovals, marked throughout with very fine indistinct pale brown mottlings, measuring 1.05×0.72 . Mr. Millar, who has observed this bird nesting near Durban, states that when the eggs are first laid they are pale blue in colour, but that in two or three days they turn to a dirty white, which is certainly the colour of eggs preserved in collections.

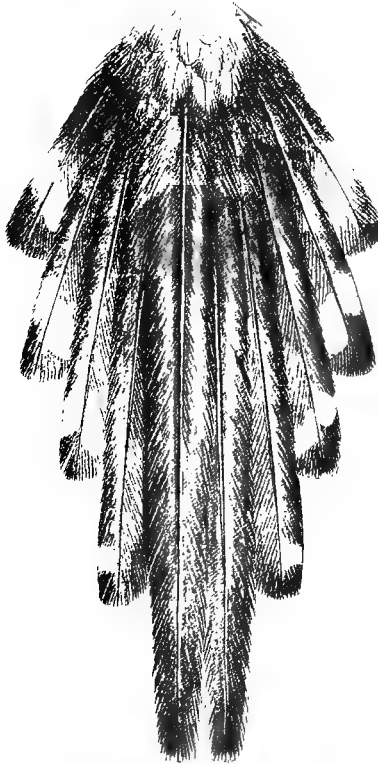


FIG. 10.—Tail of *Irrisor viridis*.

Family II. IRRISORIDÆ.

Bill long, slender, and curved from base to tip; tongue short; nostrils elongated, with overhanging ledge, or operculum, half concealing the opening; no crest; wings rounded, with ten primaries; tail of ten feathers, wedge-shaped and much graduated, the central

feathers being a good deal longer than the wing; tarsus as in the *Upupidæ*, short and scaled posteriorly.

The members of this small family are all confined to the Ethiopian Region

Key of the Genera.

- a.* Bill slightly curved, upper edge of nostril thickened *Irrisor*, p. 14.
b. Bill strongly curved, upper edge of the nostril with
 a horny membrane *Rhinopomastus*, p. 17.

Genus I. **IRRISOR**.*

Type.

Irrisor, *Less. Traité d'Orn.* p. 239 (1831) *I. viridis*.

Bill moderately arched; nostrils open and slit-shaped, overhung by a thickened cave-like edge. Other characters as recorded above in the family diagnosis.

This genus, which is confined to Africa, contains four species, only one of which is found within our limits.

383. **Irrisor viridis.** *Kakelaar.*

Upupa viridis, *A. A. H. Lichtenstein, Cat. rer. Nat. Hamb.* p. 22 (1793).

Promerops moqueur, *Levaill. Hist. Nat. Promerops*, p. 8, pls. 1, 2, 3 (1807).

Falcinellus erythrorhynchus (*nec Lath.*) *Vieill. N. Dict. H. N.* xviii, p. 163 (1819).

Irrisor erythrorhynchus, *Grill, K. Vet. Akad. Handl. Stockholm*, ii, no. 10, p. 40 (1858) [Knysna]; *Gurney, Ibis*, 1862, p. 27 [Natal];

* Mr. Ogilvie Grant has recently proposed to rearrange the species of this genus (*Bull. B. O. C.* xii, p. 36, 1901). He recognises three species in South Africa—*I. erythrorhynchus* found in west and north-east Africa, and extending to Natal: *I. viridis* also in Natal and the Colony: *I. damarensis* from Damaraland. They are distinguished by him as follows:—

a. Back metallic green.

*a*¹. Tail longer, 9 to 10 ins; white spot on the quills, 0·9 to 1·1 in width *I. erythrorhynchus*.

*b*¹. Tail shorter, 7 to 8 ins; white spot on the quills, about 0·5 in width *I. viridis*.

b. Back sooty-black, with a purplish-bronze gloss ... *I. damarensis*.

Layard, B. S. Afr. p. 72 (1867); *id. Ibis*, 1869, p. 364; *Gurney in Andersson's B. Damaraland*, p. 65 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 187, 808 (1875-84); *Ayres, Ibis*, 1879, p. 294 [Rustenburg]; *Holub & Pelz. Orn. Süd-Afrikas*, p. 71 (1882); *Shelley, Ibis*, 1882, p. 245 [Umfuli river]; *W. Ayres, Ibis*, 1887, p. 51 [Rovi Rand]. *Irrisor viridis*, *Salvin, Cat. B. M.* xvi, p. 17 (1892); *Shelley, B. Afr.* i, p. 112 (1896); *Sowerby, Ibis*, 1898, p. 570 [Fort Chiquaquua]; *Woodward Bros. Natal Birds*, p. 82 (1899); *Alexander, Ibis*, 1900, p. 99 [Zambesi river]; *Marshall, ibid.* p. 244 [Mashonaland]; *Ivy, Ibis*, 1901, p. 20.

"Kakelaar" (*i.e.*, Chatterer) of Dutch; "Hlebabafazi" of Natal Zulus (Woodward); "Inshlaza" of Matabele (Ayres).

Description. Adult male.—Head, neck, upper back and scapulars glossy steel-green; lower back, rump and upper tail-coverts dark blue, with traces of gloss only on the upper tail-coverts; wings

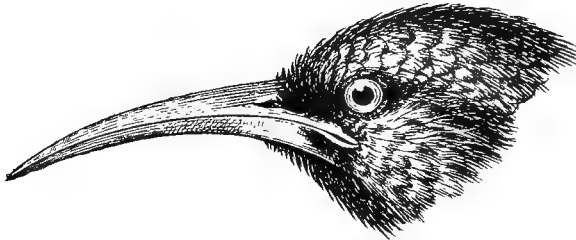


FIG. 11.—*Irrisor viridis*, ♂. $\times \frac{1}{4}$.

steel-blue, a white spot on the inner webs of all the primaries, some of the greater coverts tipped with white, some of the median and lesser coverts tipped with coppery-red; tail-feathers very strongly graduated, the two centre feathers steel-blue throughout, the next pair with a white spot on the outer web only, the others with white spots on both webs (fig. 10, p. 13); below, the throat and neck steel-blue, the breast and underside of the quills steel-green, the abdomen, flanks and under tail-coverts blue-black without steely gloss.

Bill red; iris very dark brown; legs and feet red.

Length about 13.0; wing 5.30; tail 6.30 to 9.00; tarsus 1.05; culmen 2.25.

The adult female resembles the male but has a shorter and straighter bill; culmen about 1.75.

The young bird has a black bill and the head and back with a purple, coppery gloss, while the lower surface is black with hardly

any gloss at all; the distal half of the greater coverts are also entirely white and form a much more prominent alar speculum than in the adult; the culmen is also shorter; in the case of a male nestling it measured 1.15, as against 2.2 in the adult.

Distribution.—The Kakelaar is found only in the southern and eastern districts of the Colony from Knysna onwards to Stockenstroom, Grahamstown and the Transkei. It seems fairly abundant throughout Natal, the Transvaal, Mashonaland, Bechuanaland, and Damaraland in suitable localities. The following are the chief recorded localities in Cape Colony—Knysna, Port Elizabeth, Alexandria, Albany, Stockenstroom, Peddie, East London and Port St. John's; in Natal—Durban, Pinetown, Newcastle, and Zululand; in the Transvaal—Swaziland, Lydenburg, Rustenburg and Potchefstroom; in Rhodesia—Tati, Umfuli river and Zambesi valley. Beyond South African limits this hoopoe extends to Angola on the west and to Nyasaland, German and British east Africa.

Habits.—The Kakelaar is only found in forest and bush districts; here in small parties of four to eight birds they are not uncommon, chiefly frequenting the highest trees, unceasingly hunting the crevices of the bark for insects, especially cockroaches, which form their favourite food; they creep about like Woodpeckers, and thus frequently wear away their tails against the rough bark. All observers are agreed that their loud and harsh-resounding chattering, which is constantly maintained, is very tiresome and disagreeable. The birds are restless, shy, and extremely wary, and also are endowed with an exceedingly disagreeable odour which proceeds from the bodies of the birds themselves, and is specially noticeable during the breeding season. Mr. Ivy informs me that in the neighbourhood of Grahamstown he has found the Kakelaar occupying the deserted nest of a Woodpecker in a Yellow-wood tree (*Podocarpus*), and that three blue eggs are laid. This is further confirmed by Mr. Millar, who writes as follows:—“This bird is generally distributed throughout Natal, and may be found in small family parties, their presence being indicated by a constant chattering. Towards the end of September, 1899, I observed a small party of three inspecting the entrance of a recently constructed Black-collared Barbet's (*Lybius torquatus*) nest, about 20 feet from the ground. Upon taking possession and peering into the hole, it was evidently decided that the entrance was too small, in consequence of which first one and then another started pecking away with the object of enlarging it; this led me to think the birds

had determined to oust the Barbet and commandeer the premises for themselves. During the next three weeks I paid several visits, but was not satisfied that incubation had commenced. On October 22 I carefully approached the nest; the cock bird was on sentry and, as soon as I showed myself, flew off with chattering, warning the hen who popped her head out of the hole to ascertain the cause; being unable, however, to see me she disappeared. After waiting some little time I climbed the tree and started cutting away the nest with an axe, but it was not until striking several blows that the hen flew out of the nest, which I found to contain two elongate eggs of a beautiful verditer, measuring 1.0×0.6 .

“The clutch presumably consists only of two eggs as they were slightly incubated, and instead of being pure white and round, as stated by Sharpe and Layard, they are verditer and distinctly elongate. The nest was not lined in any way.

“Collectors might easily be mistaken in the identification of eggs, unless very careful, when taking them from holes in trees; I have frequently noticed holes that are constructed by one species of bird, yet laid in by another, and even occasionally by both birds at one and the same time.”

Genus II. RHINOPOMASTUS.

Type.

Rhinopomastus, *Smith, Zool. Journ.* iv, p. 2 (1828) *R. cyanomelas*.

Bill very slender and much curved; nostrils elongated and completely overhung by a horny membrane or operculum. Other characters as recorded above in the family diagnosis. This genus, containing three species, is confined to southern, central, and east Africa. Only one species is found in South Africa.

384. **Rhinopomastus cyanomelas.** *Scimitar-bill.*

Le Promerops namaquois, *Temm. Cat. Syst. du Cabinet d'Orn.* pp. 74, 217 (1807); *Levaill. Hist. Nat. Prom.* pls. 5, 6 (1807).

Falcinellus cyanomelas, *Vieill. N. Dict. d'Hist. Nat.* xxviii, p. 165 (1819).

Upupa purpurea, *Burchell, Travels*, i, p. 326 (1822).

Rhinopomastus smithii, *Jardine, Zool. Journ.* iv, p. 1, pl. 1 (1828).

Rhinopomastus cyanomelas, *Sharpe, ed. Layard's B. S. Afr.* pp. 138, 809 (1875-84); *Barratt, Ibis*, 1876, p. 199 [Marico]; *Butler, Feilden, and Reid, Zool.* 1882, p. 207 [Ladysmith]; *W. Ayres, Ibis*, 1887,

p. 52 [Rovi Rand]; *Symonds, Ibis*, 1887, p. 328 [Kroonstad]; *Salvin, Cat. B. M.* xvi, p. 24 (1892); *Shelley, B. Afr.* i, p. 113 (1896); *Sowerby, Ibis*, 1898, p. 570 [Ft. Chiquaqua]; *Woodward Bros. Natal Birds*, p. 82 (1899); *Alexander, Ibis*, 1900, p. 100 [Zambesi]; *Marshall, Ibis*, p. 245 [Salisbury].

Irrisor cyanomelas, *Layard, B. S. Afr.* p. 73 (1867); *Gurney, Andersson's B. Damaraland*, p. 67 (1872); *Buckley, Ibis*, 1874, p. 366 [Bamangwato]; *Holub & Pelz. Orn. Süd-Afrikas*, p. 71 (1882).

Description. *Adult male.*—Crown and back glossy purple, wings of a bluer shade; across the primaries a white bar, always on the inner web, usually on the outer web also of the inner primaries, some of the inner greater coverts with white tips; tail indigo blue, strongly graduated, the outer two pairs of rectrices with white spots at the tip of the feather; below black throughout with hardly any metallic gloss.

Iris brown; bill and legs almost black.

Total length about 10·5; wing 4·4; tail 5·1; culmen 1·90; tarsus 0·70.

Female similar to the male but with the tips of the primaries somewhat greyer and the throat somewhat browner.

Young like the female but with the throat and chest quite brown.

The amount of white on the wings and tail varies considerably with different individuals. A male from near Upington on the Orange river in the South African Museum has no white on the tail and wing-coverts at all.

Distribution.—This bird only comes just as far south as the Orange River Valley and is therefore not found in the greater part of the Colony. It is rare in Natal but commoner in Zululand, and from there is found throughout the country to the Zambesi.

The following are the chief recorded localities: In Cape Colony—Colesberg, Griqualand West (whence came Burchell's type of *U. purpurea*), Upington on the Orange river, and Kuruman; Natal—Ladysmith and Eshowe; Orange River Colony—Kroonstad; Transvaal—the Marico and Lydenburg districts; Bechuanaland—Kanye and Lake Ngami; Rhodesia—Tati, Fort Chiquaqua and Zambesi; Great Namaqualand and Damaraland to the Okavango.

Beyond our limits the Scimitar-bill has been obtained in Angola, Nyasaland and East Africa as far north as Kilimanjaro and Lamu.

Habits.—This bird seems to be somewhat a rare one throughout South Africa and has not attracted very much notice; it is found

usually singly or in pairs and not in small parties like the Kakelaar, frequenting forest as well as thorn country, where it runs up and down the trunks and branches of the mimosas, somewhat like a Tree Creeper in search of insects and their larvæ which form its food. Marshall states that it not infrequently descends to the ground in pursuit of its prey and that the stomachs of individuals examined by him contained diptera, reduviid bugs and occasionally cteniform spiders and wasps; while Ayres obtained a female which was regaling itself on white ants as they were ascending the tree trunk. Like a tit it will creep head forwards down a perpendicular tree trunk, and will also cling beneath a branch examining flower-buds for insects. Its flight is more graceful and floating than that of its ally the Kakelaar; and though most authors state that it is a silent bird, the Woodwards speak of it as noisy and chattering, and that it has a peculiar plaintive cooing note which can be heard at a great distance off and to which it sometimes gives utterance when perched on the top of a tree.

Mr. Millar tells me that he once found the young of this bird in the hole of a tree where they had evidently nested; but that he had never been able to find the eggs, probably in consequence of the wary nature of the bird. I know of no other observations on their nesting habits.

Suborder II. CYPSELI.

Deep plantar tendons coraciine, *i.e.*, hallux supplied by the flexor perforans digitorum; palate ægithognathous or desmognathous; dorsal feather tract defined on the neck forked on the upper back; oil gland naked; ambiens muscle absent.

This suborder in addition to the Swifts and Goatsuckers includes a third family, the Humming birds (*Trochilidae*) confined to the New World; perhaps also the Frogmouths (*Podargidae*) from the Oriental and Australian regions, and the Oil-bird forming the family *Steatornithidae* from South America.

Family I. CYPSELIDÆ.

Bill small and slightly hooked, gape very broad, wings long, the primaries ten in number being greatly developed and curved; secondaries very short and less than nine in number; humerus

very short; feet weak, small and usually pamprodactylous (*i.e.*, all four toes anteriorly directed); tail of ten feathers only (this latter character an easily recognisable distinction from the Swallows with a tail always of twelve feathers); palate ægithognathous, no

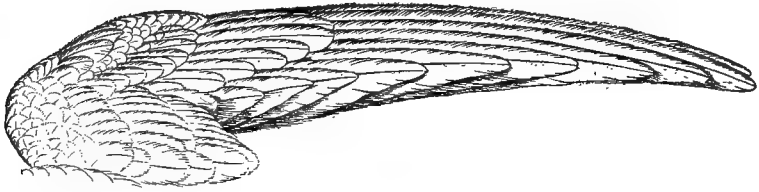


FIG. 12.—Wing of *Cypselus africanus*. $\times \frac{1}{2}$.



FIG. 13.—Foot of *Cypselus africanus*. $\times \frac{1}{4}$.

cæcan or semitendinosus muscle. The Swifts are all birds of strong flight and lay elongated white eggs in nests which are partly or wholly composed of the inspissated secretion of the salivary glands.

The range of the family extends all over the world except the extreme northern and southern regions.

Key of the Genera.

- A. Tarsus feathered; tail normal.
- a. All the toes directed forward at equal intervals *Cypselus*, p. 21.
 - b. Toes in pairs, the third and fourth outwards, the first and second inwards *Tachornis*, p. 28.
- B. Tarsus unfeathered; tail with the shafts stiffened and projecting as spines beyond the webs of the feathers *Chætura*, p. 29.

Genus I. **CYPSELUS.**

Type.

Cypselus, *Illig., Prodr.* p. 229 (1811) *C. apus*.

Tarsi feathered, outer and middle toes with three phalanges only; all the toes directed forwards at equal intervals from one another, though the first or inner one is reversible at will; toes unfeathered. Sexes alike.

All the Swifts are birds of sombre plumage and of very powerful flight. As a rule the nests are made against rocks or buildings and built of feathers and other materials cemented together with saliva not with mud.

This genus is distributed over the whole of the world except in the extreme north; two species are found in South America but the Swift of North America is referred to another genus. Shelley recognises fifteen African species, several of which however, rest on somewhat uncertain evidence. Five South African forms are distinguished below.

The names *Apus* and *Micropus* have been used for this genus, as having priority to *Cypselus*; but there seems to be excellently valid reasons for ignoring both of them.

Key of the Species.

- A. Larger, wing more than 6·0; back uniform.
 - a. Abdomen and throat white separated by a pectoral band..... *C. africanus*, p. 21.
 - b. Brown below, only a throat patch white.
 - a¹. Smaller, wing 6·6 to 6·7 *C. apus*, p. 23.
 - b¹. Larger, wing 7·1 *C. barbatus*, p. 25.
- B. Smaller, wing less than 6·0; rump white.
 - a. Tail deeply forked, difference between the inner and outer tail-feathers exceeding 1·0 *C. caffer*, p. 25.
 - b. Tail nearly square, the difference between the outer and inner tail-feathers hardly perceptible *C. affinis*, p. 27.

385. **Cypselus africanus.** *White-bellied Swift.*

Le Martinet à gorge blanche, *Levaillant, Ois. d'Afr.* v, p. 143, pl. 243 (1806).

Cypselus alpinus africanus, *Temm. Man. d'Orn.* p. 270 [note] (1815).

Cypselus gutturalis, *Vieill. N. Dict. H. N.* xix, p. 422 (1818); *Tristram, P. Z. S.* 1867, p. 887; *Gurney, Ibis*, 1868, p. 460 [Natal]; *Layard*,

Ibis, 1869, p. 72; *Gurney in Andersson's B. Damaraland*, p. 46 (1872).

Cypselus melba (*nec Linn.*), *Grill, K. Vet. Akad. Handl.* ii, no. 10. p. 41 (1858) [Knysna and Oudtshoorn]; *Layard, B. S. Afr.* p. 50 (1867); *Sharpe, ed. Layard's B. S. Afr.* p. 95 (1875); *Butler, Feilden, and Reid, Zoologist*, 1882, p. 206.

Micropus africanus, *Hartert, Cat. B. M.* xvi, p. 410 (1892).

Cypselus africanus, *Shelley, B. Afr.* i, p. 105 (1896).

Apus africanus, *Hartert, Tierreich Podarg.* p. 84 (1896).

Description.—General colour above, mouse-brown, a little darker on the wings and tail, lores nearly black; below, a white patch on the throat and abdomen separated by a brown pectoral band; sides of the body, under tail- and wing-coverts brown like the back. In some specimens the white feathers of the throat and abdomen have dark shaft lines.

Iris dark brown; bill black; legs and feet brown.



FIG. 14.—*Cypselus africanus*. $\times \frac{1}{4}$.

Length (in flesh) 8·0; wing 8·10; tail 3·40; culmen 0·40; tarsus 0·50.

The sexes are alike; the young birds have white edges to most of the brown feathers which gradually disappear.

This bird is very closely allied to the Alpine Swift, from which it is stated to differ in its slightly smaller size (wing 8·1 against 8·45), its broader brown collar and its browner flanks.

It will perhaps be best considered as a sub-species of the European bird.

Distribution.—The White-bellied Swift is found all over south and east Africa in mountainous districts, extending as far north as Kilimanjaro, and perhaps into Shoa.

In the Colony it is abundant, especially in Cape Town and on Table Mountain, where it arrives about August and stays till after Christmas; it is also recorded from the Paarl in January, from Swellendam, Knysna in May (Victorin), Port Elizabeth and East

London, and from near Upington on the Orange river in August; Reid describes it as visiting the north-west portion of Natal in considerable numbers, arriving there early in September, he also specially notes it from near Maritzburg in April and August.

There is a specimen in the Pretoria museum shot close to that town in January, and in Damaraland Andersson obtained it at Otjimbingue in July and at Omaruru in November.

Beyond our limits this species is recorded from Kilimanjaro and Shoa in southern Abyssinia.

Habits.—The White-bellied Swift, even more than others of the same group, is a bird of very rapid flight and is seldom seen except in the immediate neighbourhood of mountains, where it probably returns not only to breed but also to roost. Like other Swifts its food consists entirely of insects, such as flies and beetles. Mr. Layard specially notices the fact that it has no note, if this is the case it shows a marked distinction from the Alpine Swift, the voice of which is stated to be louder than that of the smaller Common Swift. The evidence points to its breeding in South Africa, but is by no means perfect; Levillant originally stated that it built a nest among the rocks and laid four white eggs.

Reid shot a female on the Incandu river in Natal on November 4, which contained enlarged eggs and appeared about to lay, while Dr. Stark in his diary, notes on November 1: "Alpine and Common Swifts apparently breeding in the cracks of Bushman's Caves;" these are situated on the Bushman's River pass between Basutoland and Natal 6,800 feet above the sea.

Alpine Swifts are found in Central Europe only in summer, from April to September, when they breed; during the northern winter they retire to the South. If the South African birds are those which have come from Europe, it seems unlikely that they would again breed in November in South Africa; the probability therefore is that the European and South African birds are distinct races, the former spending the northern summer in Europe and visiting (October to March) Central Africa, the latter spending the southern summer in South Africa, and visiting (from April to August) also Central Africa.

386. **Cypselus apus.** *European Swift.*

Hirundo apus, *Linn. Syst. Nat.* i, p. 344 (1766).

Cypselus apus (in part), *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 41 (1858) [Knysna]; *Gurney, Ibis*, 1863, p. 321; *Layard, B. S. Afr.* p. 50 (1867); *Sharpe, ed. Layard's B. S. Afr.* p. 90 (1875); *Ayres*,

Ibis, 1878, p. 407, 1880, p. 260 [Potchefstroom]; *Butler, Feilden, and Reid, Zool.* 1882, p. 205; *Shelley, Ibis*, 1882, p. 242 [Mashonaland and Bechuanaland]; *Shelley, B. Afr.* i, p. 105; *Woodward Bros. Natal B.* p. 83 (1899); *Marshall, Ibis*, 1900, p. 245 [Mashonaland].
Micropus apus, Hartert, Cat. B. M. xvi, p. 442 (1892).
Apus apus, Hartert, Tierreich, Podarg. p. 85 (1897).

Description. Adult.—General colour above and below, brownish-black with a slight greenish gloss, especially in adult and newly killed examples; crown a little paler; chin and throat white, sometimes with slight indications of black shaft stripes; under wing- and tail-coverts with slight indications of white edges to the feathers.

Iris dark brown; bill and legs black.

Length about 7·0; wing 6·6 to 6·7; tail 3·20; tarsus ·35; culmen 0·27.

The young birds have white edges to most of the feathers and a whiter forehead.

Distribution.—The European Swift is apparently found throughout South Africa during the southern summer months, arriving about August and leaving in April. It has been constantly confused with *Cypselus barbatus*, a closely allied but resident species, so that it is difficult to give any details regarding its distribution. The Swifts so common in Cape Town and the neighbourhood about which Layard has written, appear to be the resident Cape form, although not remaining in Cape Town throughout the year, and the only example referable to this species in the South African museum is one from the Orange river in the neighbourhood of Upington, while in the British Museum Catalogue a specimen is recorded from Matabeleland.

The Common Swift is found throughout Europe and western Asia during the breeding season, and spends the winter in Africa and Madagascar.

Habits.—Little has been noted about the habits of the Common Swift in South Africa, probably in this respect it does not differ from its close ally *C. barbatus* except that it does not breed in this country. In England it selects holes under the eaves of cottages, church towers, crevices in sea cliffs, and quarries, as sites for building in; the nest is made of a few bits of straw and grass glued together by a viscous secretion formed by the bird itself. It also frequently appropriates the dwellings of other birds such as martins and house sparrows.

Two eggs, oval in shape, rough in texture, and dead-white in colour, are usually laid. Insects taken on the wing form the food of this bird, and the indigestible portions are rejected in the form of pellets.

387. **Cypselus barbatus.** *Black Swift.*

Cypselus barbatus, *P. L. Sclater, P. Z. S.* 1865, p. 599; *Tristram, P. Z. S.* 1867, p. 887; *Finsch, Trans. Zool. Soc.* vii, p. 214 (1870); *Gurney, in Andersson's B. Damaraland*, p. 47 (1872); *Shelley, B. Afr.* i, p. 105 (1896).

Micropus barbatus, *Hartert, Cat. B. M.* xvi, p. 447 (1892).

Apus barbatus, *Hartert, Tierreich, Podarg.* p. 86 (1897).

(Many of the references to the preceding species probably partly or entirely refer to this present one).

Description. Adult.—Closely resembling *C. apus*, but distinguished by its somewhat larger size, its somewhat darker colour, and by the very conspicuous and well developed shaft lines on its somewhat dusky-white throat-patch. As a rule the feathers of the flanks and abdomen retain the white edgings found only in the young birds of the other allied species.

Iris, bill, and legs black.

Length about 7·5; wing 7·1; tail 3·0; tarsus 0·40; culmen 0·30.

Distribution.—This bird, though very closely resembling the European species, appears to be resident in South Africa. It is certainly the bird alluded to by Layard as being found round about Cape Town between August and April, as is shown by examples in the South African Museum. It appears, too, from the statements of Ayres and Reid, that a brown Swift is found all the year round in Natal; this is probably the present species, though it is quite possible that the European form may also co-exist with it.*

Habits.—Captain Reid believes that this species breeds in the crevices of the rocky ravines near Newcastle, but he does not appear to have actually found the nests or eggs. In other respects this species does not differ from the European one.

388. **Cypselus caffer.** *African White-rumped Swift.*

Martinet à croupion blanc, *Levaill. Ois. d'Afr.* v, p. 146, pl. 244, fig. 1 (1806).

Cypselus caffer, *Licht. Verz. Doubl.* p. 58 (1823); *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 41 (1858) [Knysna and Oudtshoorn];

* An example from Port St. John in Pondoland, shot in January, has recently been sent to the South African Museum.

P. L. Selater, *P. Z. S.* 1865, p. 600; *Gurney, Ibis*, 1865, p. 264 [Maritzburg]; *Layard, B. Afr.* p. 51 (1867); *Gurney, Ibis*, 1868, pp. 50, 152 [Potchefstroom]; *Shelley, Ibis*, 1875, p. 67 [Pinetown]; *Sharpe, ed. Layard's B. S. Afr.* p. 92 (1875); *Shelley, Ibis*, 1882, p. 242 [Umfuli R.]; *Butler, Feilden, and Reid, Zool.* 1882, p. 206 [Newcastle]; *Ayres, Ibis*, 1884, p. 222 [Potchefstroom]; *Shelley, B. Afr.* i, p. 105 (1896).

Micropus caffer, *Hartert, Cat. B. M.* xvi, p. 450 (1892).

Apus caffer typicus, *Hartert, Tierreich, Podarg.* p. 87 (1897).

Description. *Adult.*—Above, head, wings, and tail ashy-black, some of the inner coverts and scapulars edged with almost pure white; centre of the back, upper tail-coverts and below, black with a purplish-metallic gloss; rump, chin, and throat white; tail much forked, the lateral rectrices elongated and attenuated.

Iris and bill black; feet dusky.

Length about 6·5; wing 5·70; tail, central feathers 1·80, lateral feathers 3·25; culmen 0·25; tarsus 0·35.

Distribution.—This little Swift is found plentifully all over the Colony, Natal, and the southern Transvaal, but appears to become rare in Mashonaland, and is not included by Anderson among the birds found in Damaraland. Beyond our limits this bird is represented by a closely-allied species, only differing in its slightly smaller size, found in the mountains of Abyssinia and the Bogos country, and apparently wintering on the Congo. South African localities are: Cape Colony—Cape Division, October to January (S. A. Mus.), Stellenbosch, September (S. A. Mus.), Caledon, October (Bt. Mus.), George (Layard), Knysna and Oudtshoorn (Victorin), Grahamstown, August (Layard), and Peddie, January (S. A. Mus.), Orange River near Aliwal North (Whitehead); Natal—Umgeni near Durban, October to February (Millar), Pinetown (Shelley), Maritzburg, December (Ayres), Newcastle, October (Butler); Transvaal—Potchefstroom (Ayres); Rhodesia—Umfuli River (Ayres).

Habits.—This little Swift appears to be a partial migrant, being observed, as a rule, only during the summer (October to March) in its best known haunts, but more observations are required to determine its exact movements. It is a tamer and more domestic bird than most of its congeners, resting about houses and showing little or no fear of man. Its flight is not so rapid as is that of the Black Swift. This bird appears to appropriate for its own use the nest of a Swallow (usually *Hirundo cucullata*) under an eave or verandah, and drives off the rightful owner; four to five eggs are

laid (Millar says only two); these are white, of an elongated and somewhat truncated shape; they measure about 1.0×0.6 .

Mr. Millar sends me the following note:—"During the summer months, from October to February, these Swifts are plentiful on the Natal coast land, and may frequently be seen stealing the nests of the smaller Stripe-breasted Swallow (*Hirundo puella*), but I have never yet noticed them building their own nests. On a cliff at Newlands on the Umgeni river, where the swallows largely congregate for nesting in October, dozens of these Swifts may be seen robbing the swallows of their nests."

389. *Cypselus affinis*. *Indian Swift*.

Cypselus affinis, *J. E. Gray and Hardwicke, Ill. Ind. Zool.* i, pl. 35, fig. 2 (1832); *P. L. Selater, P. Z. S.* 1865, p. 603; *Dresser, B. Europe*, iv, p. 591, pl. 267 (1874); *Sharpe, ed. Layard's B. Afr.* p. 94 (1875); *Shelley, B. Afr.* i, p. 105 (1896).

Micropus affinis, *Hartert, Cat. B. M.* xvi, p. 453 (1892).

Apus affinis, *Hartert, Tierreich, Podarg.* p. 87 (1897).

Description.—"Tail very even; head, wings, and tail dark brown with a slight metallic gloss; back black with steel-blue gloss; chin, throat, and a band across the wings, white.

"Iris deep brown; bill black; feet brown.

"Length 5.1 to 5.5; wing 5.0 to 5.4; lateral tail-feathers 1.6 to 1.9" (Hartert).

This is a rather variable species in both shade of colour and dimensions, but the variations do not seem to be geographical.

Distribution.—The Indian Swift has only once been obtained in South Africa. This was some years ago by Mr. H. Jackson, at Nelspoort in the Beaufort West division of the Colony. Beyond our limits it appears to be found throughout the greater part of Africa including German east Africa, Abyssinia and Senegambia, and thence through Palestine and Persia to India and Ceylon.

Habits.—Mr. Jackson found this Swift breeding in the neighbourhood of Nelspoort; the nests were composed of feathers agglutinated together, and were found in clusters fixed to rocks, and this variation from the habits of the previous species led him to think that the present bird was distinct. Mr. Blanford states that in India "this Swift is highly gregarious, and is commonly seen about old buildings and in towns. Its flight is similar to that of *C. apus*, but less powerful and its call shriller. Its nest consists of feathers, grass, or straw, cemented with saliva. Generally several

are found clustered together. It also sometimes (like *C. caffer*) lays its eggs in deserted swallow's nests. The eggs, generally three in number, are white, not glossy, long ovals, measuring 0.87×0.57 ."

Genus II. TACHORNIS.

Type.

Tachornis, *Gosse, B. Jamaica*, p. 58, pl. 9 (1847) ...*T. phœnicobia*.

The birds of this genus differ from the true Swifts in having the toes in pairs, although still all pointing forwards, the first and second form an inner pair, the third and fourth an outer; toes unfeathered, size small. The nests are always attached to the



FIG. 15.—Foot of *Tachornis parva*. $\times \frac{1}{4}$.

leaves of palms or, where palms are used for thatching, to the roofs of such huts. The genus is spread over Africa, southern Asia as far as Java and China, and the West India Islands. One species, with a race recognised as a sub-species, is found in Africa and described below.

390. **Tachornis parva.** *Palm Swift.*

Cypselus parvus, *Licht. Verz. Doubl.* p. 58 (1823); *P. L. Sclater, P. Z. S.* 1865, p. 601; *Gurney in Andersson's B. Damaraland*, p. 48 (1872); *Sharpe, ed. Layard's B. S. Afr.* p. 94 (1875).

Cypselus ambrosiacus, *Temm. Pl. Col.* 460, fig. 2 (1828).

Tachornis parva, *Hartert, Cat. B. M.* xvi, p. 463 (1892); *Shelley, B. Afr.* i, p. 107 (1896); *Hartert, Tierreich, Podarg.* p. 81 (1897); *Alexander, Ibis*, 1900, p. 93 [Zambesi River].

Description. *Adult.*—Above and below, mouse-coloured, slightly darker on the wings and tail, which have traces of greenish-metallic gloss; chin and throat paler than the rest of the under parts with darker shaft lines; tail much forked, the outer rectrices considerably produced and attenuated.

Iris dark brown; bill black; legs and feet brown.

Length about 7.0; wing 5.30; tail, central feathers 1.50, lateral feathers 3.80; culmen 0.20; tarsus 0.40.

In the young bird the throat is uniform and all the feathers especially those of the upper surface have rusty edges.

The tail varies a good deal in length.

Distribution.—The type of this species was obtained in Nubia ; it is spread over Africa to Senegambia in the west and through east Africa as far south as the Zambesi and Damaraland. A somewhat darker form separated as a sub-species (*T. gracilis*) extends over the wooded districts of west Africa and is also found in Madagascar. Within our limits the Palm Swift has been obtained at Ondonga and Ovaquenyama in Damaraland by Andersson, and on the Zambesi near Senna by Alexander.

Habits.—This Palm Swift like the other species of the genus is nearly always associated with palm trees. Alexander found a colony of them on the Zambesi ; they had taken possession of the palm trees, which grew near a village, around which they flew incessantly.

Heuglin (Orn. N. O. Afr. p. 145), gives a good account of the habits of this bird in the upper Nile valley ; he states that they build their nests in the leaf sheaths or against the folds of the downward hanging leaves of the “ Dom ” palms (*Hyphene thebaica*). The nest is composed of wool and feathers held together by a sticky secretion probably provided by the bird itself from its salivary glands. They are untidy looking objects and sway about in the wind ; the cup of the nest is not very deep and it is difficult to understand how the eggs are prevented from tumbling out. Brehm suggests that they are glued by the secretion to the nest ; the eggs are two in number, cylindrical in shape, rough in texture and of a yellowish-white colour. In their other habits they resemble other Swifts but they appear to be non-migratory birds.

Genus III. CHÆTURA.

Type.

Chætura, *Stephens, Gen. Zool.* xiii, pt. 2, p. 76 (1826) ...*C. pelagica*.

Tarsi as long as the middle toe and claw, and unfeathered ; the outer and middle toes with the normal number of phalanges ; the toes arranged as in *Cypselus* with regular intervals ; tail short and even, the shafts of the feathers strongly stiffened and projecting beyond the webs as prominent spinous points ; wings extending far beyond the tail.

The Spine-tails are widely spread from Amoor-Land throughout Asia except in the west, Australia, Tropical Africa and the whole of America ; one species just enters our limits on the Zambesi.

391. *Chætura stictilæma*. *Reichenow's Spine-tail*.

Cypselus stictilæmus, *Reichenow, Orn. Centralbl.* 1879, p. 114.

Chætura stictilæma, *Hartert, Cat. B. M.* xvi, p. 492 (1892); *Reichenow, Vög. D. Ost-Afr.* p. 142, fig. 66 (1894); *Shelley, B. Afr.* i, p. 104 (1896); *Alexander, Ibis*, 1900, p. 93 [Zambesi].

Description.—General colour dark brown, a white band across the rump above and the abdomen below, separated from one another by the dark coloured sides of the body; chin and throat dull white with dark brown edges to the feathers; primaries, secondaries and rectrices narrowly margined with white, often not very obvious when the plumage is abraded.

“Iris black; bill, legs, and feet black.

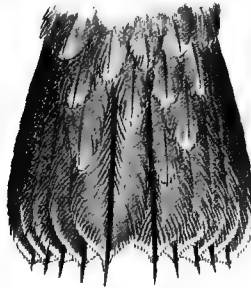


FIG. 16.—Tail of *Chætura stictilæma*.

“Length in the flesh 5·5; wing 5·7; culmen 0·3.” (Alexander.)

This bird can be at once recognised by the shafts of the tail feathers, which are very stiff and produced into perceptible prominent spinous points.

Distribution.—The type of this species was obtained at Ualimi in Useguha, a district in German east Africa, by Dr. Fischer. The bird has also been noticed near Mombasa. Recently an example has been shot by Capt. Alexander near Zumbo on the Zambesi.

Habits.—Capt. Alexander states as follows:—“Only once observed near Zumbo, on November 8, when a small party of six birds appeared and remained in the vicinity for two days, leaving again on the third day. The flight is remarkably powerful, while at the same time the rump is very conspicuous.” Mr. Blanford, speaking of the Indian species, states that he believes the Spine-tails are absolutely the swiftest of living birds; they far exceed the other Swifts in this respect. They are usually seen in small flocks and

roost and breed, so far as is known, among rocks; the eggs are white and devoid of gloss.

Family II. CAPRIMULGIDÆ.

Bill short, weak and flexible; gape very wide; nostrils tubular; wings long, the second quill usually the longest; three toes anteriorly directed, the claw of the middle toe usually pectinated on the inside; fourth or outer claw with only four phalanges; plumage soft and generally finely mottled. Palate schizognathous; skull with basipterygoid processes.

The Nightjars are spread over most of the tropical and temperate regions of the world.

Key of the Genera.

- a. None of the wing-feathers elongated; first primary shorter than the second *Caprimulgus*, p. 31.
 b. Ninth primary enormously elongated in the breeding male; first primary longer than the second..... *Cosmetornis*, p. 42.

Genus I. CAPRIMULGUS.

Type.

Caprimulgus, *Linn. Syst. Nat.* 12th ed. i, p. 346
 (1766) *C. europæus*.

A row of very strong rictal bristles along the edge of the upper mandible; no feathers of the wing or tail unduly elongated; wing long and pointed, first primary slightly shorter than the second and



FIG. 17.—Foot of *Caprimulgus europæus*.

third, which are the longest; tail slightly rounded; tarsus usually feathered to a certain extent in front; claw of the middle toe strongly toothed along the inner edge; no powder down patches.

Plumage of various shades of brown and white, with somewhat varying markings even in the same species. Sexes usually distinct, the males being characterised by white spots on the primaries and by white tips to the outer tail-feathers. This genus is spread all over the world, except in the polar regions. Twenty-one African species are recognised by Shelley, seven of which are found within our limits.

Key of the Species.

- A. Tips of the outer tail-feathers white.
- a. Outer web of the outer tail-feathers not white or pale brick.
- a¹. Scapulars obviously different from the back and rump by their dark centres and buff margins.
- a². No trace of a rufous collar on the hind neck, the three outer wing-quills only, with white spots *C. europæus*, ♂, p. 32.
- b². A distinct rufous collar on the hind neck; the four outer wing-quills with large white or pale brick spots.
- a³. Blackish above; collar very narrow *C. pectoralis*, ♂, ♀, p. 37.
- b³. Ashy-grey above; collar very narrow *C. rufigena*, ♂, p. 34.
- c³. Brown above; collar very broad, and a rich, deep rufous *C. fervidus*, ♂, ♀, p. 36.
- b¹. Scapulars not obviously different in colour from the back and rump..... *C. trimaculatus*, p. 38.
- b. Outer web of the outer tail-feathers white or pale brick.
- a¹. With a distinct collar, only the outer pair of tail-feathers with white (pale brick in ♀) *C. fossii*, p. 39.
- b¹. Without a trace of collar; two pairs of outer tail-feathers with white tips *C. natalensis*, ♂, p. 41.
- B. No white tips to the outer tail-feathers.
- a. No collar; no large distinct white spots on the wing-quills *C. europæus*, ♀, p. 32.
- b. No collar; spots on the wing-quills sandy and smaller than in the male..... *C. natalensis*, ♀, p. 41.
- c. Traces of a rufous collar; spots on the wing-quills pale and brick-coloured *C. rufigena*, ♀, p. 34.

392. **Caprimulgus europæus.** *European Nightjar.*

Caprimulgus europæus, *Linn. Syst. Nat.* 12th ed. i, p. 346 (1766); *Smith, Ill. Zool. S. Afr. Aves*, pl. 102 (1845); *Sharpe, ed. Layard's B. S. Afr.* pp. 83, 803 (1875-84); *Shelley, Ibis*, 1875, p. 67 [Durban]; *Barratt, Ibis*, 1876, p. 197 [Kroonstad]; *Ayres, Ibis*, 1876, p. 423

[Macamac] ; *Butler, Feilden, and Reid, Zool.* 1882, p. 205 [Camperdown] ; *Ayres, Ibis*, 1884, p. 222 [Rustenburg], 1886, p. 284 [Potchefstroom] ; *Hartert, Cat. B. M.* xvi, p. 526 (1892) ; *Shelley, B. Afr.* i, p. 106 (1896) ; *Hartert, Tierreich, Podarg.* p. 56 (1897) ; *Woodward Bros. Natal Birds*, p. 84 (1899).

Caprimulgus smithii, *Bp. Consp.* i, p. 59 (1850) ; *Layard, B. S. Afr.* p. 47 (1867).

Caprimulgus infuscatus (nec Cretz.), *Gurney, Ibis*, 1859, p. 242, 1868, p. 151.

“*Nacht-uil*” (*i.e.*, Night-owl) of the Dutch ; “*Isavolo*” of the Zulus (both applied to all Night-jars).

Description. Male. — General colour above ashy-brown, the feathers of the head and back vermiculated and streaked with black ; sides of the head and neck with a few scattered pale ochreous spots, but no defined collar on the nape ; scapulars like the beak. Wing-coverts with black and pale ochre mottling, wing-feathers blackish, with rufous-buff spots on both inner and outer webs, the three outer primaries with a conspicuous white spot towards the terminal half of the feather ; tail ashy-brown, with narrow, irregular black cross bars, the two outer feathers on either side white for their terminal inch at least ; chin and throat speckled yellow, white and blackish ; breast somewhat darker ; abdomen and under tail-coverts pale ochre, narrowly barred with black.

Iris dusky hazel ; bill dusky ; legs and feet dusky.

Length about 10·0 ; wing 7·25 ; tail 5·25 ; culmen 0·35 ; tarsus 0·70 ; feathered in front for about three-quarters of its length, bare behind.

The female resembles the male, but lacks the white spots on the wing and tail-feathers, and is slightly smaller.

Young birds in the first year are paler in coloration ; the males are then much like the old females, and are without the white spots on the outer rectrices, and the white on the primaries is replaced by buff.

Distribution.—This is an European bird which visits South Africa toward the northern winter from about November to March. It is widespread all over our region from Cape Town to the Limpopo, but, although probably occurring there on migration at least, has not yet been noticed in Rhodesia and Damaraland. The following are recorded localities : Cape Colony—Cape division, especially in March (*Layard*), Swellendam, Knysna in February (*Andersson*), Grahamstown, King Williams Town, and Colesberg, Port St. John, March (S.A. Mus.) ; Natal—Durban in February

(Wahlberg), Pinetown (Shelley), Camperdown, near Maritzburg, in December (Reid), Ifafa and Eshowe (Woodward); Orange River Colony—Kroonstad (Barratt); Transvaal—Potchefstroom, December to February, Rustenburg, November to February, Macamac in Lydenburg in January (Ayres), Waterberg district (Pretoria Mus.).

Outside our limits this Nightjar is found breeding throughout Europe and western Asia, passing through the whole of Africa on its southward migration.

Habits.—The Nightjar, like all its kindred, is chiefly active at night; it appears at dusk and hawks for insects, of which its food is entirely composed; it generally continues active throughout the night whether the moon is shining or not. During the day it remains hidden as a rule, though it is not averse to light and is fond of basking in the sunlight. The male utters a sharp whistle as well as a bubbling note during flight, while the vibrating churr is emitted when the bird is stationary; the note of the female is a chuck. When resting on a branch the bird sits lengthways with the head level or lower than the tail. The claw of the middle toe of all Nightjars is pectinated or comb-shaped along the inner edge (see fig. 17, p. 30); the use of this modification has not yet been determined. As already stated, this Nightjar is only a winter visitor to South Africa, and has hitherto not been known to breed here, nor is it very probable that it will be found to do so. In Europe, however, the eggs, two in number, are laid on bare ground on short moss or even on dead gorse needles among furze; they are oblong, equally rounded at each end, creamy-white, marbled and veined with brownish-black and lilac-grey.

From early times in almost all European countries this bird has been designated by some name equivalent to Goat-Sucker, which is also applied to it in England, and the fable about its sucking the teats of goats is widely spread. Some such belief is apparently prevalent even among the Zulus, as according to the Woodward's they interpret the Nightjars' weird cry as follows:—"Savolo sengela abantubako," which means "Nightjar, milk for your people."

393. *Caprimulgus rufigena*. *Rufous-cheeked Nightjar*.

Caprimulgus rufigena, *Smith, Ill. Zool. S. Afr. Aves*, pl. 100 (1845); *Ayres, Ibis*, 1869, p. 289; *Gurney in Andersson's B. Damara-land*, p. 44 (1872); *Buckley, Ibis*, 1874, p. 362 [Bamangwato]; *Sharpe, ed. Layard's B. S. Afr.* pp. 85, 803 (1875-84); *Ayres, Ibis*,

1876, p. 424 [Lydenburg], 1880, p. 259 [Potchefstroom]; *Sharpe, Oates' Matabeleland*, p. 300 (1881); *Symonds, Ibis*, 1887, p. 327 [Kroonstad]; *Hartert, Cat. B.M.* xvi, p. 532 (1892); *Shelley, B. Afr.* i, p. 106 (1896); *Sowerby, Ibis*, 1898, p. 570 (Ft. Chiquaqua); *Marshall, Ibis*, 1900, p. 245.

Caprimulgus damarensis, *Strickland, Contr. Orn.* 1852, p. 123.

Description. Male.—General colour above, ashy-grey or brown, mottled and streaked with black and pale rufous; sides of the face and ear-coverts a stronger rufous; a narrow orange-buff collar round the neck; the four outer primaries (not three as in *C. europæus*), with conspicuous white patches on the inner web in all four, on the outer web only on the inner three; tail as in *C. europæus*, with the two outer feathers broadly tipped with white; one or two white patches on the throat.

Iris dark hazel; eyelids dull chrome-yellow; bill black; legs and feet flesh-coloured; tarsus only feathered in front for about half its length.

Length about 9.5; wing 6.25 to 6.5; tail 5.25; culmen 0.4; tarsus 0.7.

The female is without white on the tail, and the spots on the wings are smaller and pale brick-coloured; the bird is also slightly smaller.

In the young male, the white spot on the fourth primary is buff and those on the first three are confined to the inner webs. The tips of the outer tail-feathers are tinged with buff.

Distribution.—This Nightjar, so far as is known, is confined to South Africa, where it is resident. It was first described by Sir A. Smith from the eastern portion of the Cape Colony, and it has been observed in all the other colonies, except Natal. The following are recorded localities: Cape Colony—Worcester (S.A.Mus.), Beaufort West, Grahamstown and Port Elizabeth (Layard); Orange River Colony—Kroonstad (Symonds); Transvaal—Lydenburg and Potchefstroom (Ayres), Limpopo river (Eriksson), and Pretoria (Pretoria Mus.); Bechuanaland—Bamangwato (Buckley), Kanye (Exton); Rhodesia—Semokwe and Tati (Oates), Fort Chiquaqua (Sowerby), and Salisbury (Marshall); German South-west Africa—from Great Namaqualand to Ondonga in Ovampoland (Andersson).

Habits.—The rufous-cheeked Nightjar closely resembles the European species in its habits; it is found singly or in pairs in brushwood districts; it seeks its food at dusk and rests during the day either in brushwood or very frequently on the bare ground

on a road or footpath. Its food consists of insects. Mr. Marshall found in the stomach of one examined by him fourteen examples of the coprophilous beetle, *Onthophagus gazella* F.; it appears to be a resident, though Andersson states that it is partially migratory in Damaraland, being commoner in the rainy season. Eggs of this species have been found by Ayres near Potchefstroom in October, and described; by Buckley in Matabeleland; by Jackson near Beaufort West and by Eriksson on the Limpopo in October and November; they are laid on the bare ground without any pretence even of a nest and almost without any noticeable depression, and are two in number; they are of a rich cream or pale pink ground, blotched and clouded with purple and greyish-brown, and measure 1.0×0.75 .

394. **Caprimulgus fervidus.** *Fiery-necked Nightjar.*

Caprimulgus pectoralis (*nec Cuv.*), *Strickl. and Sel. Contr. Orn.* 1852, p. 143; *Gurney in Andersson's B. Damaraland*, p. 45 (1872).

Caprimulgus fervidus, *Sharpe, ed. Layard's B. S. Afr.* p. 86 (1875); *Hartert, Cat. B. M.* xvi, p. 534 (1892); *Shelley, B. Afr.* i, p. 106 (1896); *Hartert, Tierreich, Podarg.* p. 59 (1897); *Woodward Bros. Natal B.* p. 85 (1899).

Description. Male.—Closely resembling *C. rufigena*, but distinguished by its pure golden-buff cheeks (unstreaked with black and rufous as is the case in the *C. rufigena*); a rich, deep red, broad collar crosses the nape of the neck, and the white spots on the four outer primaries are very much smaller than in the other species. Size similar to *C. rufigena*. Sexes, so far as is known, alike in colour, the female having the white spots on the primaries and white tips to the outer rectrices.

Distribution.—The type of this species, described by Sharpe, is from Ovampoland, and there are other examples from the same country in the British Museum. A Nightjar from Barberton in the South African Museum seems referable to this species, and it is further recorded from Eshowe in Zululand (Woodward) and the Umlazi River in Natal (Brit. Mus.). Beyond our limits it was obtained by Böhm at Kakoma in German East Africa.

Habits.—Andersson, the only observer of the habits of this species, stated that it is tolerably common in Damaraland, that it is found singly and is partial to open roads and paths about dusk.

395. **Caprimulgus pectoralis.** *South African Nightjar.*

L'Engoulevent à collier, *Levaill. Ois. d'Afr.* i, pl. 49, p. 186 (1799).

Caprimulgus pectoralis, *Cuvier, Règne Anim.* i, p. 376 (1817); *Sharpe, ed. Layard's B. S. Afr.* p. 84 (1875); *Hartert, Cat. B. M.* xvi, p. 534 (1892); *Sharpe, Ibis*, 1897, p. 496 (Ulundi); *Shelley, B. Afr.* i, p. 106 (1896); *Hartert, Tierreich, Podarg.* p. 59 (1897); *Woodward Bros. Natal B.* p. 85 (1899).

Caprimulgus atrovarius, *Sundev. Ofvers. K. Vet. Akad. Forh.*, 1851, p. 128; *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 41 (1858) [Knysna]; *Layard, B. S. Afr.* p. 48 (1867).

Description. *Male.*—As large as *C. europæus*, but very much darker in colour than either that species or *C. rufigena*; upper surface black vermiculated with grey; a narrow pale rufous collar round the neck, not nearly so marked as in *C. fervidus*; white spots are present on the four outer primaries, the outer one with the spot only on the inner web, the inner three with spots on both webs; the tail very dark with well-developed white tips more than $1\frac{1}{2}$ in. in length to the two outer rectrices on either side; the white spot on the throat is large and well marked, and not divided as a rule.

Iris dark brown.

Length about 10.25; wing 6.1; tail 4.8; culmen 0.4; tarsus 0.8, feathered only on the upper third.

The female resembles the male, but the white wing-spots and the tail-tips are a good deal smaller, the latter measuring less than 1.5.

Distribution.—This bird was first obtained by Levaillant in Houtniqua (*i.e.*, the Knysna district), and seems to be confined to the southern and wooded districts of the Colony, and to Natal and Zululand.

Recorded localities are Cape Colony—Cape div. (Victorin and Layard), Caledon (Layard), George (Atmore), Knysna (Levaill. and Victorin), Port Elizabeth (Rickard), Stockenström (Atmore) and King Williams Town (Brit. Mus.); Natal—Maritzburg (Fitzsimmons and Woodward), Ulundi in Zululand (Woodward).

Habits.—This Nightjar does not differ appreciably from others in its habits; it is not uncommon in the suburbs of Cape Town, where it frequents gardens and orchards, flying at twilight, and making its presence known by its "churring" note. It lays two eggs in a slight depression under the shelter generally of a bush or rock; these are greyish-cream, freckled and blotched with purple,

cylindrical, and equally rounded at both ends. Mr. Layard writes : "At Mr. Vigne's farm, on the Zonder End river (in the Caledon division), a bird of this species has hatched her eggs for several successive years in a flower bed close to a well-used path. I saw her sitting in the beginning of November; she allowed me to approach within two or three feet of her and never once moved from her nest, although I visited her daily. Her eyes were always closed to within a mere thread-like crack, out of which she watched every movement, and she generally rested her head upon a small dead branch that lay beside the nest."

396. **Caprimulgus trimaculatus.** *Freckled Nightjar.*

Scotornis trimaculatus, Swains. *B. W. Afr.* ii, p. 70 (1837).

Caprimulgus lentiginosus, Smith, *Ill. Zool. S. Afr. Aves*, pl. 101 (1845); *Strickland and Sel. Contr. Orn.* 1852, p. 143 [Damaraland]; *Layard B. S. Afr.* p. 47 (1867); *Gurney in Andersson's B. Damaraland*, p. 45 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 87, 803 (1875-84); *Ayres, Ibis*, 1879, p. 288 [Rustenburg]; *Hartert, Cat. B. M.* xvi, p. 536 (1892); *Shelley, B. Afr.* i, p. 106 (1896).

Caprimulgus trimaculatus, *Hartert, Tierreich, Podarg.* p. 55 (1897).

Description. *Adult.*—Very dark brown above, blackish with minute vermiculations, and spots of pale brownish and larger ones of orange-buff on the scapulars and hind neck, these often concealed; quills deep brown with ferruginous spots and bands principally obvious on the inner ones; the first four primaries (sometimes only three) with rounded white spots on the inner webs; tail very dark, the two outer rectrices with large subterminal white spots chiefly on the inner webs; two white spots on the throat; breast blackish-grey with isabelline spots; abdomen ochreous-buff with blackish bars.

Iris umber; bill, legs, and feet dusky.

Length about 11·0; wing 7·8; tail 5·7; tarsus 0·7.

The specimens without white tail-spots are females. Young birds are paler, have more rufous on the primaries, and are without distinct white spots on the throat or tail. This species is distinguished by its size from all South African Nightjars except *C. europæus*, and by its scapulars which are not differently marked from the rest of the upper surface.

Distribution.—This is apparently a rare bird; the types of *C. lentiginosus* of Smith were obtained in Namaqualand, whence

it extends to the Cunene river (Andersson), in northern Damara-land and westwards to Rustenburg (Ayres), in the Transvaal, where it is stated to be fairly common. Although mentioned by Hartlaub ("Ibis," 1862, p. 143) as occurring close to Cape Town, I think this must be a mistake, as Mr. Layard who sent the birds to Dr. Hartlaub to examine does not mention it as occurring near Cape Town in his work, nor is there a specimen in the South African Museum. Beyond our limits this bird is said to be found in Abyssinia, though hitherto not recorded from intermediate countries.

Habits.—Mr. Ayres states: "This is the only kind of Nightjar which I met with about Rustenburg; they frequent the edges of bushy hill-sides, getting well under shelter during the day and coming out to feed in the open in the evening. They are generally solitary, and I never found more than two together."

397. *Caprimulgus fossii*. *Mozambique Nightjar*.

Caprimulgus fossii, *Hartl. Orn. W. Afr.* p. 23 (1857); *Finsch & Hartl. Vög. Ost-Afrikas*, p. 123, pl. i (1870); *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 53 (1882); *Hartert, Cat. B. M.* xvi, p. 551 (1892); *Shelley, B. Afr.* i, p. 107 (1896); *Hartert, Tierreich, Podarg.* p. 45 (1897); *Woodward Bros. Natal B.* p. 86 (1899); *Alexander, Ibis*, 1900, p. 93 [Zambesi River]; *Marshall, Ibis*, 1900, p. 254 [Salisbury].

Caprimulgus mossambicus, *Peters, Journ. Ornith.* 1868, p. 134; *Sharpe, ed. Layard's B. S. Afr.* pp. 88, 803 (1875-84); *Oates, Matabeleland*, p. 300 (1881); *Shelley, Ibis*, 1882, p. 250 [Umfuli R.]; *Symonds, Ibis*, 1887, p. 327 [Kroonstad].

Description. *Male*.—General colour above, ashy-grey mottled with bold black stripes and a little pale rufous, a more or less distinct pale rufous collar round the hind neck; lesser wing-coverts and secondaries with white tips; primary quills dark brown with well-marked white spots on both webs, except in the case of the first; tail irregularly barred with black and tinged on the edge with pale rufous, the outer web and tip of the outer feather white; below pale ochre, the throat, breast, and flanks narrowly barred with blackish; a conspicuous white spot on either side of the throat; under wing-coverts orange-buff.

Iris dark brown; bill pale; culmen and tip dusky; legs and feet dusky-brown.

Length about 10·0; wing 6·40; tail 4·80; culmen 0·40; tarsus 0·78, only the upper third feathered.

Female with the white of the wing-quills rusty and of the lateral rectrices ochreous.

This species varies a good deal in size and shape; the wings of two males, measured in the flesh by Alexander, measured 6·7 and 6·5; those of three females, 5·7, 5·8, and 6·1. One of these was very pale in colour.



FIG. 18.—*Caprimulgus fossii*. $\times \frac{1}{2}$.

Distribution.—This species is found throughout tropical Africa, from the Gold Coast and British east Africa southwards to Rhodesia and Bechuanaland where it appears to be fairly abundant, while stragglers have been obtained at Kroonstad in the Orange River Colony, and on the Umlatusi river in Zululand. In Bechuanaland and Rhodesia it has been recorded from Tati (Oates), near Pandamatanka (Holub), Makaleka country (Brit. Mus.), Umfuli and Hanyani rivers (Ayres), near Salisbury (Marshall), Tete (Kirk), Senna and Chicowa on the Zambesi (Alexander).

Habits.—Holub states that this Nightjar is very abundant in the dry country on the road to the Victoria Falls; here they are found seated on the bare ground, which they so closely resemble that it is impossible to see them till they are flushed. They fly noiselessly and with great rapidity through the thickest bushes; Ayres found them common on the Hanyani river, where their incessant chirring notes disturbed his night's rest; and Alexander came across them many times on the Zambesi, on waste ground overgrown with weeds near the river, in localities covered with thick long grass, and open stony patches in thick woods. As with other Nightjars the food consists wholly of insects such as beetles and moths. The note is a chirring or grinding sound constantly repeated, but there is, accord-

ing to Alexander, no call note as in the European bird. Ayres states that he saw a male seated crosswise on a branch, though this is contradicted by Böhm, an observer in German east Africa. Little is known about the breeding of this species. Ayres found an egg on the Bembesi river in Mashonaland on October 19, but gives no further details. Reichenow states that the eggs are white spotted with grey and brown, and measure 24×18 mm. (*i.e.*, 0.94×0.70).

398. *Caprimulgus natalensis*. *Natal Nightjar*.

Caprimulgus natalensis, *A. Smith, Ill. Zool. S. Afr. Aves*, pl. 99 (1845); *Gurney, Ibis*, 1859, p. 243, 1860, p. 204; *Layard, B. S. Afr.* p. 46 (1867); *Sharpe, ed. Layard's B. S. Afr.* p. 88 (1875); *Hartert Cat. B. M.* xvi, p. 564 (1892); *Shelley, B. Afr.* i, p. 107 (1896); *Woodward Bros. Natal B.* p. 86 (1899).

Description. Male.—General colour above, a rufous-brown mottled and streaked with black; a narrow eyebrow and supra-loreal streak isabelline; no sign of a collar; scapulars with marked triangular black spots, wing-coverts mottled black, white and pale fulvous; quills dark brown with fulvous mottlings on their inner edges and white spots on the first three only; central tail-feathers mottled black and fulvous crossed by narrow well-marked black bars; outer tail-feathers with a white outer web and a white tip occupying about half the feather, next pair with only the white tips occupying a little less than half the feathers; a well-marked white spot on the throat; upper breast mottled black and ochre; lower breast ochre barred with black; abdomen and under tail-coverts plain ochre unbarred.

Iris dark brown.

Length about 9.25; wing 5.8; tail 4.25; culmen 0.45; tarsus 0.70, hardly feathered at all.

Female resembling the male but distinguished by its paler back and rump, the spots on the primaries being smaller and sandy-buff, and the outer tail-feathers being brown barred with sandy-buff.

Distribution.—Natal, re-occurring in the Gold Coast. The type was obtained by Sir A. Smith, close to Durban, it has been also obtained at Pinetown by Ayres, and was observed by Stark near Maritzburg. Hitherto this bird has not been recorded elsewhere in South Africa, but a closely allied species, only distinguished by its smaller size, occurs in West Africa, while Hartert includes in

the British Museum Catalogue, a typical example of the present species from Christianborg on the Gold Coast.

Habits.—The Natal Nightjar does not appear to differ from its congeners in habits. It spends the day lying retired in bush or fern, and appears in the evening to hawk for insects. Its note is liquid and mellow, and may be often heard on fine nights. Dr. Stark, who heard this bird's melodious call in the thickly planted grounds of a house at Maritzburg, states that it can be fairly imitated by a good whistler but hardly by syllables; it consists of eight notes; the first three of these are dwelt upon; the last three run into one another in a prolonged trill. Ayres found in the stomach of this Nightjar large and hard beetles swallowed whole. These birds feed only at night and are fond of frequenting roads and bare ground whence they rise to catch any passing insect and quickly settle again. The flight is noiseless. The Woodward's have found the eggs of this Nightjar laid on the ground without any trace of a nest; they are the size of those of a large thrush and, as in all Nightjars, equally rounded at both ends; their colour is a pinkish-white slightly spotted with red.

Genus II. **COSMETORNIS.**

Type.

- Semeiophorus**, *Gould (nec Agass.)*, *Icon. Av.* ii, pl. 2
(1838) C. *vexillarius*.
Cosmetornis, *Gray*, *List Gen. B.* p. 8 (1840)..... C. *vexillarius*.

This genus is closely allied to *Caprimulgus*; it is distinguished by the fact that the first primary is longer than the others up to the sixth; in the breeding male the seventh and eighth are considerably elongated while the ninth is prolonged to about three times the length of the first and forms the so-called streamer or standard. The shaft of the elongated feather is feathered throughout. Only one species of this curious genus is recognised.

399. **Cosmetornis vexillarius.** *Standard-wing Nightjar.*

Semeiophorus vexillarius, *Gould*, *Icon. Av.* ii, pl. 3 (1838); *Hartlaub*, *P. Z. S.* 1867, p. 821.

Cosmetornis vexillarius, *Hartlaub*, *Ibis*, 1862, p. 143; *P. L. Sclater*, *Ibis*, 1864, p. 114, pl. 2 [Uganda]; *Kirk*, *ibid.* p. 323 [Tete]; *Gurney*, *Andersson's B. Damaraland*, p. 45 (1872); *Sharpe*, *ed.*

Layard's B. S. Afr. pp. 89, 803 (1875-84); *Oates, Matabeleland*, p. 301 (1881); *Shelley, Ibis*, 1882, p. 240 [Mashonaland]; *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 54 (1882); *Hartert, Cat. B. M.* xvi, p. 595 (1892); *Shelley, B. Afr.* i, p. 107 (1896); *Sowerby, Ibis*, 1898, p. 570 [Ft. Chiquaqua]; *Alexander, Ibis*, 1900, p. 94 [Zambesi]; *Marshall, ibid.* p. 245 [Salisbury]; *Woodward Bros. ibid.* p. 520 [St. Lucia Lake].

"Amadamba" of Mashonas; "Manocoella" of Matabele (Ayres).

Description. *Male*.—Above, dark brown mottled and barred with pale rufous and black, a distinct dark rufous collar on the nape of the neck spotted with black; primaries deep brown, white at their bases for about one-third their length and tipped with white, the seventh and eighth are somewhat elongated and not white tipped, the ninth is elongated to about three times the entire length of the bird, white at the base, along the shaft and inner web, the outer web darker; a white spot on the throat; breast



FIG. 19.—Wing of *Cosmetornis vexillarius*. $\times \frac{1}{3}$.

rufous, abdomen white, both barred with blackish-brown, tail-coverts white, tail below, mottled black and white barred with black.

Iris dark brown; upper mandible and tip of lower dusky, base of latter flesh-coloured; legs and feet dusky-brown.

Length about 10·5; wing (along first primary) 8·50; eighth primary 11·25; ninth primary 29·5; tail 5·5; culmen 0·42; tarsus 0·90.

The female differs from the male in the following points; the rufous collar is narrower, the abdomen and under tail-coverts are buff barred with dark brown; there are no elongated primaries, and the wing-quills are deep brown with five large rufous spots on both webs.

Distribution.—The Standard-wing Nightjar is only found in the more tropical portions of South Africa extending from the northern part of Damaraland along the Zambesi through Mashona-

land to Zululand. North of the Zambesi it is spread all over central Africa to Fernando Po on the west and to Uganda and German east Africa on the east. The original type of the species is said to have come from Madagascar, but as the bird has not since been found there, this appears to have been a mistake.

The following are recorded localities: Natal—Escourt (Durban Mus.); Zululand—St. Lucia Lake (Woodward); Rhodesia—Hartley and Salisbury districts (Ayres and Marshall), Victoria Falls (Oates); Portuguese east Africa—Tete (Kirk); German, south-west Africa—Elephant's Vlei (Andersson).

Habits.—The Standard-wing Nightjar appears to be fairly common in Mashonaland, being found in pairs or (perhaps after the breeding season) in small flocks, in open spots near water. Like other Nightjars they are crepuscular in habits, resting during the day on the ground. When flushed they fly only a short distance, and quickly settle again on the ground. Ayres states, however, that the male, unlike the female, will sometimes perch lengthwise on a branch, the long wing feathers *hanging to one side*. Sometimes they fly high, especially in calm evenings, but the males find the long streamers on their wings somewhat of an encumbrance. Like other nightjars their food consists only of insects taken on the wing. Oates found the stomach of one examined by him to contain winged ants and a large beetle. In the evening, just at dark and afterwards, the cock birds call frequently, uttering a curious strident note much like the squeak of a mouse, "tswee, tswee, tswee," often repeated. The male birds only assume their long plumes in August for the breeding season, in September and October they are already much abraded, and in December or January they are shed. Two clutches of eggs were taken by Ayres on September 28 and 30; they are laid as usual on the bare ground, sometimes under trees, sometimes in more open ground; the colour of the eggs is differently described, probably there is some variation in this respect. Some are light, ruddy-brown with milky or ashy patches, others are described by Marshall as pinkish-white with rusty-brown spots and blotches thicker at the larger end. They vary also in size from 1.25 to 1.0 × .80 to .75. When the eggs are dried the colours fade.

Suborder III. ANISODACTYLI.

Deep plantar tendons coracine, *i.e.*, hallux connected with the flexor perforans digitorum (fig. 2e, p. 2); palate desmognathous (fig. 5, p. 5); ambiens muscle absent.

In addition to the families of Rollers, Bee-eaters, Kingfishers, Mouse-birds and Hornbills represented in South Africa, the Motmots and Todies of the neotropical region and perhaps the Madagascar Roller (*Leptosomatidæ*) should be included in the sub-order.

Family I. CORACIIDÆ.

Bill stout, corvine in shape, the upper mandible toothed near the end; the outer toe united to the middle one at the extreme base only, so that it is reversible at will, the inner toe united to the third by its basal joint; nostrils at the base of the mandible; dorsal feather tract well defined on the neck and forked on the upper back (fig. 1, p. 2); oil gland present but nude; caeca present.

This family is confined to the temperate and tropical portions of the old world.

Key of the Genera.

- A. Bill elongated; breadth at the gape about half the length of the culmen *Coracias*, p. 45.
 B. Bill short and broad, breadth at the gape about equal in length to the culmen *Eurystomus*, p. 53.

Genus I. **CORACIAS.***Type.*

Coracias, *Linn. Syst. Nat.* 12th ed. i, p. 159 (1766) ... *C. garrula*.

Bill elongated and slightly compressed; its breadth at the gape about half the length of the culmen; a few short but strong rictal bristles; wing of ten primaries, the second or third the longest, the first not falling very far short of it; tarsus short, less than the length of the middle toe; tail of twelve feathers.

This genus contains the Rollers, birds of bright plumage and powerful flight, spread over the greater part of Europe, central and southern Asia as far as Celebes, and the whole of Africa. Shelley's list contains the names of nine species occurring in the

last-named continent, and four of these have been obtained within our limits.

Key of the Species.

- A. Outer tail-feathers not elongated.
- a. No nuchal patch; blue below *C. garrulus*, p. 46.
 - b. A white nuchal patch; below, lilac with white streaks..... *C. mosambicus*, p. 51.
- B. Outer tail-feathers elongated.
- c. No expanded racquet on the elongated tail-feathers; primary coverts silvery-blue ... *C. caudatus*, p. 48.
 - b. Outer tail-feathers ending in a racquet-shaped expansion; primary coverts purplish-blue, like the primaries *C. spatulatus*, p. 50.

400. **Coracias garrulus.** *European Roller.*

Coracias garrula, *Linn. Syst. Nat.* 12th ed. i, p. 159 (1766); *Layard, B. S. Afr.* p. 60 (1867); *Gurney, Ibis*, 1872, p. 56; *Ayres, Ibis*, 1874, p. 102 [Potchefstroom]; *Sharpe, ed. Layard's, B. S. Afr.* pp. 102, 805 (1875-84); *Shelley, Ibis*, 1875, p. 68 [Pinetown]; *Barratt, Ibis*, 1876, p. 198 [Lydenburg]; *Oates, Matabeleland*, p. 302 (1881); *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 61 (1882); *Shelley, Ibis*, 1882, p. 242 [Palapye]; *Symonds, Ibis*, 1887, p. 327 [Kroonstad]; *Sharpe, Cat. B. M.* xvii, p. 15 (1892); *Dresser, Monogr. Corac.* p. 19, pl. 7 (1893); *Rendall, Ibis*, 1896, p. 167 [Barberton]; *Shelley, B. Afr.* i, p. 109 (1896); *Woodward Bros. Natal B.* p. 87 (1899); *Marshall, Ibis*, 1900, p. 246 [Salisbury].

Coracias abyssinicus, *Layard (nec Bodd.)*, *B. S. Afr.* p. 60 (1867).

Coracias garrulus loquax, *Reichenow, Ornith. Monatsb.* vii, p. 191 (1899).

“Blue Jay” of the English colonists.

Description. Female.—Crown and nape a greenish-blue, back, scapulars, and inner secondaries light brown; wing-coverts pale blue, purplish on the carpal bend and ulna, and with brown tips to some of the feathers; wing-quills purplish-black above, bright purplish-blue below, with black tips; rump a purplish-blue, tail-coverts a more greenish-blue, two centre tail-feathers dusky ashy-green, the others green at the base, blackish on the inner web, with a black shaft and pale green tips, the outer pair only tipped with black; below, a pale greenish-blue, with whiter shaft marks on the chin and throat and a slight brown shading on the breast.

Iris dark grey or hazel; bill black; legs and feet brownish-yellow.

Length about 13.0; wing 7.70; tail 5.20; culmen 1.30; tarsus 0.80.

The male and female are alike in size and colour. Reichenow states that the African birds differ from those of Europe and Asia, in having a strongly-marked greenish tinge on the head and neck. He suggests that either the African form is a sub-species, or perhaps that, if it is a migrant from Europe, it undergoes a double moult on arrival and before departure.

Distribution.—The Roller is found all over Central Europe, western Asia as far as Kashmir, and Northern Africa, where it breeds; it passes through Egypt and north-east Africa on migration, and winters in east and south Africa. Within our limits it is rare south of the Orange River, in fact single specimens only have been noted from Springbokfontein in Namaqualand, by Layard, and from East London by Rickard, while Mr. Pym writes that he shot one of a pair close to King Williams Town in February, 1902.* The following are other recorded localities: Natal—Umbilo River, near Durban, January and February (S. A. Mus.), Pinetown in January (Shelley); Orange River Colony—Kroonstad in May (Symonds); Transvaal—Komatipoort in January (S. A. Mus.), Barberton (Randall), Potchefstroom in December (Ayres), Rustenburg (S. A. Mus.); Bechuanaland—Palapye in December (Ayres); Rhodesia—Tati in March (Oates), near Salisbury, September to April (Marshall), Pandamatenka, November (Holub); Damaraland—Ondonga and Otjimbingue in January (Andersson).

Habits.—The European Roller appears to be nowhere very common in South Africa. According to Marshall it arrives from the north in September and leaves again in April; and he further states that he believes that it breeds in Mashonaland, as he saw young birds in January and February, but further evidence is required to confirm this, as the same bird breeds in Europe in the northern summer. The European Roller is fond of sitting motionless on the top of isolated trees in open country, and is often seen perched on telegraph wires. It is a somewhat tamer and more sluggish bird than *C. caudatus*. Its food consists of large grasshoppers and beetles taken from the ground, and it becomes very fat at times.

In Europe the eggs, five to six in number, and glossy-white in colour, are laid in a hollow tree or a hole in a wall, or even in a

* A pair, recently received by the South African Museum, was obtained at Port St. John in January by Mr. Shortridge.

high bank, a bedding of grass and feathers being usually provided. During the breeding-season the male indulges in extraordinary tumbling antics in the air, whence it has derived its English trivial name.

401. **Coracias caudatus.** *Moselikatze's Roller.*

Coracias caudata, *Linn. Syst. Nat.* 12th ed. i, p. 160 (1766); *Kirk, Ibis*, 1864, p. 324 [Zambesi]; *Layard, B. S. Afr.* p. 61 (1867); *Gurney, Ibis*, 1868, p. 461 [Natal]; *Layard, Ibis*, 1869, p. 364 [Bechuanaland]; *Sharpe, Ibis*, 1871, p. 194; *Gurney in Andersson's B. Damaraland*, p. 53 (1872); *Buckley, Ibis*, 1874, p. 364 [Transvaal]; *Sharpe, ed. Layard's B. S. Afr.* pp. 104, 805 (1875-84); *Barratt, Ibis*, 1876, p. 198 [Rustenburg]; *Ayres, Ibis*, 1879, p. 290 [Rustenburg]; *Oates, Matabeleland*, p. 302 (1881); *Shelley, Ibis*, 1882, p. 243 [Umfuli River]; *Holub & Pelzeln Orn. Süd-Afrikas*, p. 59 (1882); *W. Ayres, Ibis*, 1887, p. 50 [Zoutspansberg]; *Sharpe, Cat. B. M.* xvii, p. 21 (1892); *Dresser, Monogr. Corac.* p. 9, pl. 3 (1893); *Shelley, B. Afr.* i, p. 109 (1896); *Rendall, Ibis*, 1896, p. 197 [Barberton]; *Sharpe, Ibis*, 1897, p. 497 [Ulundi]; *Woodward Bros. Natal B.* p. 88 (1899); *Alexander, Ibis*, 1900, p. 95 [Zambesi]; *Marshall, Ibis*, p. 246 [Umfuli River].

"Moselikatze's Bird" of English; "Fefe" of Zulus and Matabele; "Veve" of Swazis; "Le-cler-cler" of Bechuanas.

Description.—Crown and nape a pale green with a hoary-white frontal band extending over the eye; back, scapulars and inner secondaries pale brown; greater wing-coverts pale cobalt-blue, lesser-coverts and feathers along the carpal joint and ulna bright ultramarine-blue; basal half of the wing quills cobalt-blue, distal half black on the inner webs, ultramarine-blue on the outer, from below, black on the outer, ultramarine on the inner webs; rump ultramarine, upper tail-coverts lighter blue; central pair of tail-feathers oily-green, the others pale cobalt tipped with darker, the outer pair narrowed and elongated to nearly twice the length of the other feathers, the narrow portion darkening to black; below the chin is hoary-white, the throat, cheeks and breast rich vinous with a few white shaft marks on the throat; abdomen, under wing- and tail-coverts bright cobalt-blue.

Iris dark hazel; bill black; legs and feet greenish-yellow.

Length to middle tail-feather about 11·0; wing 6·60; tail to end of middle feather 4·90; to end of elongated feather 7·25 to 8·50; culmen 1·15; tarsus ·85.

The female resembles the male in every respect including the elongated tail-feathers.

A young male in the South African Museum is somewhat paler in colour throughout, and is without the elongated tips to the outer tail-feathers.

Distribution.—This Roller is not found south of the Orange River, nor has it yet been observed in the Orange River Colony; north of these limits and from Natal it is fairly abundant throughout South Africa extending to Angola on the west, and to the Victoria Nyanza and Mombasa on the east. The following are recorded South African localities: Cape Colony—Kuruman (Moffatt), Linokana, near Mafeking (Holub); Natal—Durban (Brit. Mus.), near Maritzburg (Maritzburg Museum); Ifafa, Ulundi in Zululand (Woodward); Transvaal—Lydenburg (S. A. Mus.), Zoutspansberg (W. Ayres), Pretoria (Buckley), Rustenburg and Marico (Barratt); Bechuanaland—Palapye (Ayres), Lake Ngami (Andersson); Rhodesia—Tati (Holub), Wankies and Victoria Falls (Oates) Umfuli River (Ayres); Damaraland—Otjimbingue (Andersson) Portuguese east Africa—Tete (Kirk).

Habits.—This bird seems to have attracted a good deal of attention on account of its bright plumage, bold ways and abundance in certain parts of the country; it is found singly or in pairs, and is generally seen perched on the topmost branch of a high tree, whence it keeps a good look out for insects, which form the bulk of its food. It is shy and wary and is thus very difficult to shoot; it is also bold and pugnacious, driving off other large birds such as hawks and crows should they venture near its chosen resting place. When disturbed it gives vent to harsh and loud discordant screams as it makes off with circling flight. Its food consists of large insects such as grasshoppers and beetles, which it usually catches and devours on the ground; it will also follow bush-fires to catch the insects as they are flushed by the heat of the burning. Oates found in the stomach of an individual killed by him, a snake one foot long, and in another a lizard, so they do not entirely confine their attentions to the insect world. Mr. Marshall thus describes the breeding habits of this Roller: "During the breeding season it (apparently the male) will mount to a considerable height with its curious rolling flight, rising in stages and screaming all the while, then suddenly turning over and diving straight down. I took a nest of this species at the Umfuli on October 24, 1895. It was in a hole in a tree, about twenty feet from the ground and contained three white eggs, moderately incubated; two of these were nearly

spherical, the third being very pointed at one end, much like a plover's egg in shape."

This bird is associated with Moselikatze, the old King of the Matabeles, and father of Lobengula, as he claimed its feathers solely for his own royal use and adornment. Probably his interest in the bird was excited by its pugnacity and liveliness.

Dr. Holub kept two in captivity for some time; they became very tame and would eat out of his hand; he found them, however, no match for a pair of parrots placed with them in the same cage.

402. **Coracias spatulatus.** *Racquet-tailed Roller.*

Coracias spatulatus, *Trimen*, *Proc. Zool. Soc.* 1880, p. 30 [with woodcut of tail]; *Shelley*, *Ibis*, 1882, p. 243 [Umfuli River]; *Sharpe*, *ed. Layard's B. S. Afr.* p. 805 (1884); *id. Cat. B. M.* xvii, p. 22 (1892); *Dresser*, *Monogr. Corac.* pp. 13, 17, pls. 4-6 (1893); *Shelley*, *B. Afr.* i, p. 109 (1896); *Marshall*, *Ibis*, 1900, p. 246.

Description. *Male.*—Type of the species. Head and neck pale brownish-green, a marked frontal band and eyebrow white; back, secondaries, and some of the inner wing-coverts pale brown, the outer coverts, carpal and ulna edge of the wing ultramarine-blue; wing-quills like those of *C. caudatus*, cobalt at the base, ultramarine and black at the tip; rump and upper tail-coverts ultramarine; central pair of tail-feathers black, next pair ultramarine, the next pair the same with a cobalt edging, the outer feathers with increasing cobalt and diminishing ultramarine portions; the outer pair narrowed and elongated half as long again as the other feathers and ending in a racket-shaped portion all of which is black; general colour below, cobalt-blue with a shade of vinous on the cheeks and ear-coverts, and a patch of lilacy-brown on the sides of the breast; the throat and breast with paler shaft marks.

Iris yellowish-brown; bill black; legs and feet greenish-yellow.

Length to middle tail-feather 10·5; wing 6·5; tail 4·90, with racket 8·0; culmen 1·15; tarsus 0·80.

The female resembles the male in colour and size. Young birds have a stronger tinge of lilac on the cheeks and sides of the breast.

Distribution.—The type of this species was obtained by Dr. Bradshaw in the Lechumo valley a little to the south of the junction of the Chobe and Zambesi rivers; it has also been procured within our limits in Mashonaland on the Umfuli river by Ayres,

and on the Hanyani and Mazoe rivers by Marshall. North of the Zambesi, its range extends to Caconda in Angola, and to Unyamwesi in German east Africa.

Habits.—Mr. Trimen, from information derived from Dr. Bradshaw, states that the Racquet-tailed Roller is found chiefly in a tract of heavy sand-ridges termed the zandveld, in the neighbourhood of the Victoria falls, while Mr. Marshall found the species very local and only among the heavier timber in the vicinity of the rivers. In winter it goes in small flocks of ten or twelve, while during the rains from November to March, it is scarcer and seldom seen. Marshall gives the following account of it: "In some ways its habits are notably different from those of its congeners. It is never found sitting on the summits of trees at the outskirts of the bush, but only on the lower branches further within; it is comparatively tame; and its courting gambols are also distinct, for it will fly with a very rapid zig-zag for some distance, and then suddenly shoot straight up into the air for fifteen or twenty feet with closed wings, curving gently over and down again head foremost, screaming all the while. *C. spatulatus* is quite as quarrelsome as *C. caudatus*, and even more noisy. I can only compare its cries to the yelping of a litter of puppies. Stomachs contained grasshoppers, with beetles and large fly-maggots evidently taken from carrion."

403. *Coracias mosambicus*. *Purple Roller*.

Coracias pilosa (*nec Lath.*), Gurney, *Ibis*, 1868, p. 461 [Natal]; Holub & Pelzeln, *Orn. Süd-Afrikas*, p. 61 (1881).

Coracias nuchalis (*nec Swains.*) Layard, *B. S. Afr.* p. 60 (1867).

Coracias nævia, (*nec Daud.*) Sharpe, *Ibis*, 1871, p. 190; Gurney, in Andersson's *B. Damaraland*, p. 54 (1872); Buckley, *Ibis*, 1874, p. 363; Sharpe, ed. Layard's *B. S. Afr.* pp. 103, 805 (1875-84); Ayres, *Ibis*, 1879, p. 290 [Rustenburg]; Oates, *Matabeleland*, p. 302 (1881); Ayres, *Ibis*, 1882, p. 243 [Umfuli River]; Symonds, *Ibis*, 1887, p. 327 [Kroonstad].

Coracias mosambica, Dresser, *Ibis*, 1890, p. 385; *id.* *Monogr. Corac.* p. 43, pl. 11 (1893); Shelley, *B. Afr.* i, p. 110 (1896); Alexander, *Ibis*, 1900, p. 95 [Zambesi].

Coracias olivaceiceps, Sharpe, *Cat. B. M.* xvii, p. 25 (1892); Woodward Bros. *Natal B.* p. 87 (1899); Marshall, *Ibis*, 1900, p. 247 [Salisbury].

Description. *Male.*—General colour above, olive-green; frontal band, eyebrow and a patch on the nape of the neck white, behind the white nape patch a purple shading forming an incipient collar;

wing-coverts reddish-lilac, those at the carpal joint and the edge of the wing ultramarine-blue like the wing-quills which, however, shade into black on their inner edges, inner secondaries like the back; rump and upper tail-coverts ultramarine; two central tail-feathers oily-green; the lateral ones bright ultramarine-blue; general colour below, reddish-lilac, rather more purplish on the throat, streaked throughout including the cheeks and ear-coverts with conspicuous white shaft markings; under wing-and tail-coverts without shaft markings.

Iris dark brown; bill black; legs and feet greenish-brown.

Length about 14·0; wing 7·40; tail 5·30; culmen 1·50; tarsus 0·75.

The female resembles the male but is perhaps slightly smaller, wing 7·2.



FIG. 20.—*Coracias mosambicus*. $\times \frac{9}{16}$.

Distribution.—The Purple Roller has only been once recorded from south of the Orange River, nor does it appear to be at all common in the Orange River Colony or Natal; north of the Vaal it is generally distributed up to the Zambesi and south Angola. In east, north-east and west Africa this species is replaced by a closely allied form (*C. naevius*) in which the crown is reddish-lilac instead of olive. The exact boundary between these two species has hardly yet been defined.

South African localities for the Purple Roller are: Cape Colony—Middelburg (Layard), Hay div. (Layard); Natal—Maritzburg only once (Woodward); Orange River Colony—Kroonstad once only

(Symonds); Transvaal—Selati railway Lydenburg (S.A. Mus.), Rustenburg (Ayres); Bechuanaland—Kanye (Exton), Bamangwato (Ayres), Lake regions (Andersson); Rhodesia—Tati (Holub), Wankies (Oates), Umfuli river (Ayres), near Salisbury (Marshall); German south-west Africa—Otjimbingue and Ondonga (Andersson), Omaruru (Eriksson); Portuguese east Africa—Chicowa on the Zambesi (Alexander).

Habits.—The Purple Roller seems to resemble its congeners in its habits but to be somewhat more lethargic and less noisy and aggressive. Though widely distributed it nowhere seems to be very common and is probably a partial migrant. It is generally seen in pairs and is not very shy; it has the habit of rising suddenly up into the air, rocking to and fro and then descending in a similar manner, somewhat like a kite falling after the string is cut. Like other Rollers it has a harsh and grating voice, compared by Andersson to the sound of a broad-bladed knife passing through a tough piece of cork though of course in a louder key; its food consists of small snakes and lizards, centipedes, scorpions and insects which are generally secured on the ground though often watched for from an elevated position, in which habit it resembles the ordinary butcher bird or fiscal. The breeding habits of the Purple Roller are described by Andersson; they commence operations very early in Damaraland, selecting usually a hollow tree which has been previously occupied by a Woodpecker. Andersson states that he believes that the eggs are two in number and white in colour, and that both parents assist in incubation, though he does not seem to have personally made these observations.

Ayres has stated that young birds are easily reared on raw meat and insects, which they toss up in the air before swallowing, but he found them very troublesome on account of their noisy habits.

Genus II. EURYSTOMUS.

Type.

Eurystomus, *Vieill. Analyse*, p. 37 (1816).....E. *orientalis*.

Bill short and broad, its width at the gape equal to the length of the culmen; terminal portion of the upper mandible hooked and pointed; no rictal bristles; other characters as in *Coracias*. This genus containing some ten species is spread over tropical Africa, Madagascar and southern Asia, extending to Manchuria in one

direction and through the East Indian Islands to Australia in the other. Out of three African species, one just enters our limits.

404. **Eurystomus afer.** *Cinnamon Roller.*

Coracias afra, *Lath. Ind. Orn.* i, p. 172 (1790).

Eurystomus afra, *Stephens, Genl. Zool.* xiii, p. 97 (1826); *Kirk, Ibis*, 1864, p. 324 [Zambesi]; *Sharpe, Ibis*, 1871, p. 274; *id. ed. Layard's B. S. Afr.* pp. 106, 806 (1875-84); *Ayres, Ibis*, 1877, p. 342 [Potchefstroom]; *Oates, Matabeleland*, p. 302 (1881); *Shelley, Ibis*, 1882, p. 243 [Umfuli River]; *Sharpe, Cat. B. M.* xvii, p. 30 (1892); *Dresser, Monogr. Corac.* p. 57, pl. 15 (1893); *Shelley, B. Afr.* i, p. 109; *Sowerby, Ibis*, 1893, p. 571 [Ft. Chiquaqua]; *W. L. Sclater, Ibis*, 1899, p. 112 [Inhambane]; *Alexander, Ibis*, 1900 p. 94 [Zambesi]; *Marshall, ibid.* p. 247 [Umfuli River].

'Tchegala" of Matabele (Oates).

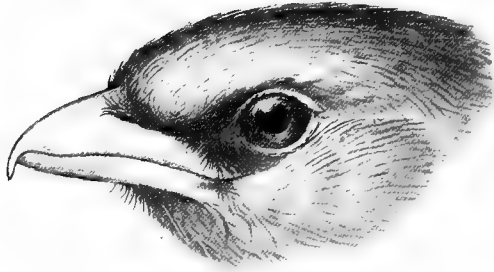


FIG. 21.—*Eurystomus afer*. $\times \frac{9}{16}$.

Description.—General colour cinnamon-brown, slightly tinged with lilac above the eye; coverts at the edge of the wing and all the greater series ultramarine-blue, wing-quills also ultramarine-blue becoming black at the tips and on the inner web; rump and upper tail-coverts a dull cobalt-blue; central tail-feathers like the rump washed with black; lateral feathers bright cobalt with ultramarine tips shading into black; under surface of the body including the cheeks, ear-coverts, sides of the neck, and under wing-coverts a bright somewhat metallic-lilac; under surface of the inner webs of the wing-quills, lower abdomen and under tail-coverts and thighs, pale cobalt-blue.

Iris hazel ; bill bright yellow ; legs and feet greenish-brown.

Length 10·25 ; wing 6·8 ; tail 3·48 ; culmen 0·85 ; tarsus 0·75.

The female resembles the male. There is a good deal of variation in size among specimens of this bird. Birds from East Africa being as a rule larger than those from West Africa.

Distribution.—The Cinnamon Roller is widely distributed all over the tropical portions of Africa from Senegambia, Abyssinia, and the upper Nile valley, southwards to the Zambesi; south of that river it is found, though rarely, in Mashonaland and Portuguese east Africa and has been once noticed in the Transvaal. The following are South African localities : Transvaal—Potchefstroom in November (Ayres); Rhodesia—Umvungu river near Gwelo in November (Oates), Umfuli River in October (Ayres and Marshall), Ft. Chiquaqua (Sowerby); Portuguese east Africa—Inhambane in September (Francis), Tete (Kirk).

Habits.—Little has been noticed regarding the habits of the Cinnamon Roller ; most of the examples procured in South Africa have been shot in the months of September and November, and it is probably a migrant from Central Africa ; it is usually found in small parties in which the males predominate. They are noisy creatures with unmelodious voices and often combine to mob hawks and other large birds ; their flight is swift and graceful, uniting the qualities of the hawk and the swallow ; they often continue on the wing till late at night, retiring finally to a large tree where they roost together in companies and continue their noisy chatterings throughout the night.

The Cinnamon Roller feeds on insects ; beetles and cicadas have been found in its stomach ; these are usually caught on the wing. Alexander found this bird breeding on the Zambesi in the middle of November in holes in the baobab trees, but does not seem to have taken the eggs ; he observed that the males apparently do not assist in the duties of incubation.

Family II. MEROPIDÆ.

Bill long, slender and curved throughout, culmen ridged, both mandibles pointed ; legs and feet feeble and syndactyle, the outer or fourth toe united to the middle or third as far as the last joint, the second and third by the basal joint only ; primaries ten ; tail-feathers twelve ; sexes alike or nearly so ; dorsal feather-tract well

defined on the neck, forked on the upper back (fig. 1, p. 2); oil gland naked; caeca present.

The Bee-Eaters are a family of birds of bright plumage, confined to the Old World: they all breed in holes in sandbanks or similar situations, and lay rounded white eggs.



FIG. 22.—Foot of *Merops nubicoides*.

Key of the Genera.

- A. Central tail-feathers elongated *Merops*, p. 56.
 B. Outer tail-feathers elongated; tail forked..... *Dicrocercus*, p. 64.
 C. Tail square, no feathers elongated *Melittophagus*, p. 67.

Genus I. **MEROPS.**

Type.

Merops, *Linn. Syst. Nat.* 12th ed. i, p. 182 (1766)..... *M. apiaster*.

Bill long, slender, and pointed; the nostrils large, rounded, and generally covered with plumes; a few short rictal bristles; wings pointed, the first primary minute, hardly reaching beyond the wing-coverts, the second the longest; secondaries falling short of the primaries by a considerable amount; tail with the two central feathers elongated and attenuated in both sexes.

This is a large genus of brightly-coloured birds, spread all over the Old World. Some twelve African species are recognised by Shelley, four of which enter our limits.

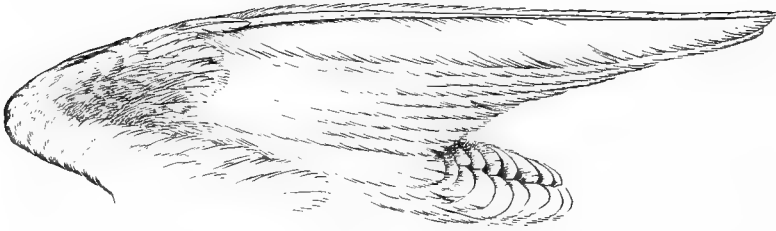


FIG. 23.—Wing of *Merops nubicoides*. $\times \frac{3}{4}$.

Key of the Species.

- A. Crown chestnut becoming cinnamon on the back *M. apiaster*, p. 57.
 B. Crown cinnamon-rufous, contrasting with the green back..... *M. boehmi*, p. 61.
 C. Crown and back alike green..... *M. persicus*, p. 59.
 D. Crown verdigris-green; back cinnamon..... *M. nubicoides*, p. 62.

405. **Merops apiaster.** *European Bee-Eater.*

Merops apiaster, *Linn. Syst. Nat.* 12th ed. i, p. 182 (1766); *Burchell, Travels*, i, p. 501 (1822) [Griquatown]; *Smith, S. Afr. Quart. Journ.* (2) ii, p. 319 (1834); *Grill, K. Vet. Akad. Handl. Stockholm* ii, no. 10, p. 46 (1858) [Oudtshoorn]; *Layard, B. S. Afr.* p. 68 (1867); *Gurney, Andersson's B. Damaraland*, p. 60 (1872); *Buckley, Ibis*, 1874, p. 363 [Bamangwato]; *Sharpe, ed. Layard's B. S. Afr.* pp. 96, 804 (1875-84); *Shelley, Ibis*, 1875, p. 69 [Durban]; *Oates, Matabelèland*, p. 301 (1882); *Holub & Pelz. Orn. Süd-Afrikas*, p. 65 (1882); *Ayres, Ibis*, 1884, p. 223 [Rustenburg]; *Dresser, Monogr. Merop.* p. 75, pl. 18 (1884); *Ayres, Ibis*, 1885, p. 242 [Potchefstroom]; *Sharpe, Cat. B. M.* xvii, p. 63 (1892); *Distant, Transvaal*, p. 160 (1892); *Marshall, Ibis*, 1896, p. 241 [Salisbury]; *Shelley, B. Afr.* i, p. 111 (1896); *Alexander, Ibis*, 1900, p. 97 [Zambesi]; *Marshall, ibid.* p. 248 [Salisbury].

“Berg zwaluw” (*i.e.*, Mountain Swallow) of the Dutch. “Makwirok-wiro of Mashonas (Marshall).

Description. Male.—Forehead white, with a yellow tinge, followed by a yellowish-green shade continuous with an eyebrow of the same colour on either side; crown and mantle dark chestnut fading into cinnamon on the lower back and rump, green on the upper tail-coverts; the lesser wing-coverts green, the others and the outer secondaries chestnut, the primaries and inner secondaries green, all the quills tipped with black, all the tail-feathers green,

the two centre ones attenuated, elongated about an inch and tipped with black; lores, feathers round the eye and ear-coverts, black; chin and throat bright yellow, followed by a narrow transverse black band, rest of the lower surface a greeny-blue, paler on the abdomen and lower tail-coverts; under wing-coverts very pale buff; wing-quills and tail-feathers dusky below.

Iris bright red; bill black; legs and feet greyish-brown.

Length to outer tail-feathers about 9·4; wing 5·70; tail 3·70, to end of central tail-feathers 4·80; culmen 1·40; tarsus 0·47.

Female nearly similar to the male, but usually with the central tail-feathers less elongated and attenuated.

Young birds are duller in colour throughout, the crown is green washed with brown, the back and wings green, the black throat band is absent and the central tail-feathers are not produced.

Distribution.—The European Bee-Eater is found during the northern summer breeding throughout southern Europe and central Asia, from Spain to Kashmir and the Altai Mountains. It passes through northern and central Africa on migration, and winters in southern Africa from October to March, where it also breeds. It is widely spread over the whole of South Africa during three months, between Cape Town, Durban, and the Zambesi.

The following are recorded localities: Cape Colony—Cape div. October (S. A. Mus.), Malmesbury, November (S. A. Mus.), Oudtshoorn, January (Victorin), Beaufort West, January (S. A. Mus.), Orange river, near Aliwal North (Whitehead), Griquatown, December (Burchell), Kuruman, October (S. A. Mus.); Natal—near Durban, April (Shelley); Transvaal—Lydenburg, January (Francis in S. A. Mus.), Rustenburg and Potchefstroom, October, March (Ayres); Bechuanaland—near Bamangwato, October (Oates), Kanye (Exton); Rhodesia—Tati (Holub), near Inyati, December, and near Pandamatanka, December (Oates), Salisbury, November (Marshall); German south-west Africa—Omaruru, January, February (Eriksson in S. A. Mus.), Ondonga (Andersson); Portuguese East Africa—below Zumbo on the Zambesi, October (Alexander).

Habits.—The European Bee-Eater is only found in South Africa during the southern summer, and unlike most of the other migrants from northern latitudes, breeds during its stay here. Whether the same individuals which have already bred in Southern Europe earlier in the year do so a second time here, or whether only a small proportion, which have perhaps not had an opportunity of doing so in Europe, breed here is not known, and this would doubtless be a

difficult problem to solve. The Bee-Eaters usually arrive in October in flocks, which then scatter over the country. They are generally noticed near farms where there are hives of bees, or among the mountain valleys where there are wild bees, as these form their chief food. They also prey on wasps, flies, and other insects which they catch in the air when hawking round, or sometimes watch for while perched on a post or twig; the bees and other stinging insects are very skilfully seized across the body, squeezed and then swallowed. These birds fly well and swiftly; they are often seen soaring at a considerable height, and when circling around, they utter a cheerful chirruping note like that of a house-martin, but somewhat louder.

The European Bee-Eater was first noticed to breed in South Africa by Mr. Henry Jackson at Nelspoort, near Beaufort West. Subsequently Mr. Layard found them nesting on the Berg river, and recently Mr. Marshall has stated that they breed in Mashonaland; while on October 27 of the present year (1901) a pair were seen and an egg was taken at Klipfontein on the Cape Flats, about twelve miles from Cape Town, by Mr. W. G. Fairbridge. A nest with eggs was lately taken by Mr. Griffin also from near the Berg River on November 11. The nest-hole was in the perpendicular bank of a narrow sluit or ditch running through a garden on Mr. Kotze's farm. One side of the sluit was occupied by Sprews (*Spreo bicolor*), the other by the Bee-Eaters; the nest-holes ran inwards horizontally for about three feet, and then sloped somewhat downwards for about the same distance and ended in a rounded chamber. There was no nest, but the floor of the chamber was covered with the hard, chitinous portions of the bees on which the Bee-Eaters fed, and which had been thrown up in the form of castings. The eggs, five in number, are rounded and glossy white, and average 1.05×0.87 . The nest-holes are not always made in a perpendicular bank, but often in sloping or even flat ground, and there are generally a considerable number of pairs breeding together in one locality.

406. **Merops persicus.** *Blue-cheeked Bee-Eater.*

Merops persicus, Pallas, *Reis. Russ. Reichs*, ii, *Anhang*, p. 708 (1773); Dresser, *Monogr. Merop.* p. 63, pl. 16 (1884); Ayres, *Ibis*, 1885, p. 343 [Vaal R.]; Sharpe, *Cat. B. M.* xvii, p. 66 (1892); Shelley, *B. Afr.* i, p. 111 (1896); Woodward Bros. *Natal B.* p. 90 (1899); Alexander, *Ibis*, 1900, p. 97 [Zambesi].

Merops ægyptius, *Forsk. Descr. Anim. Aves*, p. 1 (1775); *Layard, B. S. Afr.* p. 69 (1867); *Gurney, Ibis*, 1868, p. 154.

Merops savignii, *Audouin, Expl. Somm.* p. 371 (1825); *Gurney, Ibis*, 1861, p. 132 [Natal]; *Kirk, Ibis*, 1864, p. 324 [Zambesi]; *Layard, B. S. Afr.* p. 69 (1867); *Holub & Pelz. Orn. Süd-Afrikas*, p. 65 (1882).

Merops superciliosus (*nec Linn.*), *Gurney in Andersson's B. Damara-land*, p. 61 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 97, 804 (1875-84); *Barratt, Ibis*, 1876, p. 197 [Vaal R.]; *Oates, Matabele-land*, p. 301 (1881).

Description. *Adult male.*—General colour above, bright green, a few white frontal feathers; wings like the back, outer wing-coverts bluish, the quills olive-green with black tips; tail olive-green, the two centre feathers elongated and narrowed to a point and black; lores, feathers round the eye and ear-coverts black, above this the eyebrow, and below the cheeks cobalt-blue; below, the chin is yellow, the throat chestnut, the rest of the lower surface green; under wing-coverts and under side of the quills and axillaries pale chestnut.

Iris crimson; bill black; legs and feet dark brown.

Length to outer tail-feathers 10·5; wing 6·1; tail 3·7; to tips of central tail-feathers 6·0; culmen 1·70; tarsus 0·50.

The female resembles the male; the young bird is paler and less brightly coloured and is without the elongated central tail-feathers.

Distribution.—This bird like the European Bee-Eater also appears to be migratory, spending the northern summer and breeding in south-western Asia as far as Turkestan and the north-west provinces of India and being occasionally found in southern Europe. During the northern winter it is found throughout Africa, from Egypt to Cape Colony. Although by no means common it appears to be widely spread throughout our area between November and April. The following are recorded localities: Cape Colony—Cape div. Febr. (Layard), Griqualand West, Febr. (Holub); Natal—Durban (Brit. Mus.), Illovo, near Durban (Woodward); Transvaal—Vaal river near Potchefstroom (Ayres); Rhodesia—Hendriks Vley, near Pandamatenka, December (Oates); German south-west Africa—Ondonga, November, December (Andersson); Portuguese east Africa—Tete (Kirk).

Habits.—These Bee-Eaters are large in size and appear, unless seen close and in certain lights, dull in colour. They may be often observed perched on reed-tops; like the European Bee-Eater, they hawk for insects on the wing and do not, like the Little Bee-Eater,

make short darts from a fixed perch. As is the case with other species their food consists of insects, chiefly small wasps; the note is harsh and grating. Like the European Bee-Eater this bird, though only found here during the summer as a migrant from the north, is yet known to breed. Kirk and Ayres have noted this on the Zambesi and Vaal rivers respectively, but the details given do not show any difference in this respect from the habits of other species.

Mr. Millar sends the following note regarding the occurrence of this bird near Durban: "The Blue-cheeked Bee-Eaters are migratory, generally appearing along the coast during the summer months in large flights, and when they discover suitable hunting ground will remain in the locality for some time; they may be seen perched on the reeds in the marshes or on twigs, diving to and fro in search of small flying insects. Neither their nest or eggs have come under my observation and it is doubtful whether they breed in this neighbourhood."

407. **Merops boehmi.** *Böhm's Bee-Eater.*

Merops boehmi, *Reichen. Journ. Ornith.* 1882, p. 233, pl. ii, fig. 2; *Sharpe, Cat. B. M.* xvii, p. 83 (1892); *Shelley, B. Afr.* i, p. 83 (1897); *Alexander, Ibis*, 1900, p. 97 [near Tete].

Merops dresseri, *Shelley, Proc. Zool. Soc.* 1882, p. 303, pl. xvi.

Description. *Adult.*—General colour above bright grass-green, including the scapulars and wing-coverts; the lower back, rump and upper tail-coverts slightly washed with blue; quills green, internally pale fawn-colour and tipped with blackish, the inner secondaries entirely green; tail-feathers green, with black shafts and tips; crown of head cinnamon-rufous or light bay; a line at the base of the forehead, lores, and a band through the eye to the ear-coverts black; cheeks and throat fawn colour, the former separated from the ear-coverts by a line of blue; remainder of under surface green; on each side of the vent a tuft of ashy feathers; under wing-coverts and lining of the quills fawn-colour (Sharpe).

Iris red.

Length 9·5; wing 3·14; tail 3·0, to end of centre tail feathers 5·7; tarsus 0·35; culmen 1·1.

Distribution.—This bird was first obtained in German east Africa, it is also found in Nyasaland and extends southwards to the Zambesi, on the southern bank of which river it was observed by Alexander, about sixty miles below Tete.

Habits.—Capt. Alexander found Böhm's Bee-Eater in little natural clearings in thick woods, and states that it is rather shy and retiring.

408. **Merops nubicoides.** *Carmine-throated-Bee-Eater.*

Merops nubicoides, *Desmurs & Pucheran, Rev. Zool.* 1846, p. 243; *Delagorgue, Voy. Afr. Austr.* ii, p. 505 (1847); *Kirk, Ibis*, 1864, p. 324 [Zambesi]; *Gurney in Andersson's B. Damaraland*, p. 62 (1872); *Ayres, Ibis*, 1874, p. 102; *Sharpe, ed. Layard's B. S. Afr.* pp. 99, 884, pl. 4, fig. 2 (1875-84); *Oates, Matabeleland*, p. 301 (1881); *Shelley, Ibis*, 1882, p. 242 [Umfuli River]; *Holub & Pelz. Orn. Süd-Afrikas*, p. 66 (1882); *Ayres, Ibis*, 1884, p. 223, 1885, p. 343 [Rustenburg]; *Dresser, Monogr. Merop.* p. 93, pl. 21 (1884).

Merops natalensis, *Reichenb. Handb. Merop.* p. 78, pl. 451 (1852); *Sharpe, Cat. B. M.* xvii, p. 84 (1892); *Shelley, B. Afr.* i, p. 111 (1896); *Woodward Bros. Natal B.* p. 90 (1899); *W. Sclater, Ibis*, 1899, p. 112 [Inhambane]; *Alexander, Ibis*, 1900, p. 97 [Zambesi]; *Sharpe, ibid.* p. 115 [near Beira]; *Marshall, ibid.* p. 248 [Mashonaland].

Merops nubicus (*nec Gmel.*), *Layard, B. S. Afr.* p. 69 (1867).
 "Inconyani" of the Matabeles (Ayres); and Swazis (Francis).



FIG. 24.—*Merops nubicoides.* $\times \frac{1}{4}$.

Description. *Adult male*.—Crown of the head a somewhat verdigris-green; mantle scapulars and wing-coverts crimson, wing-quills somewhat darker with black tips; the inner secondaries greenish at the ends; rump and upper tail-coverts bright cobalt-blue; tail dark crimson the two central feathers elongated and attenuated, the narrow portion being black; lores, feathers round the eye and ear-coverts black; below, bright cherry-pink, paler on the lower breast; abdomen and lower tail-coverts cobalt, under

wing-coverts and inner lining of the quills pale chestnut, rest of the quills and under side of the tail-feathers dusky.

Iris dark hazel; bill black; legs and feet ashy-brown.

Length to the outer tail-feathers 10·0; wing 5·9; tail 4·0; to end of central feathers 8·0; culmen 1·55; tarsus 0·5.

The female resembles the male; a young male in the South African Museum is duller coloured in every way, the crown is blue, and the crimson of the back and lower surface is replaced by a dull cinnamon-brown; the central tail-feathers are not elongated.

Distribution.—The Carmine-throated Bee-Eater was first described by Desmurs and Pucheran from specimens obtained by Delagorgue, apparently on the northern slopes of the Magaliesberg in what is now the Rustenburg district of the Transvaal. It is found along the valley of the Limpopo to the low country of the eastern Transvaal, Mashonaland and Portuguese east Africa, and along the valley of the Zambesi as far as the Okavango river. Beyond the Zambesi it has been met with only in Nyasaland, Angola, and the Upper Congo Districts. It is stated by Layard to have been once obtained by Verreaux at Genandendal, in the Caledon district of the Colony, and one specimen is noted in the British Museum Catalogue, as from Port Natal (*i.e.*, Durban); otherwise it is not known south of Rustenburg.

The following are recorded localities: Transvaal—Rustenburg, January (Ayres), Lydenburg district, January, February, May (Francis); Bechuanaland—Tebra Country, February (Eriksson in S. A. Mus.); Rhodesia—Daka river, and Geruah near Victoria Falls, January (Oates), Umfuli river, September (Ayres), Odzi river, Manicaland, November (Marshall); German south-west Africa—Okavango river (Andersson); Portuguese east Africa—Inhambane (Francis in S. A. Mus.), Senna to the Kufue on the Zambesi river (Alexander).

Habits.—This, which is perhaps the most beautiful bird in South Africa, is never found except along the rivers of the low country. It is apparently a migrant within our limits, arriving in about October and November, and leaving again in March, and breeding during its stay here. It generally perches on the outer branches of high trees and is a persistent high flyer. Marshall and Francis both state that the easiest way to get it down within reach is to set on fire a patch of grass. This at once attracts the Bee-Eaters which descend in order to snap up the insects disturbed by the flames. Capt. Alexander gives a good account of this bird which

I here quote: "The reeds (of a little island in the middle of the Zambesi) were literally festooned with the bodies of Bee-Eaters and bending under their weight. Most of the birds were already asleep, and the reports of our guns threw them suddenly into confusion, many clinging to the reeds and hardly realising what had taken place. Soon a great sight met our eyes. Shaking themselves free of the reeds, these birds, some three hundred in number, and glorious in their feathered coats of scarlet, mounted in the air and were soon bathed in the last glows of a setting sun. They massed themselves together after the manner of starlings, making all the time a great noise in a single note closely resembling the cry of the fieldfare.

"Essentially river-birds, they never stray far from water. Dried up water-courses studded with pools, and flat reedy land interspersed with tall trees, are their resorts. During the heat of the day this Bee-Eater will remain for hours inert being quite indifferent to a near approach; towards evening the bird wakes up from its lethargy and takes a post close to the river side, whence it skims over the smooth water after insects, often striking the surface so as to send up a cloud of spray."

On November 1, not far from Zumbo, we came across a nesting station of this species. The holes, which were very numerous, were in a steep portion of the river's bank; they ran very deep into the bank, about three feet in, and we had no appliances for digging them out.

Mr. Andersson also states that this species breeds on the Okavango but gives no details.

Genus II. DICROCERCUS.

Type.

Dicrocercus, *Cab. & Heine, Mus. Hein.* ii, p. 136

(1863)D. *hirundineus*.

Bill and head as in *Merops*; wings pointed; the secondaries falling short of the primaries by a considerable amount, the first primary about half the length of the second; tail forked, the outer tail-feathers a good deal longer than the central ones. This is a purely African genus and contains only two closely allied species.

409. **Dicrocercus hirundineus.** *Swallow-tailed Bee-Eater.*

Merops hirundineus, *Lichtenstein, Cat. rer. nat. rariss.* p. 21 (1793).

Merops hirundinaceus, *Vieill. N. Dict. H. N.* xiv, p. 21 (1817); *Layard, B. S. Afr.* p. 70 (1867); *id. Ibis*, 1869, p. 72.

Dicrocercus hirundinaceus, *Gurney in Andersson's B. Damaraland*, p. 63 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 101, 805 (1875-84); *Ayres, Ibis*, 1878, p. 285 [Potchefstroom]; *Oates, Matabeleland*, p. 302 (1881); *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 66 (1882); *Marshall, Ibis*, 1900, p. 247 [Salisbury].

Dicrocercus hirundineus, *Dresser, Monogr. Merop.* p. 99, pl. 22 (1884); *Sharpe, Cat. B. M.* xvii, p. 43, pl. i, fig. 1 (1892); *Shelley, B. Afr.* i, p. 110; *Sowerby, Ibis*, 1898, p. 571 [Fort Chiquaqua].

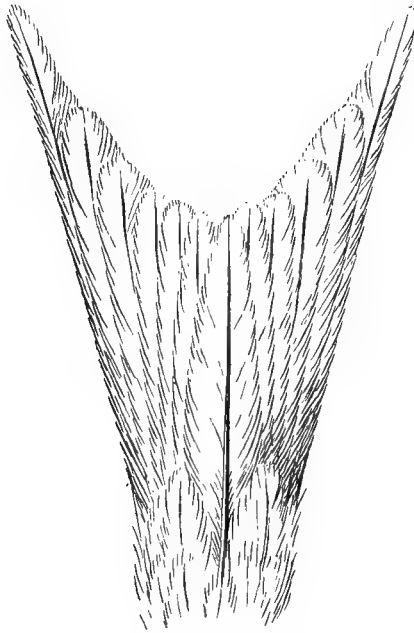


FIG. 25.—Tail of *Dicrocercus hirundineus*. $\times \frac{7}{8}$.

Description. *Male.*—Above, a bright golden-green; primaries and inner secondaries a faint chestnut edged with green and tipped with black; rump and upper tail-coverts cobalt-blue, tail-feathers a little duller blue, the outer ones slightly washed with green, all

except the central ones dusky subterminally and white at the tips ; below, like the back, chin and throat a bright yellow, followed by a narrow transverse band of bright blue ; a black band through the eye extending over the ear-coverts ; under wing-coverts and under surface of the quills pale chestnut, under tail-coverts cobalt ; under surface of tail dusky.

Iris crimson ; bill black ; legs and feet brown.

Length 8·75 ; wing 3·80 ; tail 2·8, to end of outer tail-feather 4·0 ; culmen 1·10 ; tarsus 0·30.

The female resembles the male, but is slightly smaller ; wing 3·70.

Young birds have no yellow or blue on the throat, though the tail is forked throughout life.

Distribution.—From the valley of the Orange River and Natal northwards throughout Bechuanaland, the Transvaal, Rhodesia, and German south-west Africa, but everywhere a somewhat scarce bird. North of the Zambesi it occurs in Angola, Nyasaland, and German east Africa, but is replaced in west and north-east Africa by another though closely allied species.

The following are localities : Cape Colony—Upington on the Orange River (Bradshaw), Colesberg (Ortlepp) ; Natal (British Museum) ; Transvaal—Potchefstroom (Ayres) ; Bechuanaland—Bamangwato (Holub), Lake Ngami (Chapman) ; Rhodesia—Panda-matenka, near Victoria Falls (Oates), Salisbury (Marshall), Ft. Chiquaqua (Sowerby) ; German south-west Africa—Otjimbingue (Andersson), Omaruru (Eriksson).

Habits.—The Swallow-tailed Bee-Eater is a resident bird in most of the localities where it occurs, though Andersson found it more numerous in Damaraland in the rainy season.

Everyone remarks it as a rare bird, generally seen singly or in pairs. Unlike other Bee-Eaters it is often found far away from water, generally perched on low trees or bushes in open spaces in forest. As is the case with all this group of birds the food consists of insects of various kinds, blue-bottles, grasshoppers, and hymenoptera have been noted ; these are usually caught on the wing, though sometimes taken from leaves and flowers. These Bee-Eaters hawk over trees in search of their prey, but do not fly so high as other species.

The only observations on the nesting habits of this species are by Andersson, he found a nest on the Omaruru river on October 31. It was at the end of a horizontal passage, about three feet long, in

a soft sandy bank, the hole was slightly enlarged at the end and the eggs laid there without any nest-lining; these were three in number and pure white.

Genus III. **MELITTOPHAGUS.**

Type.

Melittophagus, *Boie, Isis*, 1828, p. 316 *M. pusillus*.

Bill and head as in *Merops*; wings somewhat rounded, the secondaries equal to or surpassing the primaries in length; first primary about half the length of the second, which is the longest; tail square, neither the inner nor outer feathers elongated. This genus is spread over Africa and southern Asia as far as the Malayan Islands and contains about fourteen species, two of which are resident in South Africa.

Key of the Species.

- A. Throat yellow, bordered below by a black band *M. meridionalis*, p. 67.
 B. Chin white, throat carmine-red *M. bullockoides*, p. 70.

410. **Melittophagus meridionalis.** *Little Bee-Eater.*

Melittophagus erythropterus (nec Gmel.), *Gurney, Ibis*, 1862, p. 27 [Natal].

Merops variegatus (nec Vieill.), *Kirk, Ibis*, 1864, p. 324 [Zambesi].

Merops erythropterus, *Layard, B. Afr.* p. 70 (1867).

Melittophagus pusillus (nec Mull.), *Ayres, Ibis*, 1871, p. 150 [Limpopo]; *Gurney in Andersson's B. Damaraland*, p. 62 (1872); *Shelley, Ibis*, 1882, p. 242 [Umfuli River].

Merops pusillus, *Buckley, Ibis*, 1874, p. 363 [Semokwe River]; *Sharpe, ed. Layard's B. S. Afr.* pp. 100, 805 (1875-84); *Barratt, Ibis*, 1876, p. 197 [Rustenburg]; *Ayres, Ibis*, 1879, p. 290 [Rustenburg]; *Oates, Matabeleland*, p. 301 (1881).

Melittophagus minutus, *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 67 (1882).

Melittophagus meridionalis, *Sharpe, Cat. B. M.* xvii, p. 45, pl. i, fig. 4 (1892); *Distant, Transvaal*, p. 166 (1892); *Shelley, B. Afr.* i, p. 110 (1896); *Sharpe, Ibis*, 1897, p. 496 [Zululand]; *Sowerby, Ibis*, 1898, p. 571 [Ft. Chiquaqua]; *Woodward Bros. Natal Birds*, p. 88 (1899); *Alexander, Ibis*, 1900, p. 96 [Zambesi]; *Marshall, ibid.* p. 248 [Mashonaland]; *Reichenow, Ornith. Monatsb.* viii, p. 87 (1900).

Melittophagus cyanostictus, *Sharpe, Ibis*, 1900, p. 115 [nr. Beira].

“Iguondwana” of Zulus (Woodward).

Description. *Adult male.*—General colour above, bright green, wing-quills, including the wing-coverts, scapulars and inner secondaries, pale chestnut tipped with black, the tips becoming more marked towards the inner feathers of the wing; central pair of tail-feathers green like the back, the others pale chestnut with well-marked subterminal black spots and ashy-green tips; a narrow eyebrow cobalt-blue, ear-coverts black; chin and throat yellow, separated from a broad black chest band by a narrow line of blue, the black band is margined behind by chestnut, which pales on the rest of the lower surface into an orange-fawn colour; under wing- and tail-coverts pale fawn.

Iris crimson in adults, hazel in young; bill black; legs and feet dusky.

Length about 6.40; wing 3.10; tail 2.50; culmen 0.85; tarsus 0.35.

The female resembles the male in colour but is a little smaller, wing 2.90. A young bird is without the blue eyebrow or the black and blue throat bands, and the breast and upper abdomen are pale green.

Distribution.—The Little Bee-Eater has not been obtained within the boundaries of the Colony, but is common in Natal, the Transvaal, Portuguese east Africa, Rhodesia, northern Bechuanaland, and Ovampoland, and is a resident throughout the year. Beyond our limits it ranges through Angola to the lower Congo, to Uganda, Nyasaland, and German east Africa. In west and north-east Africa it is replaced by closely allied species.

Localities in South Africa are: Natal—Durban, Pinetown, Newcastle (Brit. Mus.), Eshowe, and Ulundi (Woodward); Transvaal—Lydenburg (Francis, S. A. Mus.), Pretoria (Distant), Rustenburg and Limpopo river (Ayres); Bechuanaland—Lake Ngami (Andersson), Kanye (Exton); Rhodesia—Tati (Oates), Semokwe river (Buckley), Quae Quae river (Ayres), Salisbury district (Marshall); German south-west Africa—Okavango river (Andersson); Portuguese east Africa—Beira district (Cavendish), Tete (Kirk).

Habits.—The Little Bee-Eater is generally found in small companies of from three to five individuals, and is seldom or never very far from water. They generally perch on the outer twigs of low bushes, or on reeds, whence they make frequent excursions after passing insects, returning at once to their resting places, resembling much in this respect the Spotted Flycatcher; they very seldom hawk

after their prey. They appear to be, at any rate in Natal, residents and not migratory.

The following extract is from Dr. Stark's notebook. "December 15, Pinetown, Natal. Saw a single *Merops pusillus* sitting on the top of a dead reed in a marshy spot. In a low sandy bank near where the bird was sitting, and now and then taking short flights after insects, I found several small holes, and from one, about two feet deep, I extracted with a rush some wing cases and elytra of beetles. On digging down from above, I found the young, unfledged birds a few days old, and the remains of a delicate white-shelled egg. After restoring the hole and retiring a short distance, I for some time watched the Bee-Eater I had previously seen. He took up his station on the top of a low twig not many yards from the nest hole, and from thence made short flights after insects, returning to the same station. Occasionally during his sallies he would pass just in front of the nest hole. Once I heard a short note as he did so, but ordinarily these Bee-Eaters seem to be silent and unsocial birds. They never seem to hawk for prey like *Merops apiaster*, but take a short sally of a few yards from their station on the top of a reed or twig, returning to the same spot continually. They throw up the hard, indigestible part of their insect-prey in the form of casts, shaking their head violently from side to side while doing so (like owls). The chamber at the end of the nest hole is in consequence lined with the remains of wing cases of beetles and other hard parts of insects. A week later I again watched the same nest. One of the birds was sitting in the usual place on the top of a low bush some fifteen or twenty yards off. It was probably the female; it displayed little or no alarm at my presence, but continued catching its insect prey and carrying food to its young. It entered the nest hole fourteen times in fifteen minutes, only staying in a few seconds. The male appeared and sat on the same sprig as the female at the end of thirteen minutes, and during the remaining two minutes fed the young twice alternately with the female, so that when both birds are at work the young are fed at intervals of half a minute. I noticed one bird catch a white butterfly, but small coleopterous insects seem to form the chief part of their prey. Whilst seated on their perches they turn their heads from side to side constantly."

The eggs of this species were found by Ayres on October 20, on the Quae Quae river in Mashonaland.

A clutch of four obtained at Sydenham, near Durban, on October 11 by Mr. Millar are now in the South African Museum;

they are round ovals, pure glossy-white, and average 0.75×0.60 in measurement.

Mr. Millar further informs me that this bird often builds in a hole excavated in an ant-bear's earth, and that on one occasion when digging out such a nest, he found fourteen eggs of the large and very poisonous mamba snake (*Dendraspis angusticeps*) lying on the top of the four Bee-Eater's eggs, all stuck together, the snake having deposited its eggs upon those of the bird; and further that on another occasion some years previously, his brother actually found a six-foot mamba itself coiled up inside a Bee-Eater's nest. The snake was found to contain a quantity of ripe eggs, and had evidently entered the hole to deposit them there.

411. **Melittophagus bullockoides.** *White-fronted Bee-Eater.*

Merops bullockoides, *Smith, S. Afr. Quart. Journ.* (2) ii, p. 320 (1834); *id. Ill. Zool. S. Afr. Aves*, pl. 9 (1838); *Kirk, Ibis*, 1864, p. 324; *Layard, B. S. Afr.* p. 70 (1867); *Buckley, Ibis*, 1874, p. 363 [Limpopo]; *Sharpe, ed. Layard's B. S. Afr.* pp. 99, 804, pl. 4, fig. 1 (1875-84); *Barratt, Ibis*, 1876, p. 197 [Rustenburg]; *Ayres, Ibis*, 1879, p. 289 [Rustenburg]; *Oates, Matabeleland*, p. 301 (1882).

Spheconax albifrons, *Cab. & Heine, Mus. Hein.* ii, p. 133 (1860).

Melittophagus bullockoides, *Ayres, Ibis*, 1871, p. 150; *Shelley, Ibis*, 1882, p. 242 [Hanyani River]; *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 68 (1882); *Dresser, Monogr. Merop.* p. 129 (1885); *Shelley, B. Afr.* i, p. 111 (1896); *Alexander, Ibis*, 1900, p. 96 [Zambesi].

Melittophagus albifrons, *Sharpe, Cat. B. M.* xvii, p. 53 (1892); *id. Ibis*, 1897, p. 496 [Zululand]; *Woodward Bros. Natal Birds*, p. 89 (1899); *Sharpe, Ibis*, 1900, p. 115 [Beira distr.].

"Inkota" of Zulus.

Description. *Male.*—General colour above, green, the forehead hoary-white with slight brown shaft marks, the crown tinged cobalt, and the nape of the neck cinnamon, this latter being continued round to the breast; wings green, the primary quills tinged with black at the tip, the secondaries with distinct black tips; upper tail-coverts ultramarine; tail-feathers green like the back; lores, feathers round the eye and ear-coverts black, below which is a narrow white band, meeting its fellow on the other side at the chin; throat bright carmine; breast and under wing-coverts cinnamon, shading through green into the bright ultramarine under tail-coverts.

Iris dark hazel; bill black; legs and feet greenish-black.

Length 9.0; wing 4.40; tail 3.75; culmen 1.35; tarsus 0.45.

The female resembles the male, the young are duller coloured throughout, especially on the tail-coverts and throat.

Distribution.—The White-fronted Bee-Eater was first discovered by Sir A. Smith, “north of 25° S. lat.,” probably on the upper waters of the Limpopo; thence it is spread over the greater part of the low country of the Transvaal and Zululand to Natal where it is rare, and in the other direction to Mashonaland and the Zambesi; beyond our limits it has been obtained in Angola, Nyasaland, and German and British east Africa as far north as Lake Naivasha.

South African localities are: Natal—Isipingo near Durban, Howick near Maritzburg, Ulundi and the Black Umvolosi river in Zululand (Woodward); Transvaal—Lydenburg dist. (Francis, S. A. Mus.), Potchefstroom and Rustenburg (Barratt); Rhodesia—Hanyani river (Ayres); Portuguese east Africa—Beira dist. (Cavendish), Zambesi river (Kirk and Alexander).

Habits.—The White-fronted Bee-Eater appears to resemble the preceding species, the Little Bee-Eater, in its habits; it is never seen very far from water or streams, where it is found solitary or in pairs, perched on a twig on the look out for insects; its note is said to be harsh and short. In the evening the birds congregate to roost on ledges formed along the perpendicular sand banks which are often found covered with their castings of beetle wings. Alexander also found them roosting in companies on the tops of high leafless trees along the Zambesi. They make deep nest-holes in the sand banks where they roost, but I have not met with any more exact description of their breeding habits. This Bee-Eater like the preceding, appears to be a resident in the localities where it is found.

Family III. ALCEDINIDÆ.

Bill long, stout and pointed, the culmen slightly ridged or flattened; tarsi and toes feeble; arrangement of toes syndactyle, the fourth toe united to the third for the greater part of its length, the second united to the third for its basal third, the hallux or first toe alone turned backwards (see fig. 26, p. 73). Primaries eleven, the first minute; tail-feathers twelve in all South African forms; spinal feather-tract well defined on the neck and not forked on the back; oil gland tufted; no cæca.

Kingfishers, which are spread over the whole of both hemispheres, all lay white, generally glossy and rounded eggs, in a chamber formed at the end of a burrow which is usually placed in a sand bank; no nest lining is formed, but the accumulation of pellets, chiefly fish bones, form a resting place for the eggs and young.

Two subfamilies are recognised by Dr. Bowdler Sharpe, to whom we are indebted for an excellent monograph of the group, but the distinctions between them are not well marked.

Key of the Genera.

- A. Tail longer than the culmen.
 a. Bill long and slender about five times as long as broad at the nostrils; plumage black and white *Ceryle*, p. 72.
 b. Bill shorter, about three times as long as broad at the nostrils; plumage varied generally with blue *Halcyon*, p. 85.
 B. Tail shorter than the culmen.
 a. Bill long and slender, culmen ridged.
 a¹. With only a short crest on the nape..... *Alcedo*, p. 78.
 b¹. With a long crest, the feathers of the crown extending beyond the occiput *Corythornis*, p. 81.
 b. Bill shorter, culmen rounded; no crest *Ispidina*, p. 83.

Genus I. **CERYLE.**

Type.

Ceryle, *Boie, Isis*, 1828, p. 310 *C. rudis*.

Bill long, strong and compressed, culmen rounded, marked off on either side from the rest of the bill by a groove; wings somewhat pointed, the first primary but little shorter than the second, third and fourth, which are the longest; tail longer than the bill; plumage somewhat sombre, prevailing colours black and white, no bright blue; sexes differing from one another.

This genus is spread over the whole of Africa, western Asia and the Indian region as far as China and Japan; it also inhabits the whole of America; about ten species are recognised, three of these are African, and two come within our limits.

Key of the Species.

- a. Smaller, wing under 6·0; plumage black and white *C. rudis*, p. 73.
 b. Larger, wing over 7·0; part of the lower surface rufous..... *C. maxima*, p. 76.

412. *Ceryle rudis*. Pied Kingfisher.

Alcedo rudis, *Linn. Syst. Nat.* 12th ed. i, p. 181 (1766).

Ceryle rudis, *Boie, Isis*, 1828, p. 316; *Grill, K. Vet. Akad. Handl. Stockholm*, ii, no. 10, p. 46 (1858) [Knysna]; *Gurney, Ibis*, 1859, p. 245 [Natal]; *Kirk, Ibis*, 1864, p. 325; *Layard, B. S. Afr.* p. 67 (1867); *Ayres, Ibis*, 1869, p. 290 [Limpopo]; *Sharpe, Monogr. Alced.* p. 61, pl. 19 (1871); *Gurney in Andersson's B. Damaland*, p. 59 (1872); *Buckley, Ibis*, 1874, p. 364 [Limpopo]; *Shelley, Ibis*, 1875, p. 69; *Sharpe, ed. Layard's B. S. Afr.* pp. 110, 807 (1875-84); *Ayres, Ibis*, 1880, p. 262 [Potchefstroom]; *Oates, Matabeleland*, p. 303 (1881); *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 64 (1882);



FIG. 26.—Foot of *Ceryle rudis*. $\times \frac{1}{4}$.

Butler, Feilden, and Reid, Zool. 1882, p. 206 [Natal]; *Shelley, Ibis*, 1882, p. 244 [Mashonaland]; *Symonds, Ibis*, 1887, p. 327 [Kroonstad]; *Sharpe, Cat. B. M.* xvii, p. 109 (1892); *Shelley, B. Afr.* i, p. 115 (1896); *Sharpe, Ibis*, 1897, p. 497 [Zululand]; *Woodward Bros. Natal B.* p. 90 (1899); *Alexander, Ibis*, 1900, p. 103 [Zaambesi]; *Marshall, ibid.*, p. 248 [Mashonaland]; *Woodward Bros. ibid.*, p. 520 [St. Lucia Lake].

“Isqula” of Natal Zulul.

Description. *Male*.—General colour black and white, the crown, which is crested, black slightly streaked with white; nape white forming a collar; feathers of the mantle, wing- and tail-coverts tipped and often edged with white; primary quills with the basal halves, tips and sometimes the external edge white, the rest black; secondaries also black and white; tail with the basal half and tip white, and a broad subterminal band of black; lores a spot below the eye and a streak above the ear-coverts white, feathers in front of the eye and ear-coverts black; below white with a broad band

narrowed in the middle across the breast, and a much narrower one across the lower breast, both black, flanks mottled with black spots.

Iris dark brown ; bill, legs and feet black.

Length in flesh 11·5, in skin about 11·0 ; wing 5·55 ; tail 3·0 ; culmen 2·5 ; tarsus 0·40.

The female differs from the male in not possessing the second pectoral band ; the front band too is generally more divided in the middle ; wing 5·40 ; culmen 2·20.

Breeding birds are usually darker owing to the wearing away of the white margins to the feathers ; young birds have the pectoral bands somewhat ashy and the feathers of the throat and neck edged with dusky.

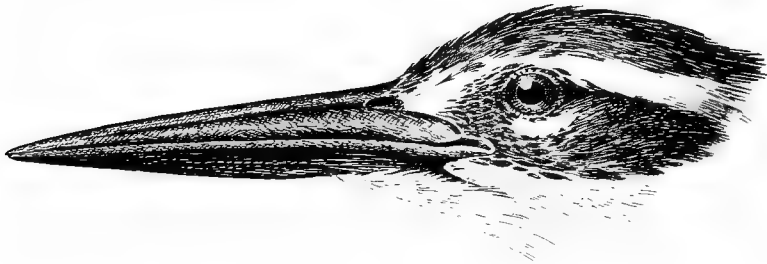


FIG. 27.—*Ceryle rudis*.

Distribution. — This is a widespread species, being found throughout Africa and south-west Asia as far as the Persian gulf ; beyond this in India and southern China it is replaced by another sub-species, only differing from it in minor points. In South Africa it is one of the commonest of Kingfishers, being found everywhere where suitable conditions exist, from the neighbourhood of Cape Town and Durban to the Zambesi. The following are localities : Cape Colony—the Cape, Malmesbury, Worcester, Paarl, Caledon, Bredasdorp, Oudtshoorn, Knysna, Port Elizabeth, Peddie, East London, Pondoland, Colesberg, Barkly West, Gordonia, and Bechuanaland divisions ; Natal—near Durban, Escourt, Colenso, and Newcastle ; Zululand ; Orange River Colony—Kroonstad ; Transvaal—the Potchefstroom and Rustenburg districts ; Rhodesia—Umswesi, Umfuli, and other rivers in Mashonaland ; German south-west Africa—Great Namaqualand, and perhaps Damaraland ; Portuguese east Africa—Tete.

Habits.—The Pied Kingfisher is only found in the neighbourhood of water, whether that of rivers, lakes, lagoons, or even that of the open sea, where it is not infrequently to be seen fishing among the breakers. This bird, unlike other Kingfishers, does not dive from a fixed perch, but hovers over the water before



FIG. 28.—*Ceryle rudis*. (From a photograph from life taken by Mr. H. E. Harris.)

darting on a fish, often at a height of 15 or 20 feet above the surface; when thus hovering the head and tail are bent downwards at an angle, the beak pointing vertically downwards; in this position they poise with quick beats of the wings. As soon as a fish is sighted the wings are nearly, but not quite, closed, and the bird falls headlong down on to its victim, sending up spray and

striking the water with a thud, and often completely disappearing under the surface. It repeats this manœuvre quite rapidly, at intervals of about a minute. It not infrequently misses its mark, but it goes on most persistently until its patience is rewarded. Unlike other Kingfishers these birds are bold and noisy. Their food consists almost entirely of fishes, but shrimps and crabs are also occasionally resorted to.

The nest-hole is made in the side of a sand bank, and usually runs horizontally inwards for about three or four feet, at the end of which is a smooth, rounded chamber; no lining is used, but a mass of fish-bones and scales accumulates there, probably from the castings of the birds; on these are laid five (sometimes six) white, oval, shining eggs, measuring 1.25×0.95 . Mr. Layard first found a nesting place at Zoetendals Vley, in the Bredasdorp division, on November 10; Buckley found it breeding on the Limpopo, and lately Mr. Griffin had taken a nest on the great Berg river on November 15, containing five fresh eggs.

413. *Ceryle maxima*. Giant Kingfisher.

- Alcedo maxima*, Pallas, *Spic. Zool. fasc. iv*, p. 14 (1769).
Ceryle maxima, Gray, *Gen. B. i*, p. 82 (1847); Grill, *K. Vet. Akad. Handl. Stockholm ii*, no. 10, p. 47 (1858); Gurney, *Ibis*, 1859, p. 243 [Natal]; Kirk, *Ibis*, 1864, p. 325 [Zambesi]; Layard, *B. S. Afr. p. 66* (1867); Ayres, *Ibis*, 1869, p. 290 [Marico]; Sharpe, *Monogr. Alced. p. 67*, pl. 20 (1869); Gurney in Andersson's *B. Damaland*, p. 59 (1872); Sharpe, *ed. Layard's B. S. Afr.* pp. 111, 807 (1875-84); Shelley, *Ibis*, 1875, p. 69 [near Durban]; Buckley, *Ibis*, 1876, p. 133 [Limpopo]; Ayres, *Ibis*, 1879, p. 291 [Rustenburg]; Oates, *Matabeleland*, p. 303 (1881); Shelley, *Ibis*, 1882, p. 244 [Mashonaland]; Butler, Feilden, and Reid, *Zool.* 1882, p. 206 [Umgeni River]; Ayres, *Ibis*, 1884, p. 223 [Rustenburg], 1885, p. 243 [Potchefstroom]; W. Ayres, *Ibis*, 1887, p. 50 [Zoutspansberg]; Symonds, *ibid.* p. 327 [Kroonstad]; Sharpe, *Cat. B. M.* xvii, p. 118 (1892); Shelley, *B. Afr. i*, p. 116; Sharpe, *Ibis*, 1897, p. 497 [St. Lucia Lake]; Woodward Bros. *Natal B.* p. 91 (1899); Alexander, *Ibis*, 1900, p. 103 [Zambesi]; Marshall, *ibid.* p. 249 [Mashonaland].
 "Isivuba" of Natal Zulus.

Description. *Male*.—General colour above black, darker on the head, rather more slaty on the back and wings, head crested; above everywhere, including the wings and tail, covered with round white spots, those of the tail arranged in regular order and almost form-

ing a series of transverse bars; a spot in front of the eye, a line of feathers from the base of the lower mandible, and the throat all white, rest of the side of the face and a line of spots on either side of the throat black; lower throat and breast rich rufous, abdomen and under tail-coverts white, spotted with black blotches, the spots almost forming bands on the flanks; axillaries and under wing-coverts white with a few black spots.

Iris very dark brown; bill black; legs and feet dark olive-brown.

Length about 17.0; wing 7.60; tail 4.80; culmen 3.30; tarsus 0.45.

In the female the upper part of the breast, which is rufous in the male, is white, profusely spotted with ashy so as to almost form a chest band; the lower breast, abdomen, axillaries under wing- and tail-coverts are rufous; the size is about the same. A young bird, probably a male, has a black band across the chest, the feathers of which are edged with pale rufous, the rest of the under surface white with a few rufous feathers, especially on the flanks.

Distribution.—The Giant Kingfisher is spread over the whole of Africa, from the Gambia and the White Nile, southwards, except in the forest region of the Congo and Gaboon, where it is replaced by a closely-allied species or geographical race. In South Africa, though widely distributed, it nowhere seems to be common. The following are localities: Cape Colony—Cape, Stellenbosch, Ceres, Worcester, Caledon, Bredasdorp, Oudtshoorn, Knysna, Graaff Reinet, Port Elizabeth, East London and Pondoland divisions; Natal—Umgeni River, near Durban (Reid), Pinetown (Stark), St. Lucia Lake, in Zululand (Woodward); Orange River Colony—Kroonstad (Symonds); Transvaal—Lydenburg district (Francis, in S. A. Mus.), Zoutspansberg district (W. Ayres), Rustenburg and Potchefstroom (T. Ayres); Rhodesia—Matangwe river near Bulawayo, Chobe river (Holub), Umfuli river (Marshall); German south-west Africa—Okavango river (Andersson); Portuguese east Africa—Zambesi river (Kirk and Alexander).

Habits.—This, the largest of African Kingfishers, is found along rivers and even on the sea-beach, but is nowhere numerous and is always somewhat shy and wary. Layard states that it is migratory in the Colony; if this is so its migrations can only be of small extent, as it has been obtained in the south-western districts in nearly all the months of the year, and it is also a resident in Natal.

This bird is somewhat sociable, three or four being often found together; they are very noisy, chattering and screaming loudly over their fishing, which they conduct in much the same fashion as the Pied Kingfisher; they do, however, not appear to be so particular in their diet, crabs, frogs and reptiles as well as fishes being equally relished. The first observer to notice their breeding habits appears to be Mr. Walter Ayres who gives the following account:—“One of their nests was discovered by my Boer driver in a perpendicular bank of a little stream running into the Letaba (in the Zoutspansberg district of the Transvaal) at the drift; it was in a hole about four feet from the top of the bank, and, from below, a man standing in the water up to his middle could just reach it. The place was an awkward one to get at, especially as there were crocodiles about; however, my driver and a Kaffir, by digging with a spade to a considerable depth managed to get the nest. The Boer put his arm into the hole and felt the eggs; he also felt the old bird, not sitting on the eggs but a little to one side, where it remained and allowed itself to be caught. This proved to be the male bird. The eggs were four in number and white.” This nest was found in August. Mr. Marshall also found a nest in September on the Umfuli river in Mashonaland.

Genus II. **ALCEDO.**

Type.

Alcedo, *Linn. Syst. Nat.* 12th ed. i, p. 178 (1766)*A. ispida*.

Bill long and compressed, the culmen, which is marked off by a slight groove, rounded and not flattened, head slightly crested; wing pointed, the third and fourth primaries the longest; tail very short and rounded, shorter than the culmen; hallux and inner toe approximately equal; always with metallic-blue on the back; sexes more or less alike. This genus is found throughout the Old World except Australia and Polynesia. Three species inhabit Africa, only one of which is found within our limits.

414. **Alcedo semitorquata.** *Half-collared Kingfisher.*

Alcedo semitorquata, *Swains. Zool. Illustr.* iii, pl. 151 (1823); *Grill, K. Vet. Akad. Handl. Stockholm*, ii, no. 10, p. 46 (1858) [Knysna]; *P. L. Sclater, P. Z. S.* 1866, p. 22 [Windvogelberg]; *Layard, B. S. Afr.* p. 65 (1867); *id. Ibis*, 1869, p. 364; *Sharpe, Monogr. Alced.* p. 27, pl. 7 (1869);



FIG. 29.—*Alcedo semitorquata*.

Gurney in Andersson's B. Damaraland, p. 58 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 107, 806 (1875-84); *Ayres, Ibis*, 1879, p. 291 [Rustenburg]; *Shelley, Ibis*, 1882, p. 244 [Mashonaland]; *Butler, Feilden, & Reid, Zool.* 1882, p. 206 [Newcastle dist.]; *Sharpe, Cat. B. M.* xvii, p. 153 (1892); *Rendall, Ibis*, 1896, p. 167; *Shelley, B. Afr.* i, p. 116 (1896); *Sharpe, Ibis*, 1897, p. 497 [Eshowe]; *Woodward Bros. Natal B.* p. 91 (1899); *Marshall, Ibis*, 1900, p. 249 [Umfuli river].
Alcedo quadibrachys, (*nec Bp.*) *Gurney, Ibis*, 1859, p. 245, 1873, p. 258. "Blauw Vischvanger" of Dutch.

Description. Male.—Crown and nape dark blue banded with brighter blue; sides of the head above the ear-coverts a rich bright blue; mantle, rump and upper tail-coverts cobalt-blue; scapulars and wings a duller more greenish shade with brighter tips to the coverts; wing-quills dusky, edged with greenish-blue; tail-feathers bright blue; lores black with a yellowish-white spot above, ear-coverts pale fulvous, cheeks greenish-blue; throat white, rest of the lower surface and under wing-coverts fulvous; on either side of the breast a blue patch.

Iris and bill black; legs and feet bright red.

Length about 7·0; wing 3·20; tail 1·4; culmen 1·70; tarsus 0·4.

In the female the base of the lower mandible is red; the young bird is greener in colour and the feathers on the chest are tinged with black forming a slight barring.

Distribution.—This little Kingfisher is found throughout the southern and eastern portions of South Africa from Cape Town to Mashonaland, but does not seem to extend to the high central plateau and drier western portion of our area. Beyond the Zambesi it ranges through Nyasaland and East Africa as far north as Abyssinia. The following are South African localities: Cape Colony—Cape, Swellendam, Knysna, Port Elizabeth, Albany, Bathurst, Peddie, Stockenström, Cathcart (*i.e.*, Windvogelberg), East London and Pondoland divisions; Natal near Durban (Brit. Mus.), Newcastle (Reid) and Eshowe in Zululand (Woodward); Transvaal—Barberton (Rendall), Rustenburg (Ayres); Rhodesia—Umfuli river (Ayres and Marshall).

Habits.—This bird appears to resemble other Kingfishers in its habits; it is found along rivers and sometimes on the seashore, where it obtains the small fishes or sometimes crabs which form its diet; it darts on its prey from a fixed perch and does not hover like the Pied Kingfisher; it has a shrill but not unpleasant cry.

The Woodwards state that it adopts the burrow of a rat or other rodent in a hard bank in which to lay its eggs, but they give no further details. Mr. W. Atmore states that it lays three white polished eggs in a hole in a river bank.

Genus III. **CORYTHORNIS.**

Type.

Corythornis, *Kaup, Fam. Eisv.* p. 10 (1848) *C. galerita*.

This genus differs from *Alcedo* in having a much longer crest, the anterior feathers of which reach to beyond the occiput; the wings too are a good deal more rounded, the difference between the length of the primaries and secondaries being less than the length of the tarsus. In other respects it resembles *Alcedo*.

Three species are recognised, all confined to Africa, including Madagascar.

415. **Corythornis cyanostigma.** *Malachite Kingfisher.*

Alcedo cristata (*nec Linn.*), *Kittl. Kupf. Vög.* pl. 29, fig. 3 (1833); *Kirk, Ibis*, 1864, p. 325 [Zambesi]; *Layard, B. S. Afr.* p. 65 (1867).
Alcedo cyanostigma, *Rupp. Neue Wirb. Vög.* p. 70, pl. 24, fig. 2 (1835-40); *Grill, K. Vet. Akad. Handl. Stockholm*, ii, no. 10, p. 46 (1858).
Corythornis cristata, *Gurney, Ibis*, 1859, p. 245 [Natal]; *P. L. Selater, P. Z. S.* 1866, p. 22 [Cathcart div.]; *Sharpe, Monogr. Alced.* p. 35, pl. ii (1869); *Ayres, Ibis*, 1879, p. 291 [Rustenburg and Potchefstroom]; *Holub & Pelz. Orn. Süd-Afrikas*, p. 63 (1882).
Corythornis cyanostigma, *Buckley, Ibis*, 1874, p. 364; *Shelley, Ibis*, 1875, p. 68 [Durban]; *Sharpe, ed. Layard's B. S. Afr.* pp. 108, 806 (1875-84); *Barratt, Ibis*, 1876, p. 198; *Ayres, ibid.* p. 425 [Lydenburg]; *Oates, Matabeleland*, p. 303 (1881); *Builer, Feilden, and Reid, Zool.* 1882, p. 206; *Shelley, Ibis*, 1882, p. 244 [Mashonaland]; *Symonds, Ibis*, 1887, p. 327 [Kroonstad]; *Sharpe, Cat. B. M.* xvii, p. 163 (1892); *Shelley, B. Afr.* i, p. 116 (1896); *Sharpe, Ibis*, 1897, p. 497 [Zululand]; *Woodward Bros. Natal B.* p. 92 (1899); *Alexander, Ibis*, 1900, p. 103 [Zambesi]; *Marshall, ibid.* p. 249 [Mashonaland].

“Intangaza” of Matabele (Ayres).

Description. *Adult male.*—Crown crested, the feathers being transversely banded with black and greenish-blue; sides of the head, nape, and rest of the upper surface ultramarine-blue with

a shade of violet; quills dusky; tail like the back; throat and a line of feathers on the side of the neck behind the ear-coverts white; a frontal patch, ear-coverts, cheeks and rest of the under surface including the axillaries and under wing-coverts a rich rufous-buff.

Iris brown; bill and legs coral-red.

Length in the flesh 5·90; in the skin 5·40; wing 2·3; tail 1·0; culmen 1·35; tarsus 0·30.

The adult female resembles the male. In the young bird both male and female, the back is more blackish and the blue is cobalt rather than ultramarine and tips the black feathers; below, the ear-coverts and cheeks are darker and spotted with black, the chest also is a duskiest brown; bill black and much shorter; culmen only measuring about 1 inch; feet blackish tinged with red.



FIG. 30.—*Corythornis cyanostigma*. $\times \frac{7}{8}$.

Distribution.—The Malachite Kingfisher is found throughout the greater part of Africa south of the Sahara from Senegambia and Abyssinia (whence came Rüppell's type) to the Colony and Natal.

In South Africa it occurs abundantly, and as a resident wherever there are suitable localities as follows: Cape Colony—Cape, Malmesbury, Oudtshoorn and Knysna (Victorin), Stockenstroom (Atmore), Cathcart (Boulger), Port Elizabeth, Peddie, East London, Pondoland and Upington in Gordonia; Natal—Durban (Shelley), Pinetown (Stark), Newcastle (Butler), and Eshowe (Woodward); Orange River Colony—Valsch river at Kroonstad (Symonds); Transvaal—Lydenburg, Rustenburg, and Potchefstroom (Ayres); Rhodesia—Sibanani west of Bulawayo (Oates), near Victoria Falls (Holub), Quae Quae and Umfuli rivers (Ayres); Portuguese east Africa—along the Zambesi (Kirk and Alexander).

Habits.—This beautiful little bird is fairly abundant throughout

the Colony and frequents not only rivers and streams, but also pools and swamps; it may often be seen, usually alone, sitting on reeds or on low branches of bushes closely overhanging the water whence it darts at its prey below. It feeds on fresh-water crustacea, beetles, and other insects as well as fish, and is stated by Buckley to swim very well. The nest was found on the Berg river in September by Layard; it was situated in a bank, and consisted of a rounded chamber, at the end of a hole two or three feet deep bored in loose soil and running somewhat upwards so as to obtain a perfect drainage; the eggs, from four to six in number, are laid on a mass of fish bones and scales, probably castings; they are rounded, glistening and white, and so delicate and transparent that the yellow yolk shows plainly through when fresh. They measure about 0.75 × 0.60.

Genus IV. **ISPIDINA.**

Type.

Ispidina, *Kaup, Fam. Eiv.* p. 11 (1848) *I. picta*.

Bill comparatively short and stout, culmen not ridged but somewhat rounded and not separated by a groove from the rest of the bill; no strong crest; wings and feet as in *Corythornis*. This is a genus of small Kingfishers containing four species, all of which are confined to Africa and Madagascar.

416. **Ispidina natalensis.** *Natal Kingfisher.*

Alcedo natalensis, *Smith, S. Afr. Quart. Journ.* no. 5, p. 14 (1831);
Layard, B. S. Afr. p. 66 (1867).

Ispidina picta (*nec Bodd.*), *Gurney, Ibis*, 1859, p. 246 [Natal].

Haleyon cyanotis (*nec Swains.*), *Layard, B. S. Afr.* p. 64 (1867).

Ispidina natalensis, *Sharpe, Ibis*, 1869, pp. 281, 283; *id. Monogr. Alced.* p. 145, pl. 52 (1869); *Shelley, Ibis*, 1875, p. 69 [near Durban]; *Sharpe, ed. Layard's B. S. Afr.* pp. 113, 807 (1875-84); *Butler, Feilden, and Reid, Zool.* 1882, p. 207 [Colenso]; *Sharpe, Cat. B. M.* xvii, p. 193 (1892); *Shelley, B. Afr.* i, p. 116 (1896); *Sharpe, Ibis*, 1897, p. 497 [Zululand]; *Woodward Bros. Natal B.* p. 92 (1899); *Millar, Zool.* 1899, p. 148; *Alexander, Ibis*, 1900, p. 104 [Zambesi].

"Isipigileni" of the Natal Zulus.

Description. *Adult.*—General colour above, ultramarine, the crown barred black and ultramarine; frontal band, eyebrow, ear-

coverts and collar rufous-brown washed with metallic-lilac; a streak of bright metallic-blue behind the ear-coverts, followed by one of white; wings dusky, the coverts tipped with ultramarine; tail dusky-blue; throat and chin white, all the rest of the under surface rufous.

Iris dark brown; bill coral-red; legs and feet red.

Length about 5·0; wing 2·1; tail 1·0; culmen 0·90; tarsus 0·30.

The sexes are alike; the young birds have black bills and the blue of the back is a shade of cobalt rather than ultramarine.

Distribution.—The type of this species, described by Sir A. Smith, is stated to have come from “the eastward of Cafferland.” Though hitherto not definitely recorded from within the boundaries of the Colony it will probably be found in the extreme eastern portion.* It is common in the coast lands of Natal and has been once observed (by Reid) at Colenso. From Natal it is spread through Zululand northwards to the Zambesi, though not yet noticed in Mashonaland. Beyond our area the Natal Kingfisher is recorded from Nyasaland and Mozambique, but according to Reichenow its place is taken in German east Africa by the allied species *Ispidina picta*.

Habits.—This little Kingfisher is by no means confined to the neighbourhood of rivers and water; it is often found in thick bush at some distance away; a favourite resort is a dry, wooded “donga” where it perches on trees, on the blades of reeds or even telegraph wires. It feeds chiefly on insects, butterflies, and locusts, which it not infrequently catches on the wing; the Woodwardes also found the remains of a crab in the stomach of one individual. Both Millar and the Woodwardes have taken the eggs from the earth of an Ant-bear (*Orycteropus afer*). In Mr. Millar’s case there was a small hole about two inches in diameter, branching upwards from the Ant-bear’s hole about three feet from the entrance; a short distance along the hole was a single egg of this species while a little further along the same hole was a nest with three eggs of the Saw-winged Swallow (*Psalidoprocne holomelaema*); the Ant-bear in the meantime still retained possession of the larger burrow. A clutch of four eggs taken by the same gentleman, is now in the South African Museum; they are rounded and glistening white, like those of other Kingfishers; they measure 0·70 × 0·65.

* It has been recently obtained by Shortridge at Port St. John in Pondoland.

Genus V. **HALCYON.***Type.***Halcyon**, *Swains. Zool. Illustr.* text to pl. 27 (1820)...*H. senegalensis*.

Bill stout and comparatively short, its length about three times its breadth across the nostrils; culmen rounded and almost flattened without distinct lateral grooves; wing somewhat rounded, the third and fourth primaries the longest; legs short, the tarsus less than the middle toe; tail long, far exceeding the length of the culmen, rounded, of twelve feathers. Plumage generally bright, nearly always with metallic-blue.

This genus is a large one, spread all over the Old World except Europe and northern Asia. Fifteen African species are recognised by Shelley, six of which are included in our fauna.

Key of the Species.

- A. Bill red or reddish-brown.
- a.* Head distinctly striped, a distinct paler collar on the hind neck.
- a*¹. Larger, wing 3·5 to 4·0; no black streak through the eye and ear-coverts.
- a*². Breast and flanks distinctly streaked with black *H. albiventris*, p. 86.
- b*². Breast and flanks not streaked or streaked only slightly with brown *H. orientalis*, p. 89.
- b*¹. Smaller, wing 3·0 to 3·5; a distinct black line through the eye above the ear-coverts *H. chelicuti*, p. 89.
- b.* Head uniform, no collar on the hind neck.
- a*¹. Scapulars and mantle black *H. swainsoni*, p. 85.
- b*¹. Scapulars and mantle blue *H. senegaloides*, p. 92.
- B. Upper mandible red, lower black *H. cyanoleucus*, p. 91.

417. Halcyon swainsoni. *Grey-headed Kingfisher.*

Halcyon swainsoni, *Smith, S. Afr. Quart. Jour.* (2) no. 2, p. 143 (1834); *Layard, B. S. Afr.* p. 63 (1867); *Shelley, Ibis*, 1899, p. 376.

Halcyon semicaerulea (*nec Forsk.*), *Hartlaub, P. Z. S.* 1865, p. 88; *Sharpe, Monogr. Alced.* p. 173, pl. 64 (1869); *Gurney in Andersson's B. Damaraland*, p. 57 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 114, 807 (1875-84); *Oates, Matabeleland*, p. 303 (1881); *Shelley, Ibis*, 1882, p. 244 [Umfuli and Tati rivers]; *Ayres, Ibis*, 1885, p. 343 [Potchefstroom].

Halcyon pallidiventris, *Cabanis, Journ. Ornith.* 1880, p. 349; *Sharpe, Cat. B. M.* xvii, p. 235 (1892); *Shelley, B. Afr.* i, p. 117 (1896); *Marshall, Ibis*, 1896, p. 241 [Salisbury], 1900, p. 249; *Alexander, Ibis*, 1900, p. 104 [Zambesi].

Description. *Male.*—Crown, nape, ear-coverts and cheeks ashy, somewhat darker on the crown, which also shows traces of slightly browner shaft marks; mantle, scapulars, median- and lesser-coverts black; primary coverts, wing-quills, rump, upper tail-coverts and tail bright blue, the primaries black towards their ends and white on their inner webs; chin and throat white; chest ashy-white; abdomen, flanks, under tail-coverts and under wing-coverts orange-rufous, darkest on the flanks; wings and tail dusky-black below, some of the under primary-coverts white tipped with black.

Iris dark brown; bill, legs and feet red, claws dark brown.

Length 7.70; wing 3.80; tail 2.40; culmen 1.40; tarsus 0.53.

The female resembles the male; in the young bird the beak is black at the tip and the base, and the throat and breast are somewhat freckled.

Distribution.—The type of this species described by Smith, came from “the interior of South Africa.” The bird has been obtained in the Transvaal, Rhodesia, and Ovampoland, and on the Zambesi, north of which it reaches Angola, north Nyasaland and the interior of German east Africa.

The following are the South African localities: Transvaal—near Potchefstroom, September (Ayres); Rhodesia—Geruah in west Matabeleland, December (Oates), Tati, December, and Umfuli river, October (Ayres), Salisbury, December (Marshall); German south-west Africa—Ondonga, December (Andersson), Ochimbora, November, Omaruru, March, Omoramba, October (Eriksson in S. A. Mus.); Portuguese east Africa—Zambesi (Alexander).

Habits.—This Kingfisher, which appears to be everywhere rare, is a rainy season migrant, as it only occurs between October and March in South Africa. It is a bush-bird and by no means always found in the neighbourhood of water. According to Marshall the stomach of one examined by him contained a lizard, two slow-worms, grasshoppers, and beetles.

418. *Halcyon albiventris.* *Brown-hooded Kingfisher.*

Alcedo albiventris, *Scop. Del. Flor. et Faun. Insubr.* ii, p. 90 (1786).

Dacelo fuscicapilla, *Lafr. Revue et Mag. Zool.* 1833, pl. 18.

Halcyon fuscicapilla, *Grill, K. Vet. Akad. Handl. Stockholm*, ii, no. 10, p. 46 (1858); *Gurney, Ibis*, 1859, p. 243 [Natal], 1860, p. 204; *Layard, B. S. Afr.* p. 63 (1867).

Halcyon albiventris, *Ayres, Ibis*, 1869, p. 290 [Limpopo]; *Sharpe, Monogr. Alced.* p. 177, pl. 65 (1870); *Buckley, Ibis*, 1874, p. 364 [Limpopo]; *Shelley, Ibis*, 1875, p. 68 [Durban]; *Sharpe, ed. Layard's B. S. Afr.* pp. 115, 807 (1875-84); *Barratt, Ibis*, 1876, p. 198 [Rustenburg]; *Ayres, Ibis*, 1879, p. 292; *Oates, Matabeleland*, p. 303 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 63 (1882); *Butler, Feilden, and Reid, Zool.* 1882, p. 207 [Ladysmith]; *Sharpe, Cat. B. M.* xvii, p. 236 (1892); *Shelley, B. Afr.* i, p. 117 (1896); *Rendall, Ibis*, 1896, p. 167 [Barberton]; *Sharpe, Ibis*, 1897, p. 497 [Zululand]; *Woodward Bros. Natal B.* p. 93 (1899); *Millar, Zool.* 1899, p. 148; *Woodward Bros. Ibis*, 1900, p. 520 [St. Lucia bay].
 "Bush Kingfisher" of the colonists, "nongozolo" of Natal Zulus.

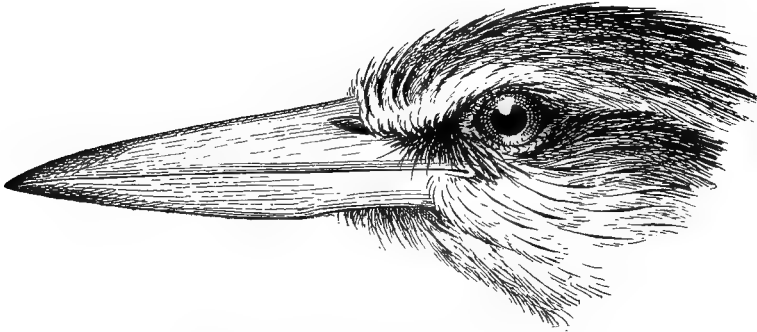


FIG. 31.—*Halcyon albiventris*. $\times \frac{7}{8}$.

Description. Adult male.—Crown ashy-brown streaked profusely with darker, round the neck a conspicuous dirty white collar, also with brown streaks; mantle and scapulars and most of the coverts black, primary coverts blue tipped with black; wing-quills blue with black tips and pale ochre on the inner webs; lower back, rump, upper tail-coverts, and tail-feathers cobalt-blue, rather duller on the tail; lores, eyebrows, cheeks, and ear-coverts dirty-white streaked with brown; chin and throat pure white becoming a pale fulvous on the lower breast, under wing-coverts, flanks, abdomen, and lower tail-coverts; wing and tail-quills dusky below.

Iris brown; bill red, black towards the tip; legs and feet dark red.

Length about 8.40; wing 4.0; tail 2.60; culmen 1.70; tarsus 0.60.

The female differs from the male, having the back brown not black, the crown, on the other hand, is darker than that of the

male and is much less distinctly streaked; the flanks, too, are a good deal more ochreous and streaked with black shaft-lines. The young bird is duller in colour throughout; the head is almost uniform, and the bill black, reddish towards the base.

Distribution.—The Brown-hooded Kingfisher is found in the more wooded districts of the Colony from Swellendam eastwards; it is common throughout the greater part of Natal and the bush-country of the Transvaal, but does not appear to reach the high plateau of the interior of South Africa or the drier western districts. On the Zambesi and north of that river it is replaced by the next species.

The following are localities: Cape Colony—Swellendam, George (Layard), Oudtshoorn, Knysna (Victorin), Port Elizabeth, Peddie, East London, Pondoland, Stockenström and Kuruman in Bechuanaland div. (Layard); Natal—Durban (Shelley), Pinetown (Stark), Ladysmith (Reid), Ulundi, Eshowe, Black Umfolosi river and St. Lucia lake all in Zululand (Woodward); Transvaal—Barberton (Rendall), Lydenburg (Francis in S. A. Mus.) and Rustenburg district (Ayres).

Habits.—This Kingfisher is often found a good distance from water. It is fond of perching on some conspicuous dead branch not far from the ground, hence it makes short flights in pursuit of its prey, which usually consists of large insects, such as crickets and grasshoppers or even earthworms and small snakes; these are captured on the ground. It has a loud chattering note, somewhat like that of a Laughing Jackass, while the alarm note is harsh and rattling.

Buckley found this Kingfisher breeding on the Limpopo in November, and there are eggs in the South African Museum taken by Millar at Illovo, in Natal, on November 1, and by Stark at Pinetown, near Durban, on October 11. The latter found the nest-hole situated in a sand-bank at the side of a stream; the hole was about 3 ft. 9 ins. deep, ending in a good-sized chamber 18 inches below the surface of the ground, the floor of which was covered, as is usual, with castings. The eggs, four in number, are rounded ovals, and measure 1.15×0.97 ; they are white, but not so shiny as those of *Ceryle rudis*, though when fresh they are of a salmon tint owing to the yolk showing through the thin shell.

Mr. Millar describes a curious incident in connection with this bird. He found a pair had nested in a hole bored in the side of a sand pit in his garden, and when discovered had already hatched

their young. In the pit stood an old ladder, and shortly afterwards he was surprised to find four large eggs lying on the ground at the bottom of the pit below the rungs of the ladder from which they had evidently been dropped. Doubtless the bird, having already a young family, was embarrassed as to what to do with her fresh eggs and so disposed of them in this manner.

The Woodwards found these birds did well in captivity if supplied with plenty of water and fed on a diet of finely-cut meat.

419. **Halcyon orientalis.** *Peters' Kingfisher.*

Halcyon orientalis, *Peters, Journ. f. Orn.* 1868, p. 134; *Sharpe, Monogr. Alced.* p. 181, pl. 66 (1869); *id. ed. Layard's B. S. Afr.* pp. 116, 807 (1875-84); *id. Cat. B. M.* xvii, p. 238; *Shelley, B. Afr.* i, p. 117 (1896); *Alexander, Ibis*, 1900, p. 104 [Zambesi]; *Sharpe, ibid.* p. 115 [Beira distr.].

Description. *Adult male.*—Closely resembling *H. albiventris* but whiter below with only a slight tinge of pale ochreous-buff on the sides of the body and under tail-coverts; stripes on the flanks and breast absent or faintly marked.

Iris brown; bill, legs, and feet coral-red.

Length (measured in the flesh) 11·0; wing 4·1; tail 2·9; culmen 1·8.

The female like that of *H. albiventris*, has a browner back and head, and the blue of the wings and tail is of a more greenish tinge.

Distribution.—The type of this species was obtained by Dr. Peters at Inhambane in Portuguese east Africa. It has also been procured at Mapicuti, in the Cheringoma district north of Beira by Cavendish, and on the Zambesi by Alexander. It is as yet uncertain whether this or the preceding species inhabits Mashonaland. Beyond our limits Peters' Kingfisher extends through east Africa as far north as Lamu and Kilimanjaro in the east and Angola and the Congo Free State in the west.

420. **Halcyon chelicuti.** *Striped Kingfisher.*

Alcedo chelicuti, *Stanley, Salt's Exped. Abyss. App.* p. 56 (1814).

Alcedo striolata, *Licht. Verz. Doubl.* p. 12 (1823).

Halcyon damarensis, *Strickland and Sclater, Contr. Ornith.* 1852, p. 153; *Ayres, Ibis*, 1869, p. 290 [Limpopo].

Halcyon striolata, *Kirk, Ibis*, 1864, p. 325 [Zambesi]; *Layard, B. S. Afr.* p. 64 (1867); *Sharpe, Ibis*, 1869, p. 277.

Halcyon chelicutensis, Sharpe, *Monogr. Alced.* p. 187, pl. 67 (1870); Gurney, *Andersson's B. Damaraland*, p. 57 (1872); Sharpe, ed. *Layard's B. S. Afr.* pp. 117, 807 (1875-84); Oates, *Matabeleland*, p. 303 (1881); Shelley, *Ibis*, 1882, p. 244 [Umfuli river]; Sharpe, *Cat. B. M.* xvii, p. 239 (1892); Shelley, *B. Afr.* i, p. 117 (1896); Sharpe, *Ibis*, 1897, p. 497 [Zululand]; Sowerby, *Ibis*, 1898, p. 571 [Ft. Chiquaqua]; Woodward Bros. *Natal B.* p. 94 (1899); Marshall, *Ibis*, 1900, p. 249.

Halcyon chelicuti, Ayres, *Ibis*, 1879, p. 293 [Rustenburg]; Holub & Pelzeln, *Orn. Süd-Afrikas*, p. 63 (1882).

Description. *Adult.*—Crown and head light brown, strongly striped with very dark brown; a black stripe runs through the eye above the ear-coverts and is continued round the nape of the neck to form a narrow collar, behind which is a rather wider, dirty white one somewhat spotted with black; mantle, scapulars and wing-coverts dark ashy, some of the latter edged with pale buff, wing-quills ashy, edged, especially the secondaries, with blue, the concealed bases by white; back, rump, and upper tail-coverts bright cobalt; tail darker and duller blue; throat white; cheeks, ear-coverts and the rest of the lower surface buffy-white streaked and freckled with dark brown, narrowly on the ear-coverts and breast, more strongly on the flanks; axillaries and under wing-coverts white, the primary under wing-coverts black, forming a spot on the under side of the wing.

Iris dark brown; bill, upper mandible purplish-red, lower bright red; legs and feet light red, red-brown in front.

Length in flesh 7·5, in skin 7·20; wing 3·3; tail 1·7; culmen 1·25; tarsus 0·45.

The sexes are alike; the young birds are duller in colour and are more thickly streaked on the lower side.

Distribution.—The Striped Kingfisher is found over the greater part of Africa from the Gambia on the west, and Abyssinia (whence came Lord Stanley's type) and Somaliland on the east, southwards to the Orange river. Within our limits it has not been noticed south of the Orange river or in Natal proper, though it appears to be common in Zululand, and thence northwards to the Zambesi.

The following are localities: Cape Colony—Upington on the Orange river (Bradshaw in S. A. Mus.); Zululand—Eshowe and St. Lucia Lake (Woodward); Transvaal—Lydenburg (Francis in S. A. Mus.), Pretoria (Bt. Mus.), and Rustenburg (Ayres); Rhodesia—Pandamatenka, near Victoria Falls (Holub), Umfuli river (Ayres), Salisbury district (Marshall); German south-west Africa—Elephants

Vley and Hykomkop in Damaraland (Andersson); Portuguese east Africa—Zambesi valley (Kirk).

Birds of this species from Senegambia and Somaliland are rather smaller, have shorter bills, and are generally somewhat more richly coloured; while specimens from tropical Africa are intermediate in this respect. Should it be necessary to distinguish the South African bird, it may be called *Halcyon chelicuti damarensis*.

Habits.—Like others of the same genus this bird is by no means confined to the neighbourhood of water; it is found equally on the sea coast, along the rivers, and in the plains and bush. It is usually solitary, and perches on a low branch of an isolated tree, keeping a look out for beetles and grasshoppers which it takes on the wing, and which form the chief part of its diet. This bird is stated by Kirk to have a sweet song both before and during the rains, and Ayres and the Woodwards confirm this. No observer in South Africa has given an account of its breeding habits, but Böhm found a nest in German east Africa on March 21 placed in a hole in a tree 15 feet above the ground. The entrance was very narrow, and the hole only about 9 inches deep; at the bottom were two nearly hatched young and an addled egg, the latter white, and measuring 1.0 × 6.3. It would be interesting to be able to confirm this account, as it is quite unusual for Kingfishers to build in trees.

421. **Halcyon cyanoleucus.** *Angola Kingfisher.*

Alcedo cyanoleuca, Vieill. *N. Dict. H. N.* xix, p. 401 (1818).

Halcyon senegalensis (nec Linn.), Gurney, *Ibis*, 1865, p. 265 [Zululand]; Layard, *B. Afr.* p. 62 (1867).

Halcyon cyanoleucus, Gurney, *Ibis*, 1868, p. 265; Sharpe, *Monogr. Alced.* p. 189, pl. 69 (1869); Gurney, in Andersson's *B. Damaraland*, p. 56 (1872); Buckley, *Ibis*, 1874, p. 365; Sharpe, ed. Layard's *B. S. Afr.* pp. 120, 808 (1875-84); Oates, *Matabeleland*, p. 303 (1881); Sharpe, *Cat. B. M.* xvii, p. 245 (1892); Shelley, *B. Afr.* i, p. 117 (1896); Sharpe, *Ibis*, 1897, p. 498 [Zululand]; Woodward Bros. *Natal B.* p. 94 (1899).

Description. *Adult*.—General colour above, bright cobalt-blue, the crown of the head rather duller and more greenish; a white eyebrow above the eye; feathers in front and behind the eye black; all the wing-coverts black; wing-quills black with concealed white bases and cobalt-blue edging, the latter becoming wider and more

conspicuous towards the inner secondaries; tail blue, slightly darker than the back; below, including the under wing- and tail-coverts, white; the cheeks, ear-coverts, breast and flanks, slightly dusted with a greenish-silvery freckling; tail and wing-quills black below.

Iris dark grey; bill, upper mandible red, lower jet-black; legs and feet black.

Length 8·8; wing 4·40; tail 3·0; culmen 1·75; tarsus 0·55.

The female resembles the male in colour and size.

Distribution.—The Angola Kingfisher is found over the greater part of Africa from Ashantee in the west and Abyssinia in the east southwards. Within our limits it is not very common; it has only once been obtained in the Colony at Knysna by Mr. W. Atmore; other localities are Zululand—Monocusi (Umhlatuzi) river (Ayres), Ulundi and Black Umfolosi (Woodward); Transvaal—Lydenburg (Francis in S. A. Mus.), Limpopo river (Buckley); Bechuanaland—Bamangwato (Exton); Rhodesia—Nata river west of Bulawayo (Oates), Salisbury (Marshall in litt.); German southwest Africa—Ondonga in Ovampoland (Andersson).

This bird is considered by Sharpe in his catalogue as a subspecies of *Halcyon senegalensis*, from which it differs only in having the crown the same colour as the back, whereas in the former the crown is brown and contrasts with the back. In the South African specimens that I have examined the crown varies in shade a good deal, but is always somewhat duller than the back; but at present, the relations of these two species, or sub-species, to one another, are not easily settled, more especially as they inhabit much the same area.

Habits.—Little has been noticed about the habits of this bird. Buckley states that it is shy and has a monotonous whistle, while Andersson remarks on its pleasant thrilling notes; to the Woodwards its voice could be compared only to the somewhat unromantic sound of "the mainspring of a clock let loose."

422. *Halcyon senegaloides*. Mangroove Kingfisher.

Halcyon senegaloides, *Smith, S. Afr. Quart. Journ.* (2) no. 2, p. 144 (1834) [Port Natal]; *id. Ill. Zool. S. Afr. Aves*, pl. 63 (1840); *Gurney, Ibis*, 1865, p. 265; *Layard, B. S. Afr.* p. 63 (1867); *Sharpe, Monogr. Alced.* p. 187, pl. 68 (1869); *id. ed. Layard's B. S. Afr.* p. 119 (1875); *Shelley, B. Afr.* i, p. 117 (1896).

Halcyon irrorata, *Reichenb. Handb. Alced.* p. 11, pl. 400, fig. 3078

(1851); *Sharpe, Cat. B. M.* xvii, p. 242 (1892); *Woodward Bros. Natal B.* p. 94 (1899).

Description.—Similar to *H. cyanoleucus*, but of a duller and darker shade of blue on the back and at once distinguished by its entirely red bill.

Iris dark brown; bill deep red; legs and feet dark reddish-yellow.

Length 9·0; wing 3·9; tail 2·4; culmen 2·05; tarsus 0·55.

In the female the bill is somewhat dusky towards the tip, and the plumage is duller; the under wing-coverts are distinctly tinged with ochreous and the breast is more strongly freckled.

Distribution.—The type of this species was obtained by Sir A. Smith near Durban, and the bird is stated by Ayres and Quekett to be fairly common about Durban harbour among the mangrooves during the cold weather only. It has also been noticed by Rickard on the Buffalo river at East London. No other South African localities have been recorded. The South African Museum is indebted to Mr. A. D. Millar for an example shot on June 28 at Umbilo on Durban harbour. Beyond our limits the Mangroove Kingfisher extends through German and British east Africa as far as Mombasa.

Habits.—Mr. Millar sends me the following note:—"These birds are sparingly found in the mangroves skirting the head of the bay at Durban, generally singly or in pairs, and they might readily be mistaken for *H. albiventris* unless one happened to be very near, which seldom occurs, as they are very wary, and even when cautiously approached dive into the mangroves at the slightest alarm. I have hunted along the creeks and river banks in the hope of discovering their nests, but so far without success; it may be that they migrate when nesting, as they disappear during the summer months which is probably the breeding season."

Mr. Ayres gives a similar account, and further states that they feed principally on small crabs, though sometimes fishes are taken.

Family IV. COLIIDÆ.

Bill short, stout, and finch-like, with nostrils at the base; tail of ten feathers, long and graduated; toes pamprodactylous, *i.e.*, all four including the hallux are normally turned forward, but both hallux and fourth toe can at will be turned backward. Flexor

tendons Coraciine (fig. 2, *e*, p. 2); spinal feather-tract well defined on the neck, not forked on the back; oil gland tufted; no cæca.

This family, containing only one genus, is strictly confined to the Ethiopian Region, exclusive of Madagascar.



FIG. 32.—Left foot of *Colius striatus*. $\times \frac{1}{4}$.

This very isolated and well-marked group was formerly associated with the Finches and other Passerine families; but the researches of Murie ("Ibis," 1872, p. 262) and Garrod (P. Z. S. 1876, p. 419), have shown that they are not Passerine birds at all, but have their nearest relations among the Kingfishers and Hornbills, with perhaps more distant affinities to the Parrots and Plantain-eaters. In habits they are all very similar, being gregarious, constructing open cup-shaped nests and laying white, or nearly white, eggs.

Genus I. **COLIUS.**

Type.

Colius, *Brisson, Orn.* iii, p. 304 (1760) *C. capensis*.

This, the only genus of the family, contains some ten species of small birds with finch-like bills, crested heads, short wings, very long and graduated tails and stout, climbing feet; the plumage of most of the species is dull, of various shades of greys and browns, and the sexes are alike.

All the species are confined to Africa, and three are found within our limits.

Key of Species.

- A. Lower back white bordered on either side by black, upper tail-coverts maroon *C. capensis*, p. 97.
 B. Lower back and rump like the rest of the upper surface a speckled brown *C. striatus*, p. 95.
 C. General colour above, greyish-green.
 a. Forehead ochre-yellow *C. erythromelon*, p. 99.
 b. Forehead creamy-white *C. erythromelon lacteifrons*, p. 100.

423. **Colius striatus.** *Speckled Mouse-bird.*

Colius striatus, *Gmel. Syst. Nat.* i, p. 843 (1788); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 45 (1858) [Knysna]; *Gurney, Ibis*, 1860, p. 213 [Natal], 1862, p. 157, 1864, p. 359; *Layard, B. S. Afr.* p. 222 (1867); *Shelley, Ibis*, 1875, p. 81 [Durban]; *Barratt, Ibis*, 1876, p. 204 [Macamac]; *Sharpe, ed. Layard's B. S. Afr.* pp. 555, 853 (1882-4); *Butler, Feilden and Reid, Zool.* 1882, p. 207; *Shelley, Ibis*, 1885, p. 311; *Sharpe, Cat. B. M.* xvii, p. 339 (1892); *Shelley, B. Afr.* i, p. 118 (1896); *Rendall, Ibis*, 1896, p. 174 [Barberton]; *Sharpe, Ibis*, 1897, p. 515 [Zululand]; *Woodward Bros. Natal B.* p. 95 (1899); *Alexander, Ibis*, 1900, p. 104 [Tete].



FIG. 33.—*Colius striatus*. $\times \frac{1}{4}$.

Le Coliou raye, *Levaill. Ois. d'Afr.* vi, p. 36, pl. 256 (1808).

“Muis-Vogel” of the Dutch (applied to all the species). “Indhlazi” of Natal Zulus (Woodward).

Description. *Adult.*—General colour above ashy-grey, paler on the head, darker on the rump; feathers of the head and back much decomposed and slightly vermiculated, those of the crown elongated

to form a loose crest; wings and tail ashy-brown, not vermiculated; below, the throat, upper breast and sides of the body ashy-brown, strongly vermiculated with darker, the lower breast, under wing- and tail-coverts ochreous, darkest on the coverts; lining of the quills and lower side of the tail-feathers chestnut-buff. In some specimens the forehead and chin are dark, almost black, perhaps due to staining with fruit.

Iris dark brown, bare skin round the eye black; bill, upper mandible black, lower, bluish-brown; legs and feet purplish-brown.

Length 13·0 to 14·0; wing 3·70; tail 8·0 to 8·5; culmen 0·5; tarsus 0·9.

The sexes are alike. In the South African Museum are a curious pair of semi-albinos in which the crest, a few feathers on the back, the tail and the lower parts from the breast downwards are pure white, the rest of the bird being normally coloured; they were shot near Goudini in the Worcester division of the Colony.

Distribution.—This Mouse-bird is found throughout the greater part of South Africa from Cape Town (where, however, it is less common than the other two species) to the Zambesi; so far as I am aware it has not been noticed in the western Transvaal, Bechuanaland, Rhodesia, and German south-west Africa, but this may be through lack of observation. North of the Zambesi this bird has been hitherto only obtained in Nyasaland. The following are the principal localities: Cape Colony—Cape, Stellenbosch, Tulbagh, Worcester, Caledon, Knysna and Middelburg divisions (S. A. Mus.), Griquatown (B. Hamilton), Port Elizabeth and East London (Rickards), King Williams Town (Brit. Mus.), Port St. John (Shortridge); Natal—Durban and Pinetown (Shelley), Escourt (Reid), Ulundi and Eshowe (Woodward); Transvaal—Swaziland (Buckley), Barberton (Rendall), and Macamac in Lydenburg (Barratt); Portuguese east Africa—Tete and below on the Zambesi (Alexander).

Habits.—The habits of all Mouse-birds are very similar; they are to be seen almost invariably in small parties of from six to twelve individuals; even when the females are incubating the males keep together. They affect thick bush where they climb like tits, crawling about and placing themselves in all sorts of different attitudes; in doing this the whole of the tarsus is often applied to the branch acting like the sole of a foot and is often much rubbed in consequence. When alarmed they fly off one after another with short

direct flight, compared by le Vaillant to an arrow shot from a bow. The Mouse-bird feeds entirely on fruit and is generally to be seen in a garden as soon as figs and loquats, of which it is specially fond, become ripe; during the fruit season they do a good deal of damage in the western portion of the Colony. At night time they are stated by Ayres to roost head downwards in small companies. Shelley found a nest at Pinetown in Natal on March 15. Stark at the same place on December 18. In the latter case the nest, which was placed on the top of an orange tree about fifteen feet above the ground, was an open one, resting on and surrounded by twigs of the bush; it was rather small and was loosely built of pieces of bark three or four inches long, of the Kaffir tea-plant, of a flowering weed and small twigs; it was lined with *green* narrow fronds and leaves. There were three quite fresh eggs in the nest, and there were enlarged eggs in the ovary of the female which was secured, the clutch is therefore more than three, probably five to seven. The eggs are rough and were probably originally chalky-white, but are a good deal stained with dirt. They are ovals somewhat pointed at the acute end, and measure on an average 0.92×0.62 .

Mr. Ayres was the first to notice this bird's habit of lining the nest with fresh leaves, and suggested that perhaps dampness was necessary for incubation.

424. **Colius capensis.** *White-backed Mouse-bird.*

Loxia colius, *Linn. Syst. Nat.* 12th ed. i, p. 301 (1766).

Colius capensis, *Gmel. Syst. Nat.* i, p. 842 (1788); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 45 (1858) [Oudtshoorn]; *Gurney, in Andersson's B. Damaraland*, p. 202 (1872); *Holub & Pelz. Orn. Süd-Afrikas*, p. 136 (1882); *Sharpe, ed. Layard's B. S. Afr.* pp. 552, 853 (1882-4); *Shelley, Ibis*, 1885, p. 310.

Colius erythropus, *Gmel. Syst. Nat.* i, p. 842 (1788); *Burchell, Travels*, i, pp. 213, 335 (1822); *Layard, B. S. Afr.* p. 221 (1867); *id. Ibis*, 1868, p. 247; *Ayres, Ibis*, 1871, p. 259 [nr. Potchefstroom.]

Le Coliou á dos blanc, *Levaill. Ois. d'Afr.* vi, p. 391 (1808).

Colius colius, *Sharpe, Cat. B. M.* xvii, p. 343 (1892); *Shelley, B. Afr.* i, p. 118 (1896).

Description. *Adult.*—Above, crown, the feathers of which are decomposed and elongated to form a crest, mantle, wings and tail dark ashy with a slight lilac tinge; down the centre of the back a

line of white bordered on either side by a patch of black; below this is a patch of dark maroon on the rump; the upper tail-coverts ashy like the back; two outer pair of tail-feathers edged with white; below, the throat is like the back gradually assuming a pink shade on the breast; the abdomen and lower tail-coverts are ochreous; the greater under wing-coverts are black, contrasting with the median and lesser series which are white.

Iris and a very small patch of bare skin round the eye black; bill, bluish-white or pale cobalt at the base, the tip of the upper mandible black, of the lower yellowish-brown; legs and feet coral-red, claws black.

Length 13 to 14; wing 3.40; tail 8.5 to 9.5; culmen 0.45; tarsus 0.75.

Sexes alike; a nestling resembles the adult but is without the maroon patch on the rump, the upper mandible was bright yellowish-green, and the lower one dull black.

Distribution.—The White-backed Mouse-bird appears to be altogether a more western form than the Speckled Mouse-bird; it is abundant at Cape Town and about the western half of the Colony, and extends through the western part of the Orange River Colony and the Transvaal to German south-west Africa, where it appears to be widely distributed.

The following are localities: Cape Colony—Cape and Stellenbosch divisions (S. A. Mus.), Oudtshoorn (Victorin), Ceres and Griqualand West (Burchell), Orange river at Upington (Bradshaw) and near Aliwal North (Whitehead); Orange River Colony—Jacobsdal district (Holub); Transvaal—Potchefstroom district (Ayres); German south-west Africa—Great Namaqualand to the Okavango (Andersson).

Habits.—This bird closely resembles the preceding one in its habits. It is gregarious, it roosts in companies congregated into a ball; it loves thick bush, where it will creep about like a parrot using both bill and claws and often hanging with its head downwards without inconvenience. It is essentially a fruit-eater, though stated by Andersson not to despise insects and young shoots of plants when its regular food is scarce. Its note is a harsh chatter, syllabled by le Vaillant as “qui ve, qui ve,” to which it gives vent when flying from one tree to another. Its flesh is very palatable. Nests of this species have been taken by Andersson on September 26, October 16, and December 29; they were usually built in a bush and were composed externally of grass and twigs, lined internally with

softer grass; in each case there were three eggs; no mention is made of a lining of fresh green leaves, such as is found in that of the Speckled Mouse-bird.

The eggs are dirty white and chalky, like those of the preceding species, and measure 0·90 × 0·65.

425. *Colius erythromelon*. *Red-faced Mouse-bird*.

Le coliou quiwiwa, *Levaill. Ois. d'Afr.* vi, p. 42, pl. 258 (1808).

Colius erythromelon, *Viell. N. Dict. H. N.* vii, p. 378 (1817); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 45 (1858) [Oudtshoorn]; *Buckley, Ibis*, 1874, p. 373; *Ayres, Ibis*, 1880, p. 108 [Rustenburg]; *Oates, Matabeleland*, p. 305 (1881); *Holub & Pelz. Orn. Süd-Afrikas*, p. 137 (1882); *Sharpe, ed. Layard's B. S. Afr.* pp. 551, 853 (1882-4); *P. L. Sclater, P. Z. S.* 1884, p. 475, pl. 45; *Shelley, Ibis*, 1885, p. 309; *Sharpe, Cat. B. M.* xvii, p. 344 (1892); *Shelley, B. Afr. i*, p. 118 (1896); *Sharpe, Ibis*, 1897, p. 515 [Zululand]; *Alexander, Ibis*, 1900, p. 105 [Zumbo].

Colius quiwiwa, *Rüpp. Mus. Senck.* iii, p. 43 (1845); *Kirk, Ibis*, 1864, p. 329 [Zambesi].

Colius capensis (*nec Gmel.*), *Layard, B. S. Afr.* p. 222 (1867); *Ayres, Ibis*, 1868, p. 47 [Natal]; *Barratt, Ibis*, 1876, p. 204 [Marico].

"Ishivovu" of the Zulus (Woodward).

Description. *Adult.*—General colour above, a greyish-green, darkest on the wings and tail; occiput crested; forehead tawny-buff; below ochreous-buff; the chin and throat paler, almost white; breast with a purplish shade, sides of the neck and cheeks more greenish like the back, abdomen darker ochreous, flanks and thighs greenish; under wing-coverts dark ochre, quills below chestnut, darker at the tips.

Iris grey; tip of upper mandible and the lower one black; basal part of upper one and bare skin round the eye crimson; legs and feet rose-red.

Length 13·5 to 14·5; wing 3·6; tail 8·4; tarsus 0·8; culmen 0·55.

The sexes are alike, but the female is somewhat smaller.

Distribution.—The Red-faced Mouse-bird was first obtained by Levallant on the banks of the Gamtoos river, in what is now the Hankey division of the Colony. It is spread over the greater part of South Africa from Cape Town and Natal to the Zambesi, though it has not, so far as I am aware, been noticed in Rhodesia; beyond our limits it reaches Benguela and Nyasaland.

The following are recorded localities: Cape Colony—Cape div. Feb. April and July, Stellenbosch, Nov., Caledon, Dec. (S.A. Mus.),

Swellendam, Oudtshoorn (Victorin), George and Knysna (Layard), Port Elizabeth and East London (Rickard), Willowmore (Atmore), and Middelburg (S. A. Mus.); Natal—Maritzburg (Fitzsimmons), Hlabisa and Ulundi in Zululand (Woodward); Transvaal—Rustenburg (Ayres); Bechuanaland—Makalapsi river near Shoshong (Oates), Tati river (Holub); Portuguese east Africa—Zumbo and Chicowa on the Zambesi (Alexander).

Habits.—The Red-faced Mouse-bird does not differ from the other Mouse-birds in habits. It is gregarious in flocks of from six to twelve individuals; it feeds on berries and fruits; its flight is rapid, straight and short, and it climbs and crawls about amid thick bush; its cry is shrill and somewhat resembles its native Zulu name according to the Woodward. The latter authors also describe a nest found in the fork of a thorn tree near the Umhlatusi river in Zululand. It was composed of wild cotton in seed, an inch thick, on a platform of thorny twigs. The eggs, three in number, were white, freckled and streaked with red.

Holub found that this bird did well in captivity in a large cage along with other birds, and fed best on oranges.

425a. *Colius erythromelon lacteifrons.* *White-fronted Mouse-bird.*

Colius erythromelon (nec Vieill.), Gurney in Anderson's *B. Damara-land*, p. 203 (1872).

Colius lacteifrons, Sharpe, *Cat. B. M.* xvii, p. 345 (1892); *id. Hand-list Bds.* ii, p. 146 (1900).

Colius indicus, var. *lacteifrons*, Fleck, *Journ. Ornith.* 1894, p. 395.

Description.—Resembling *C. erythromelon typicus*, but paler in every respect and with a creamy-white forehead.

Distribution.—German south-west Africa, rare in Damaraland, more abundant on the Okavango river.

Family V. BUCEROTIDÆ.

Bill large, or very large, usually bearing on the culmen an elevation called a casque which is variously shaped and often as long as the bill itself (though not so as a rule in South African species); margins of the eyes furnished with strong eyelashes;

eleven primaries, ten tail-feathers ; the under wing-coverts do not cover the basal portion of the quills below and perhaps this may account for the loud noise made by these birds when flying, the sound being produced by the rushing of air between the quills ; the oil gland is tufted, and further covered by a dense mat of short feathers ; spinal feather tract not defined by lateral bare tracts on the neck ; cæca absent.

The sexes are alike in plumage though the colours of the soft parts and the bills show sometimes sexual distinctions ; the eggs are white and the young are born helpless.

The family is found all over the Ethiopian and Oriental regions, extending eastwards through the Malayan Isles to New Guinea and the Solomons.

Key of the Genera.

- A. Tarsus long, twice the length of the middle toe and claw *Bucorax*, p. 101.
- B. Tarsus about equal to, or less than the length of the middle toe and claw.
 - a. Bill without, or with only a small, keel-shaped casque..... *Lophoceros*, p. 108.
 - b. Bill with (in the South African species) a large sub-cylindrical casque extending behind the eye. ...*Bycanistes*, p. 106.

Genus I. **BUCORAX.**

Type.

Bucorvus, *Less. Traité Orn.* p. 259 (1831)*B. abyssinicus.*

Bucorax, *Sundev. Ofvers. K. Vet. Akad. Handl.* vi, p.

161 (1849)*B. abyssinicus.*

Bill long, pointed, compressed and slightly curved ; casque covering the basal third or more of the culmen, either elevated and open in front or keel shaped and compressed ; no crest ; throat naked and wattled ; tail short, the feathers sub-equal, about half the length of the wing ; tarsus long, about twice the length of the middle toe and claw.

This genus is further distinguishable from the others of the family by several anatomical characters of some importance ; the chief of these is the arrangement of the arteries of the neck ; the usual carotids carrying the blood to the head, which in other genera of the family join together at the bottom of the neck and run along the hyppophysial canal formed by the ventral processes of the

cervical vertebræ are in this case represented only by a rudimentary fibrous cord, and their function is assumed by two superficial arteries running up the neck alongside of the pneumogastric nerve. This arrangement is unknown in any other genus of birds.

In addition to this the septum by which the gizzard is suspended in the body cavity and the ossification of the tracheal rings which form the syrinx, present certain differences from the arrangements current among the rest of the Hornbills. Full accounts of these matters will be found in papers by Garrod (P. Z. S. 1876, p. 60), Otley (P. Z. S. 1879, p. 461, figs. 1-3) and Beddard (P. Z. S. 1885, p. 841, fig. 2, and 1889, p. 588, fig 2).

The genus is confined to Africa and contains, in addition to the species described, one other (*B. abyssinicus*) distinguished by the possession of a considerable casque, abruptly truncate, and open anteriorly, and also by the blue colour of its wattle. This latter form is found throughout western and north-eastern Africa.

426. *Bucorax cafer*. *Brom-vogel*.

- Bucorax abyssinicus*, Gurney (*nec Bodd.*), *Ibis*, 1861, p. 132, 1862, p. 37 [Natal]; *Kirk, Ibis*, 1864, p. 325 [Zambesi].
- Buceros carunculatus*, var. *cafer*, *Schlegel, Mus. Pays Bas*, i, p. 2 (1862).
- Bucorvus abyssinicus*, *Layard, B.S. Afr.* p. 228 (1867); *Gurney, Ibis*, 1868, p. 162; *Ayres, Ibis*, 1869, p. 296 [Limpopo]; *Gurney in Andersson's B. Damaraland*, p. 205 (1872); *Garrod, P. Z. S.* 1876, p. 60 (anatomy).
- Bucorax cafer*, *Bocage, P. Z. S.* 1873, p. 698, figs. 2, 5, 6; *Sharpe, ed. Layard's B. S. Afr.* p. 122 (1875); *Grant, Cat. B. M.* xvii, p. 351 (1892); *Kirby, Wild Game*, pp. 448, 460 (1896); *Woodward Bros. Natal Birds*, p. 97 (1899); *Marshall, Ibis*, 1900, p. 249 [Mashonaland]; *W. L. Sclater, Zool.* 1902, p. 49, with fig.
- Bucorvus cafer*, *Elliot, Mon. Bucerot.* pl. 3 (1880); *Shelley, Ibis*, 1882, p. 245 [Mashonaland], 1888, p. 49; *id. B. Afr.* i, p. 113; *Alexander, Ibis*, 1900, p. 100 [Zambesi].
- "Ground Hornbill" of some authors. "Turkey Buzzard" of English Colonists. "Brom-vogel" of Dutch. "Intsingizi" of Amaxosa (Stanford) and of Zulus.

Description. Adult male.—Plumage black throughout, except the primaries which are white; bill and casque black with the casque rounded above and sloping off to the ridge of the bill, not cylindrical and open in front as in the Abyssinian species.

Iris pale sea-green ; naked skin round the eye and of the throat and neck, vermilion-red ; legs black.

Length about 42·0 ; wing 24·0 ; tail 13·5 ; culmen including casque 8·75 ; tarsus 5·5.

The female resembles the male in plumage but the casque is somewhat narrower and the greater part of the bare skin of the neck is dark blue, leaving only an outside rim and the skin round the eye



FIG. 34.—*Bucorax cafer*.*

scarlet-red ; wing 21·5 ; bill and casque 7·75. Weight, according to Ayres, 9 lbs.

Kirby states that the young bird is mottled-grey all over.

Distribution.—The Brom-vogel is found only in the eastern half of the Colony, whence it ranges through Natal, Zululand, the lower districts of the Transvaal and Mashonaland to the Zambesi,

* This figure is not quite correct in one particular ; when walking the toes are not flat upon the ground but bent up somewhat as if the bird were perching.

reaching the extreme northern part of Damaraland. Beyond our limits it occurs in Angola, Nyasaland and German east Africa, its place being taken in Abyssinia and West Africa by another species.

The following are recorded localities: Cape Colony—Stockenstroom (S. A. Mus.), East London (Rickards), Old Morley in Tembuland (egg, Bowker, S. A. Mus.); Natal—Ifafa (Woodward), Pinetown, Balgowan near Maritzburg and Barwon near Verulam (Stark); Zululand (Brit. Mus.); Transvaal—Lydenburg (Kirby), Limpopo river (Ayres); Rhodesia—rare in Mashonaland (Marshall); Portuguese east Africa—near Beira (Zool. Gardens), Zambesi Valley (Kirk and Alexander); German south-west Africa—Ondonga and near Okavango river (Andersson).

Habits.—These very curious birds go in small troops of from six to eight individuals; they feed entirely on the ground and move about over open country as a rule, though sometimes found in bush. Unlike other hornbills they walk and do not hop, and when pressed at all can run at a very good pace. Occasionally when flushed they take to flight, but seldom for further than half a mile or so when they generally take refuge in cover, sometimes perching on the branch of a tree. They roost at night in trees. A favourite resort is a patch of burnt ground; there with their long beaks they turn up the sods in search of insects and grubs: having found a dainty morsel they take it between the tips of their mandibles and toss it up in the air, catching it again and swallowing it immediately. They also kill and eat snakes, frogs, lizards, tortoises, rats and mice. I have not seen them kill a snake in the dramatic fashion described by Mr. Ayres ("Ibis," 1861, p. 132); but at all times when they have secured a choice morsel they will stretch out their wings, jump about and give vent to their brooming sound. Mr. Ayres' often quoted account is as follows:—"On discovering a snake, three or four of the birds will advance sideways towards it, with their wings stretched out, and with their quills flap at and irritate the snake till he seizes them by the wing-feathers, when they immediately close all round and give him violent pecks with their long sharp bills, quickly withdrawing again when the snake leaves his hold. This they repeat till the snake is dead. If the reptile advances on them, they place both wings in front of them, completely covering their heads and most vulnerable parts." When the snake is dead they proceed to bite it with their two mandibles throughout its whole length, probably dislocating the whole of the snake's

backbone; it is swallowed head first and when the snake is a large one the bird will go about for some time with half the snake trailing out from between its jaws. Tortoises are much relished, all the flesh including its head and limbs are neatly picked away from the unhappy reptile, leaving the shell clean and entire without damage.

The call of this bird is a kind of "boom-boom" constantly repeated until it becomes quite wearisome; Mr. Ayres states that it can be heard at a great distance, under favourable circumstances as far as two miles. My experience, which is, however, confined to a bird in captivity, does not confirm this, but the sound, though by no means loud, can be heard at a considerable distance. The call of the female is similar, but is pitched a tone above that of the male, and is usually heard in answer to that of the male. When booming, the red pouch under the throat is usually, though not invariably, distended with air; this action can be performed at will. Mr. Layard lays great stress on the evil stench emitted by this bird, but I have not found this at all noticeable in the case of the individual observed by myself.

A complete account of the nesting habits of this bird has not, so far as I am aware, yet been given, but it doubtless builds a nest on the flat crown of a tree where the trunk has decayed away, or else actually in a hole in a tree. Dr. Stark visited a nest at Boschfontein, near Balgowan, in Natal; it was in a hole, some 40 feet up, in the trunk of a large tree growing in a small piece of thick bush. The birds were stated to nest annually in the same place, and Mr. Hutchinson, who showed him the nest, believed that several females laid in the same hole, as more than one pair of birds visited the young ones.

The Woodwards also found a nest built of sticks in a large tree standing by itself on the high flat lands over the Ifafa river in Natal; in it were two young birds, one much larger than the other.

An egg taken by Colonel Bowker at Old Morley, a mission station in Tembuland, now in the South African Museum, is a somewhat elongated oval, tapering to a point. The shell is rather rough and thick; the colour was originally white, but is stained and dirty; it measures 2.95×1.80 .

Almost everywhere the natives of South Africa attach magical properties to this bird, chiefly connected with the production of rain. The Kaffirs of the eastern portion of the Colony, during times of severe drought, kill one by order of the "Rain Doctor." A stone

is then attached to its neck and it is flung into a vley, or sometimes into a river. The idea is that the bird having an offensive smell will make the water sick, and that in order to remedy this state of things rain will fall in great quantities, which will flush out the vley or river. The Ovampos also have a superstition about this bird. When Mr. Andersson asked one of their chiefs to obtain the eggs for him, he replied that it could not be done, as they were soft to the touch, and would fall to pieces on the least handling.

In captivity this bird makes a charming and delightful pet; it is very sociable, and loves to come and squat close to one and be caressed. It is most useful in a garden, as it spends a good deal of time searching for snakes, snails, caterpillars, worms, and grubs of all kinds, of which it is exceedingly fond. When it rests the whole length of the tarsus is applied to the ground, and the head is almost withdrawn between the capacious wings, so that only the beak protrudes. It is always hungry and will eat almost anything, from bread and butter to the entrails of fish and poultry; and when given a specially dainty morsel, will take it in its beak, and come with wings uplifted and wattle puffed out and show it to its master with much booming.

Genus II. BYCANISTES.

Type.

Bycanistes, *Cab. & Heine, Mus. Hein.* ii, p. 171

(1860)..... B. buccinator.

Bill rather short, deep and compressed, either with a large elevated, subcylindrical, compressed casque extending over the skull behind the eyes (as in the South African species), or with a rudimentary casque not rising above the culmen; head with a crest composed of long feathers; throat not naked; tail square, a little shorter than the wing; tarsus as in *Lophoceros*; plumage black and white. Nine species, all confined to Africa, are recognised by Shelley; only one, the type species, is found within our limits.

427. **Bycanistes buccinator.** *Trumpeter Hornbill.*

Buceros buccinator, *Temm. Pl. Col.* ii, p. 93, pl. 284 (1824).

Buceros buccinator, *Delagorgue, Voy. Afr. Austr.* i, p. 110 (1847) [Durban]; *Grill, K. Vet. Akad. Handl. Stockholm.* ii, no. 10, p. 45 (1858) [Knysna]; *Gurney, Ibis*, 1861, p. 133 [Natal]; *Kirk, Ibis*,

1864, p. 326 [Zambesi]; *Layard, B. S. Afr.* p. 226 (1867); *Sharpe, ed. Layard's B. S. Afr.* p. 125 (1875); *W. Ayres, Ibis*, 1887, p. 51 [Zoutspansberg]; *Shelley, Ibis*, 1888, p. 53.

Bycanistes buccinator, *Elliot, Monogr. Bucerot.* pl. 27 (1880); *Grant, Cat. B. M.* xvii, p. 421 (1892); *Shelley, B. Afr.* i, p. 113 (1896); *Woodward Bros. Natal B.* p. 101 (1899); *id. Ibis*, 1900, p. 520 [St. Lucia Lake]; *Alexander, Ibis*, 1900, p. 100 [Shupanga].
 "Ikanati" of Natal Zulus.

Description. Adult male.—General colour above, black glossed with dark green; a considerable crest, some of the feathers of which



FIG. 35.—*Bycanistes buccinator*. $\times \frac{1}{2}$.

are sometimes streaked with grey; edge of the wing, broad tips to the inner primaries, outer secondaries, slight tips to the inner secondaries, rump and upper tail-coverts, tips of all the tail-feathers except the central pair, white; ear-coverts silvery, rest of the head, throat, upper breast and sides of the body like the back; lower breast and rest of the under surface white.

Iris dark red; bill with a very large casque separated from the upper mandible anteriorly, knife-shaped in front reaching to the tip of the mandible, black; naked skin round the eye pinkish-flesh; feet black.

Length about 27·0; wing 11·5; tail 9·5; casque to tip 5·5; culmen of bill from notch 1·5; tarsus 1·8.

The female is smaller than the male (wing 10·5) and has a much smaller casque abruptly truncated about the middle of the length of the bill.

In the young bird there is scarcely a trace of the casque, which takes some months to develop.

Distribution.—The Trumpeter Hornbill is spread over the southern and eastern portions of Africa, from Knysna in Cape Colony through Natal, Nyasaland and German east Africa to Witu in British east Africa. The following are recorded localities within our limits: Cape Colony—Knysna, very rare (Victorin), King William's Town (Bt. Mus.), Port St. Johns (S. A. Mus.); Natal—near Durban (Delagorgue), Ifafa and St. Lucia Lake (Woodward), Karkloof near Maritzburg (S. A. Mus.); Transvaal—Oliphant's river in Zoutspansberg (W. Ayres); Portuguese east Africa—Shupanga on the Zambesi (Kirk and Alexander).

Habits.—The Trumpeter Hornbill frequents forest districts, where it is found in small flocks, which constantly resort to the same roosting place. It is a bird of strong and somewhat noisy flight and has a harsh, loud and complaining note, compared by some to the mewing of a cat, by others to the bleating of a lamb; Mr. W. Ayres syllables it thus "kor, kor, kor." This Hornbill appears to be almost entirely frugivorous and is especially fond of wild figs. The Woodward obtained two young birds from a nest in a tree growing on one of the krantzies on the Ifafa river in Natal, but no further details are given and we are at present without information as to whether the female is plastered up, as in the case of the members of the genus *Lophoceros*. One of the young birds belonging to the Woodward remained with them a long time, accompanying them on their journeys and devouring ravenously fruit, bread, mice, grubs or almost anything offered.

Genus III. LOPHOCEROS.

Type.

Lophoceros, *Hempr. & Ehr. Symb. Phys. Av.* (1833)... *L. nasutus*.

Bill moderate and curved, without or with only a small keel-shaped casque; a moderate crest of soft feathers; sides of the throat more or less naked but not wattled; tail long and usually square, about the same length as the wing; tarsus short, equal to or shorter than the middle toe and claw.

All the birds of this genus, so far as is yet known, nest in hollow trees, the female being imprisoned by the plastering up of the entrance-hole until incubation is completed.

Twenty-two species, all confined to Africa, are recognised by Shelley ; of these six are found within South African limits.

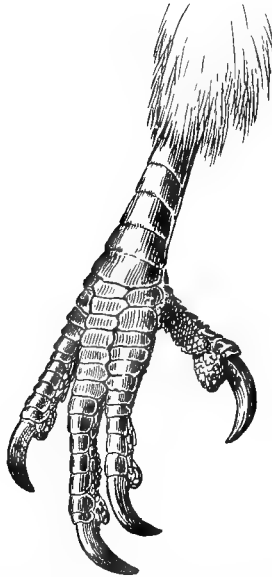


FIG. 36.—Foot of *Lophoceros melanoleucus*. $\times \frac{1}{4}$.

Key of the Species.

- A. Without a white streak down the centre of the back.
 - a. Outer tail-feathers slightly tipped with white, wing-coverts unspotted..... *L. melanoleucus*, p. 110.
 - b. Outer tail-feathers white with black bases only, wing-coverts spotted with white..... *L. monteiri*, p. 113.
- B. With a white streak down the centre of the back.
 - c. Outer tail-feathers slightly tipped with white, lower mandible with diagonal yellow lines *L. epirhinus*, p. 114.
 - d. Outer tail-feathers white except at the bases.

- a*¹. Bill red.
*a*². Sides of the head and neck greyish *L. erythrorhynchus*, p. 116.
*b*². Sides of the head and neck pure white..... *L. damarensis*, p. 117.
*b*¹. Bill yellow *L. leucomelas*, p. 118.

428. **Lophoceros melanoleucus.** *Crowned Hornbill.*

Buceros melanoleucus, *Licht. Cat. Rer. Nat. Rar.* p. 8 (1793).

Le Calao couronné, *Levaill. Ois. d'Afr.* v, p. 117, pls. 234, 235 (1806).

Buceros coronatus, *Shaw (nec Bodd.)*, *Gen. Zool.* viii, p. 35 (1811); *Layard's B. S. Afr.* p. 225 (1867); *id. Ibis*, 1869, p. 372 [George].

Tockus melanoleucus, *Gurney, Ibis*, 1862, p. 157 [Natal]; *id. Andersson's B. Damaraland*, p. 208 (1872); *Sharpe, ed Layard's B. S. Afr.* p. 127 (1875); *Elliot, Mon. Bucerot.* pl. 49 (1880); *Schönland, Trans. S. A. Phil. Soc.* ix, p. 1 (1897).

Lophoceros melanoleucus, *Shelley, Ibis*, 1888, p. 61; *Grant, Cat. B. M.* xvii, p. 399 (1892); *Shelley, B. Afr.* i, p. 114 (1896); *Woodward Bros. Natal B.* p. 98 (1899); *Alexander, Ibis*, 1900, p. 100 [Zambesi].

"Toucan" of the Colonists. "Umkolwana" of Zulus (Woodward).

Description. *Adult.*—Head, which is slightly crested, brownish-black, some of the feathers above the eye, on the cheeks and nape with white centres giving a mottled appearance; ear-coverts silvery;

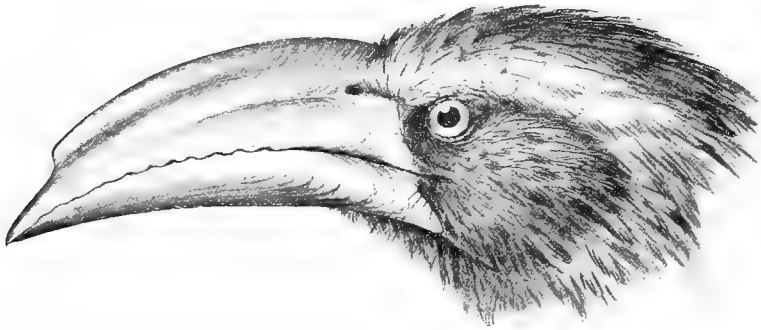


FIG. 37.—*Lophoceros melanoleucus.* × $\frac{2}{3}$.

back, wings and tail dark brown, central and outer pair of tail-feathers slightly, others broadly tipped with white; wing-quills slightly edged with buffy-white; below, throat, chest and sides of the body blackish-grey, rest of the under parts pure white.

Iris yellow; bill with casque (which extends more than three-quarters the length of the bill) red, darker along the cutting edge and with a yellow band at the base of the upper and lower mandible; legs and feet dark brown.

Length about 23·0 (in flesh 20·6, Alexander); wing 9·6; tail 8·60; culmen with casque 2·40, without ·90; tarsus 1·50.

The female resembles the male but is slightly smaller; the young birds of both sexes have the central and outer pair of tail-feathers dark brown with pale buff margins; the casque is but slightly developed and the bill is orange or yellow.

Distribution.—The Crowned Hornbill is found throughout the southern and eastern portions of the Colony and extends along the eastern coast up to the Zambesi valley, where it is common; it was obtained by Andersson in Ovampoland. North of the Zambesi this bird ranges to Angola on the west, Unyoro in the centre and Kili-manjaro and Mombasa on the east.

The following are recorded localities: Cape Colony—George (Atmore), Knysna (Layard), Albany (Schönland), Stockenstroom (Atmore), Peddie (S. A. Mus.), Port St. John's, in Pondoland (S. A. Mus.); Natal—Ifafa (Woodward), Pinetown (Brit. Mus.); Swaziland (Brit. Mus.); Portuguese east Africa—Zambesi valley (Alexander).

Habits.—The Crowned Hornbill is found chiefly in forest country where it frequents high trees; it associates in parties of from ten to twenty individuals, except during the breeding season. They float rather than fly with an easy graceful motion from tree to tree, giving vent to a shrill rather squeaky alarm note as they go. Their food consists chiefly of locusts and caterpillars but they are also fond of fruit in the season, and devour a good many bananas and tomatoes; like the Brom-vogel they pick up their food with the tips of their mandibles, then give their head a toss in the air, throw up the morsel, catch it, and swallow it as it comes down again.

Like nearly all other arboreal hornbills, the nidification of which has been investigated, the female of this species is enclosed in a hollow tree during incubation and is fed by the male at frequent intervals. Mrs. Barber, a correspondent of Mr. Layard, first noticed this curious habit in the case of this bird, but perhaps the most complete account is given by Dr. Schönland, who has had many opportunities of examining nests at various stages of the process.

Nests have been found in various trees; *Euphorbia grandidens*,

Sideroxylon inerme and *Schotia speciosa*, are those perhaps most frequently made use of. A hollow of considerable size is necessary to contain so large a bird, and under usual circumstances the mode of access to the interior is by an accidental hole large enough for the bird to pass in; this hole is afterwards plastered up by the birds, except for a narrow slit through which the female, who is now inside, is able to pass the tip of her bill to receive food from the male outside.

Another exceptional arrangement has been described by Schönland; in this case the tree selected, a *Euphorbia*, was a hollow chimney throughout its length, and at a convenient distance below a natural crack, which was to serve as a feeding hole, a floor was constructed upon which the eggs were laid; while about three feet above the feeding crack a ceiling was put in; this latter being constructed of bits of an aloe stem glued together by cement; thus the hen bird is completely enclosed. There can be little doubt that the cement used for plastering up the holes and forming the platforms is chiefly composed of the droppings of the birds; it usually contains the wing cases and legs of insects such as form the greater part of their food, and moreover, an examination of the contents of the lower part of the intestines of a recently killed bird showed that these much resembled the cement used. It is probable that both male and female birds take part in the cementing process, though observations are still required on this point.

The female before entering the nest begins to moult, and during her imprisonment, which probably lasts seven or eight weeks, the process continues, so that she is often helpless and unable to fly when she comes out; it does not appear to be true, however, that she is weak and exhausted by her duration as she is generally found to be very fat, and, moreover, the male is very assiduous in bringing food constantly.

The eggs, three to four in number, are laid in December or January and are pure white, rough, unpolished, and rather elongated. One question not yet definitely settled is whether the female leaves the nest before the young are fully fledged. Dr. Schönland thinks that she does, as he has received late in the season two nests plastered up and intact, both of which contained only young birds. This is further corroborated by the observation of several people that they have seen two birds flying away from one nest, and which were supposed by them to be males, but which were probably a pair, the young birds remaining imprisoned in the nest. It seems most

probable, therefore, that after the female has been released from her imprisonment the young birds are again sealed up and fed by both parents until they are able to take care of themselves.

429. **Lophoceros monteiri.** *Monteiro's Hornbill.*

Toccus monteiri, *Hartlaub, P. Z. S.* 1865, p. 87, pl. 5; *Gurney in Andersson's B. Damaraland*, p. 208 (1872); *Sharpe, ed. Layard's B. S. Afr.* p. 129 (1875); *Elliot, Monog. Bucerot.* pl. 53 (1877).

Lophoceros monteiri, *Shelley, Ibis*, 1888, p. 62; *Grant, Cat. B. M.* xvii, p. 403 (1892); *Shelley, B. Afr.* i, p. 114 (1896).

Description. *Adult male.*—Head, neck, throat and breast ashy-black, slightly marked with white streaks on the occiput, and with black centres to the feathers on the neck and breast; mantle, back, inner secondaries and wing-coverts brown, most of the latter with rounded spots at the tips of the feathers giving the wings a variegated appearance; primary quills black with a few spots of white, outer secondaries white; the two pairs of central tail-feathers dark ashy-black, the next pair white with black bases, the two outer pairs wholly white; below, from the breast downwards, white.

Bill long and much curved, without definite indication of a casque, yellowish-red, darkest towards the extremities of the mandibles which are dark purple; iris nut-brown; legs and feet brown-horn.

Length about 26; wing 8·5; tail 9·5; culmen 5·0; tarsus 1·9. The female resembles the male but is distinguished by its much smaller beak, measuring 3·5 to 4·0 along the culmen.

Distribution.—This Hornbill was first obtained by Monteiro in Benguela, whence it extends south of the Cunene into Damaraland, where, however, it is not very common according to Andersson. Definite localities are Otjimbingue (Andersson in *Bt. Mus.*), and Omaruru in Ovampoland in February and November (Eriksson in *S. A. Mus.*).

Habits.—Mr. Andersson gives the following account. "This bird is usually seen in pairs; but occasionally half a dozen individuals may be found in close proximity to one another. It is a shy and wary bird, and difficult to approach, except on hot days, when it appears to suffer a good deal from the heat. About 8 or 9 o'clock in the morning it may often be observed quietly resting on the top of a tree; and it will also perch in such situations at other

times when alarmed, but takes its departure again on the least sign of danger. It seldom flies far at a time, but if closely pressed extends its flight each time it is dislodged and soon distances its enemy. The flight of this and other Hornbills is not unlike that of a Woodpecker, dipping and rising alternately. The present species feeds on flowers, young shoots, berries, birds' eggs and insects; and, in fact, little comes amiss to it. I have found much gravel in the stomach, and have often flushed it from the ground, to which it resorts for the purpose of picking up sand as well as food."

430. **Lophoceros epirhinus.** *South African Grey Hornbill.*

Buceros epirhinus, *Sundev. Ofvers. K. Vet. Akad. Forh.* 1850, p. 108 (1851).

Buceros nasutus, *Ayres (nec Linn.)*, *Ibis*, 1871, p. 260 [Limpopo]; 1879, p. 294 [Rustenburg].

Tockus nasutus, *Gurney in Andersson's B. Damaraland*, p. 206 (1872); *Buckley, Ibis*, 1874, p. 365 [Bamangwato]; *Sharpe, ed. Layard's B. S. Afr.* p. 133 (1875).

Lophoceros nasutus, *Elliot, Monog. Bucerot.* pl. 47 (1877).

Lophoceros epirhinus, *Holub & Pelz. Orn. Süd-Afrikas*, p. 140 (1882); *Shelley, Ibis*, 1888, p. 64; *Grant, Cat. B. M.* xvii, p. 408 (1892); *Shelley, B. Afr.* i, p. 498 (1896); *Sharpe, Ibis*, 1897, p. 498 [Zululand]; *Woodward Bros. Natal B.* p. 100 (1899); *Alexander, Ibis*, 1900, p. 101 [Zambesi]; *Marshall, ibid.* p. 249 [Mashonaland].

Description. *Adult male.*—Head dark ashy with black shaft-streaks bordered on either side by a broad white eyebrow; mantle, back, wings and tail brown; an ill-defined pale central streak down the middle of the back; wing-coverts and secondaries edged with pale buffy-white on both webs, primaries on the outer web only; central pair of tail feathers not tipped with white, outer pair slightly, others strongly so tipped; below, dark ashy with black shaft stripes on the throat, cheeks and ear-coverts gradually fading on the lower breast to pure white on the abdomen and lower tail-coverts; bill with a small but well-developed casque separated at its tip from the upper mandible and obtusely pointed; the edges of both mandibles scalloped; colour black, a pale yellow streak on the upper mandible above the cutting edge and three or four narrow diagonal yellow lines on the lower mandible.

Iris reddish-brown; legs and feet black.

Length about 18·0; wing 8·3; tail 8·0; culmen with casque 3·1, without 1·25; tarsus 1·25.

A female is similar in plumage but slightly smaller (wing 7·5); the bill also is smaller; there is no casque, the distal portion is red, the base of the upper mandible pale yellow, the lower, black with three diagonal yellow streaks.

In a young bird the upper mandible is tawny-white except the tip, which with the lower mandible is reddish-brown (Ayres).

Distribution.—The type of this species was obtained by the Swedish traveller Wahlberg in lat. 24° S., probably in the neighbourhood of the upper Limpopo, as the bird is not found south of the Vaal river. It is spread through the bush country of the Transvaal to Damaraland, Mashonaland and Zululand. North of our limits it extends to Angola, Nyasaland and German east Africa. It is replaced in west and north-east Africa by a very closely-allied species, which only differs in being without the casque on the beak.

The following are recorded localities: Zululand—Ulundi (Woodward); Transvaal—Lydenburg dist. (Francis in S. A. Mus.), Rustenburg (Ayres); Bechuanaland—Kanye (Exton), Mangwato, (Buckley); Rhodesia—Victoria Falls (Holub), Mashonaland common (Marshall); German south-west Africa—Ovanquenyama, Ondonga, and Otjimbingue (Andersson in Bt. Mus. and S. A. Mus.), Sesheke (Holub); Portuguese east Africa—Zambesi, rare (Alexander).

Habits.—The Grey Hornbill is usually found in small companies of about half a dozen birds; it roosts at night and rests during the day in large trees if they are available, and usually selects a branch for this purpose about half-way up rather than one of the topmost ones. Its flight is a dipping one, consisting of alternate periods of rising with flapping wings, and a floating through the air without movement of the wings. This bird feeds on fruits, seeds, young shoots, as well as on insects of all sorts, and often descends to the ground, probably to get the insect portion of its meals. It has a shrill mewing cry, generally heard when on the wing; Ayres states that it has also a sweet song like that of a thrush, but it seems probable that Ayres was mistaken in this matter. Andersson states that in common with the rest of the genus it appears to suffer very much from heat during the most trying season of the year, when it may be found perching at noon in the shadiest part of the forest gasping as if for breath. No observations have hitherto been made on its nesting habits.

431. **Lophoceros erythrorhynchus.** *Red-billed Hornbill.*

Le Toc, *Levaill. Ois. d'Afr.* v, p. 122, pl. 238 [Senegal].

Buceros erythrorhynchus, *Temm. Pl. Col.* ii, sp. 19 (1823); *Ayres, Ibis*, 1869, p. 296 [Limpopo].

Tookus erythrorhynchus, *Livingstone, Missionary Travels*, p. 613 (1857); *Kirk, Ibis*, 1864, p. 327 [Zambesi]; *Gurney in Andersson's B. Damaraland*, p. 211 (1872) [in part]; *Buckley, Ibis*, 1874, p. 365 [Semokwe river]; *Sharpe, ed. Layard's B. S. Afr.* p. 131 (1875); *Elliot, Monogr. Bucerot.* pl. 56 (1878); *Holub & Pelz. Orn. Süd-Afrikas*, p. 141 (1882); *Ayres, Ibis*, 1886, p. 289 [Limpopo]; *Bryden, Gun and Camera*, p. 71 (1893).

Lophoceros erythrorhynchus, *Shelley, Ibis*, 1888, p. 65; *Grant, Cat. B. M.* xvii, p. 409 (1892); *Shelley, B. Afr.* i, p. 115 (1896); *Alexander, Ibis*, 1900, p. 101 (Zambesi).

“Korwe” of the Bechuanas (Livingstone).

Description. Male.—Crown of the head dark ash-grey, lores and eyebrow white with dark shafts; ear-coverts, sides of the face and neck white edged with grey, nape and a stripe from the nape to the centre of the back white, lower back, tail-coverts, secondaries and wing-coverts brown, the latter with conspicuous white spots at the tips of the feathers; primaries very dark brown, spotted with white on the inner and outer web except the first two and eighth, which are spotted on the outer web only; outer secondaries brown with increasing amounts of white on both webs; central pair of tail-feathers dark brown, second pair black, third and fourth pair with the basal half black the terminal half white, fifth pair white except for a trace of brown at base; below, including the under wing- and tail-coverts white, throat very thinly covered with feathers showing the bare skin.

Iris light yellow; bill with no trace of a casque, red, at the base of the lower mandible black; naked skin round the eye and on the throat yellow; legs and feet dark brown.

Length 18·5; wing 7·5; tail 8·2; culmen 3·6; tarsus 1·6.

The female is slightly smaller and has a shorter bill.

Distribution.—The Red-billed Hornbill is widely spread over Africa from the Gambia and Abyssinia southwards to the Zambesi; within our limits it is found in the extreme north of German south-west Africa in Ovampoland, in Matabeleland, the Bechuanaland Protectorate and the western Transvaal and along the Zambesi valley, but not, so far as is now known, in Mashonaland or the eastern Transvaal.

The following are recorded localities: Transvaal—Rustenburg district (Ayres); Bechuanaland—Kolobeng near Kanye (Livingstone); Rhodesia—Tati river (Holub), Semokwe river between Tati and Bulawayo (Buckley)—German south-west Africa—Ondonga and Elephant Vley (Andersson in Bt. Mus.); Portugese east Africa—Tete (Kirk in Bt. Mus.) and Chicowa (Alexander), both on the Zambesi.

Habits.—These birds are found in small flocks and are shy and wary. Alexander states that they resort to the river (Zambesi) every morning and evening, retiring to spend the middle of the day in thick shade as they appear to dislike the heat very much. Their flight is characteristic. A few rapid beats of the primaries and then follows a long glide through the air without the slightest motion of the wings; each flight is always directed straight towards the tree for which the bird is making. They feed like other hornbills on both fruits and insects, and in the winter time when fruit is scarce have been noticed by Ayres digging in the ground for bulbous roots along the banks of the Limpopo, in company with Francolins, Babblers and Spreuws.

Dr. Livingstone first described the breeding habits of this Hornbill; he noticed it nesting in holes in mopani and other trees, both at Kolobeng, a mission station in what is now the Bechuanaland Protectorate, and during his journey down the Zambesi. From his account it does not appear that the Red-billed Hornbill differs essentially from the Crowned Hornbill in this respect.

432. *Lophoceros damarensis.* *Damaraland Hornbill.*

Buceros erythrorhynchus (*nec Temm.*), *Lagard, B. S. Afr.* p. 227 (1867).

Tockus erythrorhynchus, *Gurney in Andersson's B. Damaraland*, p. 211 (1872) (in part).

Lophoceros damarensis, *Shelley, Ibis*, 1888, p. 66; *Grant, Cat. B. M.* xvii, p. 411, pl. xiv (1892); *Shelley, B. Afr.* i, p. 115 (1896).

Description.—Closely resembling *L. erythrorhynchus*, except that the head and neck are pure white without any admixture of grey and the crown has some blackish-grey feathers mixed with the white.

Length 19·0; wing 7·9; tail 8·0; tarsus 1·7; culmen 3·35.

Distribution.—This species replaces the *L. erythrorhynchus* in Damaraland proper, the latter occurring only in Ovampoland. The type obtained by Andersson now in the British Museum is from

Otjimbingue; other localities are Schmelen's Hope (Andersson in Bt. Mus.) and Omaruru, whence the South African Museum possesses three examples procured by Mr. A. W. Eriksson.

433. **Lophoceros leucomelas.** *Yellow-billed Hornbill.*

Buceros leucomelas, *Licht. Verz. Säugeth. u. Vög.* p. 17 (1842).

Buceros flavirostris (*nec Rüpp.*), *Ayres, Ibis*, 1871, p. 260; 1879, p. 295 [Magaliesberg].

Tockus flavirostris, *Gurney in Andersson's B. Damaraland*, p. 210 (1872); *Buckley, Ibis*, 1874, p. 365; *Shelley, Ibis*, 1875, p. 82 [Natal]; *Sharpe, ed. Layard's B. S. Afr.* pp. 130, 808 (1875-84); *Elliot, Monogr. Bucerot.* pl. li (1877); *Oates, Matabeleland*, p. 304 (1881); *Holub & Pelz. Orn. Süd-Afrikas*, p. 141 (1882).

Lophoceros leucomelas, *Shelley, Ibis*, 1888, p. 67; *Grant, Cat. B. M.* xvii, p. 414; *Shelley, B. Afr.* i, p. 115 (1896); *Sharpe, Ibis*, 1897, p. 498; *Woodward Bros. Natal Birds*, p. 100 (1899); *Alexander, Ibis*, 1900, p. 102 [Zambesi]; *Marshall, ibid.* p. 250 [Mashonaland].

"Mkoto" in the eastern Transvaal (Francis).

Description. *Adult male.*—Crown of the head ashy-black with black streaks; lores, eyebrows, sides of the head and neck pearly-grey with fine black shaft-lines; mantle and back brownish-black, with a white stripe down the centre of the upper half; wing-coverts like the back, with large rounded spots towards the tips of the feathers; primary quills black, with a small white spot on the outer web of the third to seventh; the first four secondaries are black, the fifth is edged with white, the sixth and seventh are almost entirely white, the others brown with a white edging; the two pairs of central tail-feathers are black throughout, the third pair with the terminal third only white, the fourth and fifth with the increasing amount of white, with sometimes traces of a black cross band; below, the few feathers on the throat are grey, the breast is also grey, with very distinct black streaks on the sides of the feathers, the lower breast and rest of the under parts pure white.

Iris yellowish-white; bill, without defined casque, yellow; along the cutting edges of the mandibles and at the tip dark purplish-red; naked skin round the eye and on the throat dark pink (yellow in the dried skin).

Length about 19·0; wing 7·4; tail 8·1; culmen 3·1; tarsus 1·8.

The female resembles the male, but is smaller, wing 6·6; culmen 2·75. Immature birds are darker than the adults.

Distribution.—This species is confined to Africa south of the Zambesi, being replaced north of that river by the closely-allied *L. flavirostris*, distinguished by its black-shafted breast feathers. It is spread over Natal, the bush country of the Transvaal, Bechuanaland, Mashonaland and Damaraland, but is stated to be rare in the Zambesi valley by Alexander. The following are recorded localities: Natal—east of Umgeni River (Shelley), Ulundi in Zululand (Woodward); Transvaal—Lydenburg Bush Country (Francis in S. A. Mus.), Rustenburg district (Ayres); Bechuanaland—Molopo river (Exton in S. A. Mus.), Kanye (Exton in Bt. Mus.), and Macloutsie river (Oates); Rhodesia—Salisbury district (scarce, Marshall); German south-west Africa—Otjimbingue, Schmelen's Hope and Great Namaqualand (Andersson in Bt. Mus.), Omaruru (Eriksson in S. A. Mus.); Portuguese east Africa—Zambesi valley, rare (Alexander).

Habits.—Mr. Andersson states as follows: "This species is the most common of the Hornbills in middle and southern Damaraland. It is found singly or in pairs, and being a comparatively fearless bird is easily killed, especially during the heat of the day, when it invariably perches on or near the top of a lofty tree, and will remain for hours in this situation, keeping up, with short intermissions, a kind of subdued chattering note of 'toc toc toe, tocky tocky tocky toc,' in a tone not unlike the yelping of young puppies, and accompanied at intervals by a flapping and raising of its wings and an alternate lowering and erecting of its head."

Like other Hornbills it feeds on fruits and seeds, as well as insects, and Mr. Marshall especially remarks on the way it opens the huge pods of a large leguminous tree with its very powerful bill.

Mr. Eriksson's note book gives the following details about the breeding habits of this bird on the Limpopo river, near its junction with the Marico, in what forms part of the Rustenburg district of the Transvaal: "November 27. A bushman brought a hen bird with one egg; shortly afterwards she laid another, the first was white, covered all over with a light brown stain; the second was covered with blood, which was drying up, but came off by washing. I could not wash the first egg white. The nest, as usual, was in a hollow tree, and although it only contained one egg the male had masoned up the entrance, only leaving a small hole through which to

feed his mate. The female had not yet lost any of her wing or tail-feathers. November 28. One of my herds brought another female Hornbill with two eggs; she had lost all her quills and tail-feathers, and the new ones were about an inch long; eggs much incubated. December 13. Some bushmen came to-day with three females, two eggs and six young birds, the mother of the two eggs still retained her tail and wing-quills, although the eggs were partially incubated, but the other two had moulted, and while the young feathers of the tails were about half an inch in length nothing could be seen of those of the wings."

Suborder IV. TROGONES.

Two toes (third and fourth) forwardly, two (first and second) backwardly directed; of the deep plantar tendons the anterior, the

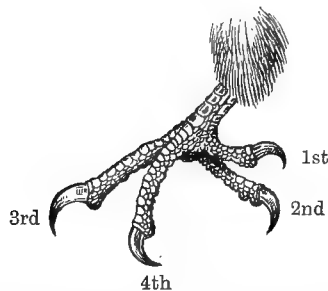


FIG. 38.—Left foot of *Hapaloderma narina*, toes numbered. $\times \frac{1}{2}$.

flexor perforans digitorum, supplies the third and fourth toes, the posterior, the flexor longus hallucis, supplies the first and second, and the two tendons are connected by a vinculum (fig. 2, p. 2); palate schizognathous (fig. 4, p. 4); the spinal feather tract is defined from the neck to the oil gland and is not forked; the oil gland is nude; cæca are present; the ambiens muscle is absent.

Family I. TROGONIDÆ.

The characters of this, the only family, are included in those of the suborder.

The members of this family are chiefly found in tropical America. One genus is widely spread over the Oriental region, and another throughout the Ethiopian.

Genus I. **HAPALODERMA.**

Type.

Apaloderma, Swains. *Class. B.* ii, p. 337 (1837).....H. narina.

Hapaloderma, Agass. *Index Universal.* p. 172 (1846).....H. narina.

Bill stout and short, edge of the upper mandible usually toothed, nostrils concealed by the overhanging bristles; face feathered; tail of twelve feathers long and graduated, the three central feathers purplish or greenish, without subterminal black bars.

This genus, containing three species only, is confined to Africa south of the Sahara.

434. **Hapaloderma narina.** *Narina Trogon.*

Couroucou narina, *Levaill. Ois. d'Afr.* v, p. 104, pls. 228-9 (1806).

Trogon narina, *Stephens, Gen. Zool.* ix, p. 14 (1815); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 44 (1858) [Knysna].

Apaloderma narina, *Swains. Class. B.* ii, p. 337 (1837); *Layard, B. S. Afr.* p. 61 (1867); *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 62 (1882).

Hapaloderma narina, *Kirk, Ibis*, 1864, p. 323 [Zambesi]; *Verreaux, P. Z. S.* 1871, p. 41; *Gurney, Ibis*, 1873, p. 254 [Durban]; *Shelley, Ibis*, 1875, p. 68 [Durban]; *Gould, Monogr. Trogons*, 2nd ed. pl. 34 (1875); *Sharpe, ed. Layard's B. S. Afr.* p. 106 (1875); *Grant, Cat. B. M.* xvii, p. 477 (1892); *Rendall, Ibis*, 1896, p. 167 [Barberton]; *Shelley, B. Afr.* i, p. 108 (1896); *Sharpe, Ibis*, 1897, p. 497 [Zululand]; *Woodward Bros. Natal B.* p. 102 (1899).

"Bosch-Lourie" of Dutch, "Umjenimengu" of Zulus.

Description. *Adult male.*—Head, chest, back and upper wing-coverts green with a metallic gloss, outer greater-coverts dark brown edged with green, inner ones and inner secondaries delicately vermiculated with black and white; primary quills black, margined on the outer web with white, tail-feathers bluish-green, the three outer pairs largely white for their distal halves; below from the breast to the under tail-coverts bright crimson; sides of the body and thighs ashy-grey.

Iris hazel; bill light ash; legs and feet dark flesh.

Length 11.5; wing 5.0; tail 6.5; culmen 0.6; tarsus 0.5.

The female differs from the male in having the forehead, sides of

the head, throat and chest a yellowish-brown instead of green, shading on the lower breast through lilac to carmine on the abdomen; iris brown, bill dark brown on the upper mandible and base of the lower, rest yellow; wing 4.80.

In young birds the vermiculations of the inner secondaries are spread over a considerable portion of the wings; the breast is also transversely barred with dusky.

Distribution.—This Trogon was first discovered by Levillant in the forests of Outeniqua and along the Gamtoos river, now in the districts of Knysna and Humansdorp of the Colony. From here it is spread along the more wooded parts of the Colony, Natal and Zululand, extending through Nyasaland and German east Africa to

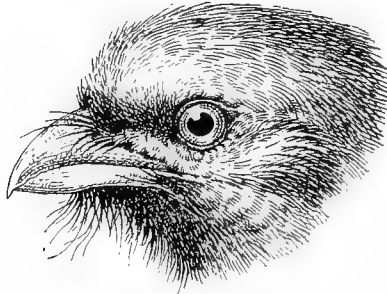


FIG. 39.—*Hapaloderma narina*. $\times \frac{1}{4}$.

southern Abyssinia. On the west coast it reappears in Angola, though not hitherto recorded from German south-west Africa.

The following are localities: Cape Colony—Knysna (Victorin), Peddie (S. A. Mus.), Port St. John's (S. A. Mus.); Natal—near Durban (Ayres), Pinetown (Shelley), Echowe and Umgoye in Zululand (Woodward); Portuguese east Africa—Zambesi valley, scarce (Kirk); Rhodesia—Junction of Chobe and Zambesi (Holub).

Habits.—The Narina, so called by Levillant after a Hottentot beauty for whom he professed great admiration, is found only in thick bush, where it creeps about or sits motionless and voiceless in a very upright position with its head closely drawn down on to its shoulders; it is usually solitary though two or three birds may now and then be found together. Its note to which it only gives vent during the breeding season is loud, monotonous and mournful, and is also somewhat ventriloquial, so that although the bird may be

close at hand, it sounds as if it was some distance off. It is usually heard during the midday hours. The Narina lives chiefly on insects though it is said to eat fruit also; the Woodwards state that they have seen these birds pursue and catch insects on the wing, and have found beetles and caterpillars in their stomachs.

Levaillant states that they nest in a hole in a tree, where they lay four rounded eggs, white with a rosy tinge, as owing to the fragile and delicate nature of the shell the yolk shows through; incubation lasts twenty days, and the young are hatched in a very advanced condition and are able to follow their parents at once.

The Woodwards are the only modern observers who appear to have investigated the nesting habits of the Narina; they confirm Levaillant but do not mention the precocious nature of the newly-hatched young.

The skin of this bird is very thin and delicate and the feathers are very loosely attached to it, so that it is a most difficult bird to preserve, moreover if exposed to light the bright red colour of the under parts quickly fades.

Mr. Jules Verreaux states that the red colouring matter like that of the Touracos, is easily washed out by water, and that during wet weather it fades to a pale pink; but that the rich red colour soon reappears when the plumage of the bird again dries.

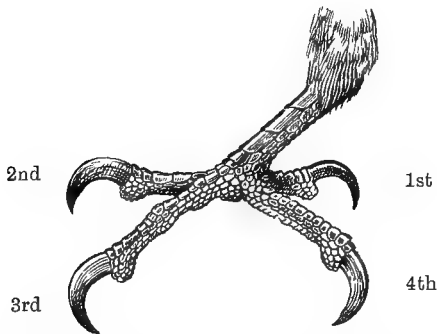


FIG. 40.—Left foot of *Campothera smithi*. Toes numbered. $\times \frac{1}{2}$.

Suborder V. ZYGODACTYLI.

Second and third toes anteriorly, first and fourth posteriorly directed; flexor perforans digitorum leading only to the third digit,

the flexor longus hallucis first sending a tendon to the other plantar then a second to the fourth digit, then to the other two, first and second (fig. 2 *d*, p. 2); spinal feather tract well defined on the neck but forked on the lower back; ambiens and accessory femoro-caudal muscles absent.

In addition to the families of which there are South African representatives, the Toucans (*Rhamphastidae*), Jacamars (*Galbulidae*), and Puff-birds (*Bucconidae*), all confined to the neotropical region, belong to this suborder.

Family I. PICIDÆ.

Bill generally strong and often modified into a cutting weapon; nostrils basal; above them, in most genera, runs a ridge parallel to the culmen joining or nearly joining the commissure; tongue excessively long, wormlike, and capable of great protrusion; it is supplied with viscid mucous from the large salivary glands so that insects adhere to it; the point of the tongue is horny and barbed; the hyoid cornua of enormous length, sliding round the skull and passing into a sheath from the sides of the gullet round the occiput to the base of the upper mandible; feet zygodactyle, *i.e.*, second and third digits turned forwards, the first and fourth backwards; four toes in all South African species but the hallux absent in some exotic genera; tail-feathers 12, outer pair short and usually concealed by the coverts; eggs white, laid in holes in trees excavated by the birds themselves.

Palate schizognathous; vomer slender, pointed and split; oil-gland tufted; no cæca.

The Woodpeckers are spread all over the temperate and tropical regions of the world except Madagascar, Australia and Polynesia. They all (with one exception) lay white eggs in holes bored in trees, making no nest other than the chips of wood.

Key of the Genera.

- A. Tail-feathers with the shafts stiffened and spiny.
 - a. Outer anterior toe longer than the outer posterior toe.
 - a¹. Difference between the primaries and secondaries about equal to half the culmen; habits terrestrial; shafts of tail-feathers brown *Geocolaptes*, p. 126.

- b¹. Difference between the primaries and secondaries almost equal to the length of the culmen; habits arboreal; shafts of tail-feathers bright yellow..... *Campothera*, p. 128.
 b. Outer anterior toe shorter than the outer posterior toe.
 a¹. Bill shorter than the head, plumage spotted and barred *Dendropicus*, p. 135.
 b¹. Bill longer than the head.
 a². Plumage spotted and barred, yellow shafts to tail-feathers *Thripas*, p. 137.
 b². Plumage not spotted or barred (in South African species); shafts of tail-feathers brown or black *Mesopicus*, p. 139.
 B. Tail-feathers soft and rounded, not spiny; plumage speckled grey *Iynx*, p. 142.



FIG. 41.—Tail of *Campothera smithi*. $\times \frac{1}{2}$.

Subfamily I. PICINÆ.

Tail-feathers with very stout and stiff shafts ending in stiff points, used as a support when climbing tree trunks and hammering the bark for insects.

Genus I. **GEOCOLAPTES.***Type.***Geocolaptes**, *Swains. Faun. Bor. Am. Birds*, p.315 (1831) *G. olivaceus*.

Bill stout and strong with no nasal shelf, culmen slightly curved; nostrils more or less concealed by the nasal bristles; wing rounded, primaries short, only exceeding the secondaries by about half the length of the culmen; tarsus long and strong, slightly exceeding the outer posterior toe, which is shorter than the outer anterior toe; tail spiny, short and stiff with brown shafts. This genus contains only one species, of terrestrial habits, confined to South Africa.

435. **Geocolaptes olivaceus.** *Ground Woodpecker.**Picus olivaceus*, *Gmel. Syst. Nat.* i, p. 431 (1788).Le Pic Laboureur, *Levaill. Ois. d'Afr.* vi, p. 27, pls. 254, 255 (1808).*Picus terrestris*, *Burchell, Travels*, i, p. 245 (1822).*Geocolaptes arator*, *P. L. Sclater, P. Z. S.* 1866, p. 22 [Windvogelberg].*Colaptes olivaceus*, *Layard, B. S. Afr.* p. 239 (1867).*Geocolaptes olivaceus*, *Gurney, Ibis*, 1868, p. 462 [Mooi river]; *Buckley,**Ibis*, 1874, p. 368 [Transvaal]; *Sharpe, ed. Layard's B. S. Afr.* pp.187, 812 (1875-84); *Butler, Feilden, and Reid, Zool.* 1882, p. 208[Upper Natal]; *Hargitt, Ibis*, 1883, p. 403; *Symonds, Ibis*, 1887, p.330 [Kroonstad]; *Hargitt, Cat. B. M.* xviii, p. 9 (1890); *Shelley, B.**Afr.* i, p. 130 (1896); *Woodward Bros. Natal B.* p. 103 (1899).

Description. *Adult male.*—Above, olive-brown, the feathers crossed with narrow white bars which are more conspicuous on the wings; crown, nape and sides of the head including the ear-coverts ashy-grey; primary quills dusky barred with dull white; rump washed with crimson; upper tail-coverts and tail-feathers olive barred with dull white, pointed and tipped with a reddish tinge; throat dull white bordered on either side by a malar stripe of grey feathers with crimson tips, breast dull olive washed with crimson, most strongly on the lower portion; abdomen, thighs and lower tail-coverts olive barred with dull white; tail-feathers below, strongly washed with golden-yellow.

Iris white, sometimes with tinge of yellow or red; bill black; legs and feet black or ashy.

Length about 11.5; wing 5.2; tail 3.6; tarsus 0.92; culmen 1.5.

The female resembles the male, but the malar region is not marked with red spots.

Iris dark red according to Buckley.

The young birds resemble the adults of their respective sexes, but are less brightly coloured, especially on the rump and under parts where the crimson is only a slight blush; the under parts being further mottled and transversely varied with olive-dusky and buffy-white.

Distribution.—This bird is confined to the dryer and more mountainous districts of the Colony and Natal, extending as far as the “high veld” of the Transvaal. It has not hitherto been noticed north of the Limpopo.

The following are recorded localities: Cape Colony—Cape, Stellenbosch, Paarl, Tulbagh, Worcester, and Caledon divisions

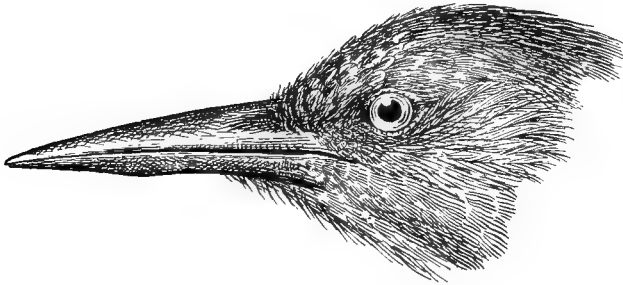


FIG. 42.—*Geocolaptes olivaceus*. $\times \frac{1}{2}$.

(S. A. Mus.), Colesberg (Layard), Windvogelberg in the Cathcart div. (Boulger); Natal—Maritzburg (Bt. Mus.), Mooi river (Ayres), and Newcastle (Butler, Bt. Mus.); Orange River Colony—Kroonstad (Symonds); Transvaal (Buckley).

Habits.—This bird, unlike all other Woodpeckers, lives almost entirely on the ground; it is usually to be found only among the rocky boulder-strewn and treeless hills, with which so large a portion of South Africa is covered; here it is to be seen wandering about in small parties of from six to a dozen birds, except during the breeding season. Among the barren hills of the south-western part of the Colony it frequently associates with the rufous rock babbler (*Chaetops frenatus*); at night it roosts in holes and crevices among rocks. Occasionally these birds perch on low branches of tree

and shrubs, Symonds noticed them on the lowest branches of the mimosa trees near Kroonstad, and Stark flying from one Protea bush to another in the French Hoek mountains of the Paarl division. Their note is loud and not unmelodious, though Burchell compares it to the sound made by filing the teeth of a saw; their food consists entirely of ground-living insects of various kinds which they search for with their strong beaks in the crevices of rocks and underneath stones; they appear to be early breeders throughout their range; Stark found a nest on August 12 near Wellington, and Butler one on August 2, near Newcastle in Natal; a bank is usually chosen, into which is bored a tunnel running slightly upwards from the entrance, for about eighteen inches to several feet; at the end of this, in a slight depression without any nest, are laid 4-5 white eggs, somewhat rounded in shape and measuring about 1.0 × 0.85.

Genus II. **CAMPOTHERA.**

Type.

- Dendromus** (*nec* Smith, 1829), *Swains. Class. B.* ii,
p. 307 (1837) *C. maculosa.*
- Campothera**, *Gray, List Gen. B.*, p. 70 (1841)..... *C. maculosa.*

Bill moderate with a distinct though narrow nasal shelf, its breadth at the base of the bill less than the distance between its outer edge and the cutting edge of the mandible; nostrils concealed by the nasal bristles; wing pointed, the difference between the primaries and the secondaries almost equalling the length of the culmen; tarsus short, equal to or less than posterior outer toe and claw, which is generally shorter than the outer anterior one; tail short and stiff, the shafts of the quills usually yellow.

The genus is confined to the Ethiopian region; five out of some seventeen species are found in South Africa.

Key of the Species.

- A. Back spotted with yellowish white.
- a. Below with rounded black spots through-
out..... *C. notata*, p. 129.
- b. Below with longitudinal black streaks ... *C. abingdoni*, p. 130.
- c. Throat and chest black, spotted with
white; rest of the under surface
yellowish streaked with black *C. smithi*, p. 131.

- B. Back transversely barred with yellowish-white; below, throat and ear-coverts unspotted, chest with rounded spots.
- a. Rump transversely barred; lower parts conspicuously spotted *C. bennetti*, p. 133.
- b. Rump not barred, slightly spotted; lower parts almost immaculate *C. b. capricornis*, p. 134.

436. **Campothera notata.** *Knysna Woodpecker.*

Le Pic tigré, *Levaill. Ois. d'Afr.* vi., p. 19, pl. 250 (1808).

Picus notatus, *Licht. Verz. Doubl.* p. 11 (1820).

Campothera nubica (*nec Gmel.*), *Layard's B. S. Afr.* p. 238 (1867).

Campothera notata, *Sharpe, ed. Layard's B. S. Afr.* p. 186 (1875); *Hargitt, Ibis*, 1883, p. 461; *id. Cat. B. M.* xviii, p. 95 (1890); *Shelley, B. Afr.* i, p. 131; *Woodward Bros. Natal B.* p. 103 (1899).

Description. *Adult male.*—Forehead and crown dark brown, the feathers tipped with crimson, occiput pure crimson; back, scapulars and wings olive-green, slightly spotted with dull white, some of the rump feathers tipped with the same colour; wing- and tail-quills dusky, edged with olive and sparingly spotted and barred with dull white; tail tip washed with golden-yellow, below, including the sides of the head and neck and under wing-coverts, pale yellow throughout, thickly spotted with black, the spots which are largest on the breast being semi-circular; a malar streak of crimson on either side from the base of the lower mandible.

Iris brown; bill, legs and feet black.

Length in flesh 8·5; wing 4·1; tail 2·8; tarsus 0·75; culmen 0·85.

The female differs from the male in having the forehead and crown black with pale yellow spots at the tips of the feathers; the malar stripe has no crimson but is black with a few yellow spots, it is also slightly smaller. Wing 3·90.

Distribution.—The Knysna Woodpecker was first discovered by Levillant in the Outeniqua forests of George and Knysna; eastwards of this it extends as far as Natal and northwards to Colesberg.

The following are localities: Cape Colony—George, Knysna (S. A. Mus.), Grahamstown (Layard), Eland's Post, *i.e.*, Stockenstroom (Atmore), Colesberg (Arnot), Peddie, Transkei and Port St. Johns (S. A. Mus.); Natal—Ifafa and Illovo (Woodward).

Habits.—But little is known about the habits of this bird, Le-

vallant states that they lay four eggs of a bluish-white colour spotted with brown, and that both male and female assist in incubation. The stomach of a specimen now in the South African Museum contained ants.

437. **Campothera abingdoni.** *Golden-tailed Woodpecker.*

Chrysoptilus abingdoni, *Smith, Report Exp. Centr. Afr.* p. 53 (1836) [Port Natal].

Dendromus chrysurus, *Swains. B. W. Afr.* ii, p. 158 (1837).

Campethera chrysurus, *Gurney, Ibis*, 1860, p. 213 [Natal]; *Layard, B. S. Afr.* p. 238 (1867).

Dendromus smithi (*nec Malh.*), *Gurney, Ibis*, 1862, pp. 37, 157 [Natal].

Chrysopicus chrysurus, *Malh. Picidæ* ii, p. 153, pl. 94, figs. 4, 5 (1862).

Dendrobates striatus, *Layard, Ibis*, 1871, p. 227 [Kanye].

Campethera abingtoni, *Sharpe, ed. Layard's B. S. Afr.* p. 182 (1875); *Hargitt, Ibis*, 1883, p. 471; *W. Ayres, Ibis*, 1887, p. 53 [Umzeilla's Country]; *Hargitt, Cat. B. M.* xviii, p. 98 (1890); *Shelley, B. Afr.* i, p. 131 (1896); *Woodward Bros. Natal B.* p. 104 (1899); *id. Ibis*, 1900, p. 521 [St. Lucia Bay].

Description. *Adult male*—Forehead and crown slaty-black, the feathers tipped with crimson, the occiput crimson; back and wings olive-green becoming more golden-olive on the rump and upper tail-coverts, the back and wings with diamond-shaped spots, the rump with a barring of yellowish-white; wing-quills dusky edged with olive and spotted and barred with yellowish-white; tail golden-olive barred with paler, the shafts and tips rich golden-yellow; below, including the ear-coverts and sides of the neck, dull white streaked with black; malar stripe from the base of the mandible crimson; under wing-coverts pale yellow spotted with black.

Iris dark crimson to light reddish-brown; bill dark brown; legs and feet dull green.

Length about 8.60; wing 4.25; tail 2.40; tarsus 0.95; culmen 1.05.

The female has the forehead and crown black with dull white spots at the tips of the feathers, while the occiput remains crimson; the malar stripe is black and pale white intermixed, and the iris is brown and not crimson.

Distribution.—The type of this species was obtained in 1832 by Sir A. Smith, near Port Natal or Durban as it is now called. It is found throughout the greater part of Natal, Zululand and the Eastern Transvaal, extending northwards to Nyasaland; it has also

been noticed in Bechuanaland by Exton, whose specimens were named *D. striatus* by Layard.

The following are recorded localities: Natal—Durban and Pine-town (Brit. Mus.), Maritzburg (Woodward), Echowe (Woodward in S. A. Mus.), St. Lucia Lake (Woodward); Transvaal—Swaziland (Brit. Mus.), Komatipoort (Francis in S. A. Mus.), Rooi Rand in Zoutspansberg (W. Ayres); Bechuanaland—Kanye (Exton in S. A. Mus.).

Habits.—Mr. Ayres writes as follows regarding the Golden-tailed Woodpecker: "These Woodpeckers are to be found throughout the Colony (of Natal), wherever there is bush-land, singly or in pairs; their note is loud and harsh; they are very restless in their habits, constantly hunting for food as if they never obtained a sufficiency; ants and other insects appear to be their usual food, which they search for and catch on the rough bark of trees; they also hammer away at dead boughs from which they extract soft grubs; their flight is heavy and dipping and they are found all the year round.

"For the purpose of incubation a hole is made in the trunk of a decayed tree, just large enough at the entrance for the bird to enter, but becoming wider inside and reaching downwards to a depth of a foot or eighteen inches; the eggs are laid on the bare wood and there is no nest."

A clutch of three eggs taken by Mr. A. D. Millar, at Gillits, near Durban, on October 22 and presented by him to the South African Museum, are shiny white ovals, measuring 0.92 × 0.70.

438. *Campothera smithi*. *Smith's Woodpecker*.

Picus smithii, *Malh. Rev. Zool.* 1845, p. 403.

Chrysopicus brucei, *Malh. Pictæ*, ii, p. 170, pl. 93, fig. 1 (1862).

Ipagrus brucei, *Gurney in Andersson's B. Damaraland*, p. 221 (1872).

Campothera smithii, *Sharpe, ed. Layard's B. S. Afr.* pp. 184, 812 (1875); *Oates, Matabeleland*, p. 306 (1881); *Shelley, Ibis*, 1882, p. 249 [Umfuli river]; *Hargitt, Ibis*, 1883, p. 467; *id. Cat. B. M.* xviii, p. 100 (1890); *Shelley, B. Afr.* i, p. 131 (1896); *Alexander, Ibis*, 1900, p. 427 [Zumbo].

Description. *Adult male.*—Closely allied to *C. abingdoni*; the pale spots, however, of the back are somewhat transversely elongated so as almost to form a series of bars; below, the throat, breast, and cheeks are black with small white spots, while the ear-coverts

are almost pure silvery; on the lower breast the black is somewhat irregularly distributed on a very pale yellowish-green ground; the abdomen and lower tail-coverts are also pale yellowish-green with rounded spots of black; the malar stripe, which is well marked, and the occiput are crimson.

Iris from pale magenta to dark brown; bill black; legs and feet greenish-grey.

Length about 9.0; wing 4.70; tail 2.80; culmen 1.1; tarsus 0.80.

The female has the forehead and crown black spotted with whitish, while the occiput remains crimson; the malar stripe is not marked, being black spotted with white like the throat.

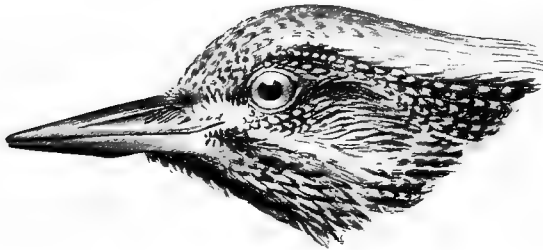


FIG 43.—*Campothera smithi*. $\times \frac{1}{3}$

Distribution.—The southern limit of this Woodpecker is the Orange River valley, whence it extends northwards to Damaraland and the Cunene river, and to Mashonaland; north of our limits it has been obtained in Angola and Nyasaland. The Woodpeckers obtained by Exton at Kanye in Bechuanaland and described by Layard as *Dendrobates striatus*, judging from a pair preserved in the South African Museum, appear to be referable to *C. abingdoni* rather than to this species.

The following are localities: Cape Colony—Upington on the Orange river, February, May, July (Bradshaw in S. A. Mus.); Transvaal—Rustenburg (Ayres in Bt. Mus.); Rhodesia—Tati river, October (Oates), Umfuli river, August (Ayres); German south-west Africa—Otjimbingue (Andersson), and Omaruru (Eriksson in S. A. Mus.) in Damaraland, Ondonga, Ovaquenyana, and Elephant Vley in Ovampoland (Andersson in Bt. Mus.); Portuguese east Africa—Zumbo on the Zambesi (Alexander).

439. *Campothera bennetti*. *Bennett's Woodpecker*.

Chrysoptilus bennetti, *Smith, Rep. Exped. Centr. Afr.* p. 53 (1836); *Gurney, Ibis*, 1869, p. 296 [Limpopo river].

Campothera variolosa, *Gray, Gen. B.* ii, p. 439 (1846).

Chrysopicus variolosus, *Malh. Monogr. Picid.* ii, p. 165, pl. 95, figs. 1, 2 (1862).

Campothera bennetti, *Layard, Ibis*, 1871, p. 227 [Kanye]; *Sharpe, ed. Layard's B. Afr.* p. 181 (1875); *Ayres, Ibis*, 1879, p. 299 [Rustenburg]; *Oates, Matabeleland*, p. 306 (1881); *Hargitt, Ibis*, 1883, p. 456; *Ayres, Ibis*, 1886, p. 291; *W. Ayres, Ibis*, 1887, p. 53 [Lehtaba river]; *Hargitt, Cat. B. M.* xviii, p. 102 (1890); *Shelley, B. Afr.* i, p. 131 (1896); *Sharpe, Ibis*, 1897, p. 501 [Zululand]; *Woodward Bros. Natal B.* p. 104 (1899); *Marshall, Ibis*, 1900, p. 250 [Mashonaland].

Ipagrus variolosus, *Gurney, Andersson's B. Damaraland*, p. 222 (1872).

Description. Adult male.—Crown and occiput crimson, the former usually showing the slaty bases of the feathers; back and wings very dark olive, with narrow transverse bands of white; wing-quills dusky, washed with olive, with bright yellow shafts and spotted on the outer web with pale olive, the inner one with white; tail-quills golden-olive with yellow shafts, the central pair unbarred, the lateral ones obscurely barred with dusky; feathers round the eye, ear-coverts and throat pure white; a well-developed crimson malar stripe; rest of the lower surface and sides of the neck pale yellow, spotted on the breast and flanks with rounded black spots.

Iris dark wine colour; bill blackish-slate; legs and feet slate.

Length about 7·25; wing 4·55; tail 2·50; culmen 1·0; tarsus 0·80.

The female has the forehead and crown black spotted with white; the lores, ear-coverts, chin and throat chesnut-brown, the malar region and remaining portions of the face white.

Distribution.—Bennett's Woodpecker was first discovered by Sir A. Smith during his memorable journey to the interior in 1836 in the neighbourhood of Kurrichane, in what is now the Rustenburg district of the Transvaal. From here it is spread over the greater part of Bechuanaland, Rhodesia, and the bush country of the Transvaal, as far as Swaziland and Zululand. Beyond our limits it has been found in Nyasaland and the interior of German east Africa.

The following are localities: Zululand—Black Umfolosi river (Woodward); Transvaal—Swaziland (Bt. Mus.), Zand and Sabi rivers in Lydenburg (Francis in S. A. Mus.), Lehtaba river in

Zoutspansberg (W. Ayres), Rustenburg (Ayres); Bechuanaland—Kanye (Exton), Lake Ngami region (Andersson); Rhodesia—Second Makalaka Kraal, west of Bulawayo (Oates), Salisbury district (Marshall).

Habits.—No observations to speak of have been made on this bird's habits. Mr. W. Ayres states that it is common in Mopani bush, and Mr. Marshall found small coleopterous insects and black ants in the stomach of one examined by him.

439a. ***Campothera bennetti capricornis*.**

Capricorn Woodpecker.

Campothera capricornis, *Strickland, Contr. Orn.* 1852, p. 155; *Newton, Ibis*, 1869, p. 323, pl. 9; *Sharpe, ed. Layard's B. S. Afr.* p. 180 (1875); *Hargitt, Cat. B. M.* xviii, p. 104 (1890); *Shelley, B. Afr.* i, p. 131 (1896).

Ipagrus capricorni, *Gurney in Andersson's B. Damaraland*, p. 221 (1872).

Description. *Adult.*—This sub-species differs from the preceding in having the rump and upper tail-coverts unbarred yellowish-white with a few spots; the lower surface of the body is much less profusely spotted.

The female is like that of *C. bennetti typica*, but the throat and ear-coverts are black not chestnut-brown; there are hardly any spots on the lower surface of the body, and the rump and upper tail-coverts are not barred. Specimens in the South African Museum from North Damaraland and Ovampoland are somewhat intermediate in coloration between the two sub-species; out of four only one has the rump clearly spotted.

Distribution.—The Capricorn Woodpecker replaces Bennett's Woodpecker in the northern half of German south-west Africa, extending northwards across the Cunene into Angola. Mr. Andersson believes it to be a migratory bird, as he never saw it during the dry season.

The following are the recorded localities: Omanbondi in North Damaraland (Andersson), Elephant Vley (Andersson in S. A. Museum), Ochimbora and Omlola (Eriksson in S. A. Museum), all in Ovampoland.

Genus III. **DENDROPICUS.***Type.***Dendropicus**, *Malh. Rev. Zool.* 1849, p. 532*D. cardinalis*.

Bill short, not so long as the head; a well-marked nasal shelf on either side of the culmen, the width of which at the base is greater than the distance between its outer edge and the cutting edge of the mandible; nostrils concealed by plumes, the chin angle at the base of the lower mandible not extending further forward than the nasal plumes; wings moderately pointed, the difference between the primaries and secondaries exceeding the length of the culmen; tarsus about the same length as the outer posterior toe with claw, which is longer than the outer anterior toe; plumage barred and spotted.

Thirteen species of this genus have been described, all from the Ethiopian region; only one of these, the type species of the genus, occurs in South Africa.

440. **Dendropicus cardinalis.** *Cardinal Woodpecker.*

- Picus cardinalis*, *Gmel. Syst. Nat.* i., p. 438 (1788).
 Le Petit Pic à baguettes d'or, *Levaill. Ois. d'Afr.* vi., p. 25, pl. 253 (1808).
Picus fulviscapus, *Licht. Verz. Doubl.* p. 11 (1823); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 44 (1858).
Dendropicus hartlaubi, *Malh. Rev. Zool.* 1849, p. 532; *Gurney in Andersson's B. Damaraland*, p. 219 (1872); *Buckley, Ibis*, 1874, p. 368; *Sharpe, ed. Layard's B. S. Afr.* pp. 189, 812 (1875-84); *Gurney, Ibis*, 1877, p. 342.
Dendropicus cardinalis, *Gurney in Andersson's B. Damaraland*, p. 220 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 190, 812 (1875-84); *Barratt, Ibis*, 1876, p. 200 [Rhenoster river]; *Oates, Matabeleland*, p. 306 (1881); *Hargitt, Ibis*, 1883, p. 437; *Symonds, Ibis*, 1887, p. 330 [Kroonstad]; *Hargitt, Cat. B. M.* xviii, p. 295 (1890); *Distant, Nat. Transvaal*, p. 166 (1892) [Pretoria]; *Shelley, B. Afr.* i, p. 132 (1896); *Rendall, Ibis*, 1896, p. 169 [Barberton]; *Marshall, ibid.* p. 242 [Salisbury dist.]; *Sharpe, Ibis*, 1897, p. 501 [Echowe]; *Sowerby, Ibis*, 1898, p. 572 [Ft. Chiquaqua]; *Woodward Bros. Natal B.* p. 105 (1899); *Alexander, Ibis*, 1900, p. 427.
Dendrobates cardinalis, *Buckley, Ibis*, 1874, p. 368.
Dendropicus fulviscapus, *Ayres, Ibis*, 1879, p. 298 [Rustenburg]; *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 163 (1882); *Butler, Feilden, and Reid, Zool.* 1882, p. 208.

Description. *Adult male.*—Forehead and front portion of the crown umber-brown, hinder portion, occiput, and nape crimson; back dark olive-brown, regularly barred with white, rump and upper tail-coverts washed with yellowish; wing and tail-quills dusky, barred like the back, the shafts bright yellow; the two central tail-feathers washed with golden-yellow; below, including the sides of the neck, dusky-white streaked on the breast and barred on the flanks with black; ear-coverts silvery; malar streak umber-brown; under wing-coverts barred with brown.

Iris dark claret to dark brown; legs and feet ashy-olive.

Length in flesh 6·0, in skin 6·25; wing 3·6; tail 1·80; culmen 0·80; tarsus 0·62.

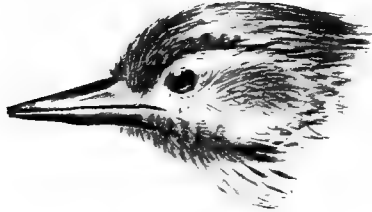


FIG. 44.—*Dendropicus cardinalis*. $\times \frac{1}{3}$

The female differs from the male in having the hinder part of the crown and occiput black; the sides of the neck and cheeks also are less spotted with black; the size is about the same.

Distribution.—The Cardinal Woodpecker is the most widely spread and the commonest of the South African members of this family. It is found everywhere from Cape Town to the Cunene and from Durban to the Zambesi, and extends northwards through Angola to the Quanza river, and through Nyasaland and Portuguese east Africa to the Rovuma river, beyond which its place is taken by the closely allied *Dendropicus zanzibari*.

Birds from the Zambesi valley are slightly paler, and those from Damaraland are less yellow and somewhat greyer, but hardly sufficiently distinct to recognise them even as sub-species.

The following are localities: Cape Colony—Cape div. (Layard), Swellendam (Levaill.), Oudtshoorn (Victorin), Knysna (Layard), Tulbagh (S. A. Mus.), Beaufort West (Layard), Upington (S. A. Mus.), Barkly West (S. A. Mus.), Colesberg (Layard), Stockenstroom (Atmore), King Williams Town (Bt. Mus.), Port St. Johns (S. A.

Mus.); Natal—Durban, Weenan, and Newcastle (Bt. Mus.), Echowé (Woodward); Orange River Colony—Kroonstad (Symonds), Rhenoster river (Barratt); Transvaal—Swaziland (Buckley), Barberton (Rendall), Lydenburg dist. (Francis in S. A. Mus.), Pretoria (Distant), Rustenburg (Ayres); Bechuanaland—Kanye (Exton), Bamangwato (Buckley); Rhodesia—Tati and Ramequeban rivers (Oates), Salisbury dist. (Marshall); German south-west Africa—Gt. Namaqualand, Swakop river, Otjimbingue, Elephant Vley (Andersson); Portuguese east Africa—Zambesi valley (Alexander).

Habits.—The Cardinal Woodpecker is a somewhat tame little bird found singly or in pairs all over the country; it affects trees of a moderate size, especially the mimosas, which grow along the river beds, it also frequently perches on the dead stumps of the euphorbias and aloes; it spends its time like other Woodpeckers tapping the branches and searching the trunks of trees for its food, which consists wholly of insects, chiefly small *Coleoptera*. Little has been noticed about its breeding habits, but Layard states that a pair nested annually in an old apple tree on Mr. Melck's farm at the Berg river, and that the tree was riddled with their holes. Levaillant states that they lay five to seven pure white eggs, and that both cock and hen share in the labour of incubation.

Genus IV. **THRIPIAS.**

Type.

Thripias, *Cab. & Heine, Mus. Hein.* iv, p. 121 (1863)...*T. namaquus*.

Bill stout and strong, longer than the head; a well-marked nasal shelf on either side of the culmen, the width of which at the base is far greater than the distance between the outer edge and the cutting edge of the mandible; nostrils concealed by plumes; the chin angle at the base of the lower mandible reaches a good deal further forwards than the nasal plumes; wings moderately pointed, but the difference between the primaries and secondaries is only equal to about three-quarters the length of the culmen; tarsus hardly equal to the posterior outer toe with claw, which again is distinctly longer than its anterior fellow; plumage barred and spotted. Only two closely allied species of this genus confined to eastern and southern Africa have been described.

441. **Thripias namaquus.** *Bearded Woodpecker.*

Picus namaquus, *Licht. Cat. rer. Nat. Hamb.* p. 17 (1793).

Le Pic à double moustache, *Levaill. Ois. d'Afr.* vi, p. 22, pls. 251, 252 (1808).

Dendrobates namaquus, *Layard, B. S. Afr.* p. 236 (1867); *id. Ibi* 1871, p. 227 [Kanye]; *Ayres, ibid.* p. 261; *Buckley, Ibis*, 1874, p. 368 [Transvaal].

Dendropicus namaquus, *Sharpe, ed. Layard's B. S. Afr.* pp. 188, 812 (1875-84); *Ayres, Ibis*, 1879, p. 300 [Magaliesberg]; *Oates, Matabeleland*, p. 306 (1881); *Shelley, Ibis*, 1882, p. 249 [Umfuli river].

Mesopicus namaquus, *Hargitt, Ibis*, 1883, p. 407; *W. Ayres, Ibis*, 1887, p. 53 [Zoutspansberg].

Thripias namaquus, *Gurney in Andersson's B. Damaraland*, p. 219 (1872); *Hargitt, Cat. B. M.* xviii, p. 306 (1890); *Shelley, B. Afr.* i, p. 133 (1896); *Sharpe, Ibis*, 1897, p. 501 [Zululand]; *Woodward Bros. Natal B.* p. 105 (1899); *Marshall, Ibis*, 1900, p. 250 [Mashonaland]; *Alexander, ibid.* p. 427 [Zambesi].

"*Isigopamuti*" (*i.e.*, pecker of wood) of the Zulus (Francis); probably applied to other woodpeckers as well.

Description. Adult male.—Forehead and front part of the crown olive spotted with white, hinder portion of crown crimson, nape black; back and wings olive-green, banded somewhat irregularly with yellowish-white with a golden wash on the tail-coverts; wing-quills dusky-olive spotted on both webs; tail dusky, with indistinct cross bands of dull white and golden-yellow shafts; cheeks and throat white; ear-coverts and a broad band separating the cheeks and throat, black; breast, under wing-coverts and rest of lower surface dusky-green barred with whitish; tail-quills golden-yellow below.

Iris dark wine colour (sometimes hazel); bill greenish-grey; legs and feet greyish-olive.

Length about 8·75; wing 5·0; tail 2·5; culmen 1·35; tarsus 0·85.

In the female the fore part of the crown is black, spotted with white, the hinder part and occiput black; there is no appreciable difference in size. A female obtained by Alexander in the Zambesi valley had some of the feathers of the crown tipped with scarlet; it was, perhaps, a very old bird.

Distribution.—The Bearded Woodpecker is stated by Lichtenstein to have come from Namaqualand, whence its name, but it has not been found south of the Orange river in modern times. Levaillant, on the other hand, states that he obtained it in Caffraria.

Its most southerly limit is in Pondoland, whence it extends through the greater part of the Transvaal, Bechuanaland, Rhodesia, and German south-west Africa, from Great Namaqualand (where it is very rare) to Angola; north of the Zambesi this bird is found in Nyasaland and German east Africa to about the latitude of Zanzibar.

The following are South African localities: Cape Colony—Near Port St. Johns (S. A. Mus.); Zululand—Hlabisa, Echowe (Woodward); Transvaal—Swaziland (Buckley), Komatipoort (Francis in S. A. Mus.), Zoutspansberg (W. Ayres), Rustenburg (Ayres); Bechuanaland—Kanye (Exton), Macloutsi river (Oates), Lake Ngami (Andersson); Rhodesia—Ramequeban river (Oates), Umfuli and Quaequae rivers in Mashonaland (Ayres); German south-west Africa—Great Namaqualand, scarce (Andersson), Omaruru in Damaraland (Eriksson), Ondonga in Ovampoland (Andersson); Portuguese east Africa—Tete and Zambesi valley, common (Kirk and Alexander).

Habits.—The Bearded Woodpecker seems nowhere plentiful except in the Zambesi valley; it is partial to mimosa bush, where it may be seen flying swiftly from tree to tree, uttering a loud harsh scream; in such localities its loud tapping can be often heard; this seems to form a kind of call-note, as it is generally answered at a distance by the bird's mate, each call consisting of four regular taps. Like other Woodpeckers its food consists of insects and grubs found on and under the bark of trees. No one has observed the nesting habits of this bird since the time of Levaillant; he states that the eggs are four in number and white, and that both male and female share in the duties of incubation.

Genus V. **MESOPICUS.**

Type.

Mesopicus, *Mall. Mem. Acad. Metz*, 1848-9, p. 340.....*M. goertan*.

Bill moderate, about as long as the head, the nasal shelf well marked and broad, its bounding ridge joining the cutting edge of the mandible about two-thirds of the way down; chin angle well in advance of the nostrils, which are concealed by plumes; wing moderately pointed, the difference between the primaries and secondaries about two-thirds the length of the culmen; tarsus only slightly longer than the outer posterior toe without claw, which

itself is longer than the outer anterior one. Plumage never barred or spotted above.

This genus contains eight species, only one of which is found within our limits; all are confined to the Ethiopian region.

442. **Mesopicus griseocephalus.** *Olive Woodpecker.*

Picus griseocephalus, *Bodd. Tabl. Pl. En.* p. 49 (1783).

Picus menstruus, *Scop. Del. Fl. et Faun. Insubr.* ii, p. 39 (1786).

Picus capensis, *Gmel. Syst. Nat.* i, p. 430 (1788); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 44 (1858) [Knysna].

Le Pic olive, *Levaill. Ois. d'Afr.* vi, p. 16, pls. 248, 249 (1808).

Dendrobates griseocephalus, *Gurney, Ibis*, 1864, p. 353 [Natal]; *Layard, B. S. Afr.* p. 236 (1867).

Dendropicus menstruus, *Sharpe, ed. Layard's B. S. Afr.* pp. 191, 812 (1875-84); *Barratt, Ibis*, 1876, p. 200 [Transvaal]; *Butler, Feilden, and Reid, Zool.* 1882, p. 208 [Newcastle].

Mesopicus menstruus, *Ayres, Ibis*, 1876, p. 432 [Lydenburg].

Mesopicus griseocephalus. *Hargitt, Ibis*, 1883, p. 417; *id. Cat. B. M.* xviii, p. 371 (1890); *Shelley, B. Afr.* i, p. 133 (1896); *Sharpe, Ibis*, 1897, p. 501 [Echowe]; *Woodward Bros. Natal B.* p. 105 (1899).



FIG. 45.—*Mesopicus griseocephalus.* $\times \frac{2}{10}$.

Description. Adult male.—Forehead, above the eyes, ear-coverts, cheeks and throat slaty; crown of the head, rump and upper tail-coverts crimson; back and scapulars golden-olive; wing-quills dusky, washed externally with olive and with white spots on the inner webs only; tail-feathers dusky-black; below, dull olive-grey washed with golden-olive with a tinge of crimson on the breast and with a patch of crimson wash on the middle of the abdomen; under wing-coverts banded black and white; tongue long, horny, and barbed at the tip.

Iris dark brown ; bill bluish-black ; legs and feet greenish-ash.

Length about 8·5 ; wing 4·30 ; tail 2·75 ; culmen 1·15 ; tarsus 0·75.

The female differs from the male in having an entirely slaty-grey head without any crimson ; the crimson wash on the abdomen is hardly noticeable. It is also slightly smaller (*i.e.*, wing 4·0 ; culmen 0·85).

Distribution.—The Olive Woodpecker is spread over the southern and eastern parts of South Africa from the neighbourhood of Cape Town to Natal, Zululand, and the Transvaal, but although it has been obtained in Nyasaland and Angola it has not yet been met with in Rhodesia, so far as I am aware.

The following are localities : Cape Colony—Cape and Stellenbosch div. (S. A. Mus.), George (Atmore), Knysna (Victorin), Stockenström (Atmore), King William's Town (Trevelyan in Bt. Mus.), Port St. John's (S. A. Mus.) ; Natal—Newcastle (Butler), Echowe (Woodward) ; Transvaal—Lydenburg (Ayres), Pretoria and Marico (Barratt).

Habits.—This Woodpecker does not differ from others of the same family in habits ; it is found only in thick wood singly or in pairs ; it feeds on insects and their larvæ, which it extracts from under the bark or from the wood of trees ; in this it is helped by its long and very extensile tongue, which is horny at the tip and provided with barbs for withdrawing the grubs from their hiding places. The eggs, which are laid in a hole in a tree probably excavated by the bird itself, are white and shiny and somewhat truncated at the obtuse end ; they measure about 0·85 × 0·67. According to Levaillant both sexes share in the incubation.

Subfamily II. IYNGINÆ.

Tail feathers twelve in number (outer pair very short), all soft and rounded, not stiff and spiny as in other Woodpeckers ; tail long, equal to the longest primary, more than three-quarters the length of the wing ; nostrils not concealed by plumes but almost closed up by membrane.

Only the single genus is contained in the subfamily.

Genus I. IYNX.

*Type.***Jynx**, *Linn. Fauna Suec.* no. 97 (1746)I. *torquilla*.**Yunx**, *Linn. Syst. Nat.* i, p. 172 (1766)I. *torquilla*.

Bill of moderate length, conical and compressed; plumage soft brownish-grey and speckled, somewhat resembling that of a Night-Jar.

Four species of Wrynecks have been described; of these the best known (*I. torquilla*) is found all over Europe and Asia, wintering in India and northern and central Africa; the other three are purely Ethiopian in their range.

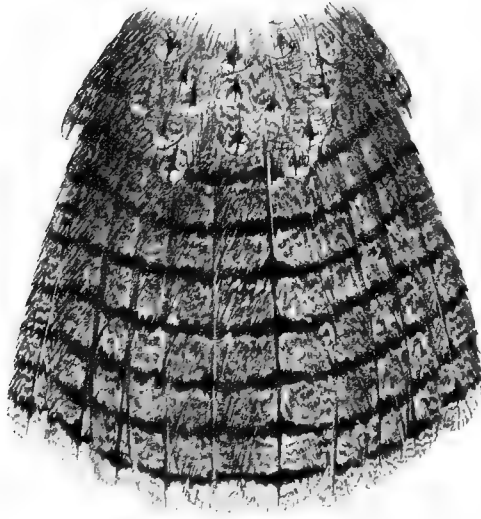


FIG. 46.—Tail of *Iynx ruficollis*. $\times \frac{2}{10}$.

443. **Iynx ruficollis.** *South African Wryneck.*

Iynx ruficollis, *Wagler, Nat. Syst. Amph.* p. 118 (1830).

Yunx pectoralis, *Vigors, P. Z. S.* 1831, p. 93; *Gurney, Ibis*, 1862, p. 33 [Natal]; *Layard, B. S. Afr.* p. 240 (1867); *Sharpe, ed. Layard's B. S. Afr.* pp. 191, 812 (1875-84).

Iynx pectoralis, *Ayres, Ibis*, 1879, p. 300 [Rustenburg]; *Oates, Matabeleland*, p. 306 (1881) [Upper Natal]; *Butler, Feilden, and Reid, Zool.*

1882, p. 208; *Hargitt, Cat. B. M.* xviii, p. 565 (1890); *Shelley, B. Afr.* i, p. 130 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 411, 502 [Zululand]; *Woodward Bros. Natal B.* p. 106 (1899).

Description. *Adult.*—General colour above, speckled-brown, an irregular black streak from the middle of the crown to the shoulders; wing-coverts and inner secondaries with a number of black paler edged spots; wing-quills dusky-black with pale brick spots and bars on both webs; tail-feathers (the shafts of which are not



FIG. 47.—*Iynx ruficollis*. $\times \frac{1}{2}$.

stiffened and pointed as in other woodpeckers) irregularly barred with black; ear-coverts and cheeks barred black and white; chin, throat and upper breast rich chestnut-brown, rest of the under surface dull white, the breast streaked, the abdomen barred with black; under tail-coverts slightly rufescent also with black markings; under wing-coverts pale rufous.

Iris reddish-brown; bill, legs and feet dull light green.

Length about 7·0; wing 3·40; tail 2·70; culmen 0·60; tarsus 0·65.

The sexes are alike in marking and size.

Distribution.—Most of the evidence hitherto advanced seems to point to the fact that this is a migratory bird spending the winter from May to October in South Africa, and the other part of the year in central Africa, though Mr. Millar is rather of opinion that it is found near Durban all the year round.

Within our limits it has been noticed in the eastern half of the Cape Colony, Natal, and the western Transvaal only, beyond at Nairobi (Jan.) and Lake Naivascha in British east Africa, at Lado on the Upper Nile, and at Landana on the Congo.

The following are South African localities: Cape Colony—Grahamstown (Layard), Stockenstroom, April to Jan. (Atmore), Butterworth in the Transkei (S. A. Mus.); Natal—Ifafa (Woodward),

Pinetown, June (Ayres in Bt. Mus.), Umlazi, Aug. (Bt. Mus.), Blaauwkrantz River, near Colenso, May (Oates), Colenso, Nov., and Ladysmith, Nov. (Butler), Echowe (Woodward); Transvaal—Rustenburg, July, scarce (Ayres).

Habits.—The Wrynecks differ considerably in appearance from other Woodpeckers, as the feathers composing their tails are not stiff but soft like that of other birds and they are not used to assist in climbing, but are often seen cocked up as the bird climbs a tree. The South African Wryneck seems to be nowhere very common; it is generally found in open park-like country, where it flies from tree to tree giving utterance to a harsh screaming cry sometimes reminding one of that of a hawk; its flight is heavy and dipping; its food consists exclusively of insects of various kinds, and is almost entirely obtained in the crevices of the trunks and branches of trees; unlike the true Woodpecker it never hammers or bores into the solid wood for food; ants and other insects are caught by the tongue, which is long, retractile, and provided with a glutinous secretion to which the insects stick; it may often be seen sitting on a bough for a long time uttering a monotonous call-note.

Dr. Stark found a nest of this bird at Pinetown, in Natal, on August 22; it was in a hole in a *Syringa* tree in a garden about ten feet above the ground; the birds had hatched out the young ones and the parent was watched bringing food to them; before entering the hole it clung for a short time to the tree trunk; before leaving it sat for a long time with its body half out of the hole watching, and when doing so was nearly invisible.

Family II. INDICATORIDÆ.

Bill short and stout; wing long and pointed with only nine primaries, the first nearly as long as the second; tail of twelve or ten feathers; feet zygodactyle, *i.e.*, first and fourth toes backwardly directed; second and third forwardly directed.

Palate ægithognathous; vomer bifid; oil gland tufted; cæca absent.

The Honey Guides are most of them found in Africa; two species occur in the Himalayas and one in the mountains of the Malay Peninsula and Borneo. So far as is known they are parasitic in their habits, like cuckoos.

Key of the Genera.

- A. Tail of twelve feathers ; bill deeper than broad ... *Indicator*, p. 145.
 B. Tail of ten feathers ; bill broader than deep *Prodotiscus*, p. 155.

Genus I. **INDICATOR.***Type.***Indicator**, *Stephens, Gen. Zool.* ix, p. 131 (1815)*I. sparrmani*.

Bill stout and finch-like, deeper than broad, with a well-marked culminal ridge which is somewhat arched ; nostrils lateral and exposed with a narrow superior membrane ; no nasal plumes or



FIG. 48.—Tail of *Indicator sparrmani*. $\times \frac{9}{16}$.

rectical bristles ; wing with nine primaries only ; tarsus short ; toes well developed, the first and fourth posteriorly directed, the second and third anteriorly, the outer anterior (the third) the longest ; tail square except for the outer pair of rectrices, which are shorter and narrower than the others ; tail feathers twelve in number.

The birds of this genus are remarkable for the habit of pointing

out the situation of bees' nests, from which they derive their name of Honey Guide. So far as is known, they are parasitic, like the cuckoos, in regard to their nesting habits, but our knowledge in this respect is still imperfect.

The genus is spread over the whole of the Ethiopian region, and re-occurs in the Himalayas, the Malayan Peninsula, and Borneo. Out of ten African species four occur within our limits.

Key of the Species.

- A. Back slaty-black, with a bright yellow patch on the shoulders.
- a. Chin and throat black *I. sparrmani* ♂, p. 146.
 - b. Chin and throat white *I. sparrmani* ♀, p. 146.
- B. Black washed with golden-olive.
- a. Chin and throat bright yellow *I. major*, p. 149.
 - b. Chin and throat white with black streaks ... *I. variegatus*, p. 151.
 - c. Chin and throat olive-gray, with darker malar stripe on either side *I. minor*, p. 152.

444. **Indicator sparrmani.** *Sparrman's Honey Guide.*

Cuculus indicator, *Sparrman, Phil. Trans.* lxxvii, p. 38 (1777); *id. Voyage to Cape*, 8vo ed. ii, pp. 196, 202 (1785).

Indicator sparrmani, *Steph. Gen. Zool.* ix, p. 138 (1815); *Buckley, Ibis*, 1874, p. 368 [Limpopo]; *Sharpe, ed. Layard's B. S. Afr.* pp. 166, 810 (1876-84); *Ayres, Ibis*, 1879, p. 296 [Rustenburg]; *Oates, Matabeleland*, p. 305 (1881); *Butler, Feilden, and Reid, Zool.* 1882, p. 208 [Newcastle]; *Woodward Bros., Natal B.* p. 107 (1899); *Alexander, Ibis*, 1900, p. 424; *Ivy, Ibis*, 1901, p. 20.

Indicator albirostris, *Temm. Pl. Col.* pl. 367 (1825); *Pelzeln, Novara Reise, Vögel*, p. 102 (1865) [Cape division]; *Layard, B. S. Afr.* p. 242 (1867).

Indicator indicator, *Shelley, Cat. B. M.* xix, p. 5 (1891); *id. B. Afr.* i, p. 124 (1896); *Sharpe, Ibis*, 1897, p. 500 [Zululand].

"Inhlara of Zulus" (Francis).

Further accounts of this bird's habits will be found in the following books of travel:—

Barrow, "Travels in the Interior of Southern Africa," 1st ed. i, p. 321 (1801).

Moodie, "Ten years in South Africa," i, p. 313 (1835).

Delagorgue, "Voyage dans l'Afrique Australe," i, p. 494 (1847).

Livingstone, "Missionary Travels," p. 537 (1857).

Sandeman, "Eight months in an Ox Waggon," p. 235 (1880); reprinted in "Ibis," 1880, p. 286.

Millais, "A breath from the Veldt," p. 185 (1895).

Description. *Adult male.*—General colour above, dark brown, the rump and upper tail-coverts streaked with white, a golden-yellow patch on the shoulder formed by the tipping of some of the least wing-coverts; outer coverts edged with whitish; wing-quills dark brown; central pair of tail-feathers brown, others with increasing amounts of white until the outer pair are merely white tipped with brown; ear-coverts silvery; throat and cheeks black, rest of the lower surface and under wing-coverts slaty-white, almost pure white on the abdomen and under tail-coverts; flanks streaked with dark brown shaft lines.



FIG. 49. *Indicator sparrmani*. $\times \frac{1}{4}$.

Iris yellowish-brown; bill whitish to pale pink; legs and feet lead colour.

Length about 7.25; wing 4.40; tail 3.30; culmen 0.50; tarsus 0.62.

The female is slightly smaller and has the throat and cheeks white instead of black; bill dusky brown.

A young male has but slight traces of the golden shoulder patches, but the crown and chest are slightly washed with yellow and the black throat is variegated with yellow and white.

Distribution.—Sparrman's Honey Guide, though widely spread all over Africa, from Senegambia and Abyssinia southwards to Cape Colony, seems to be nowhere plentiful within our limits.

The following are localities: Cape Colony—Cape division, Nov., Dec. (S. A. Mus.), Berg river, Nov. (S. A. Mus.), Swellendam (Sparrman, Atmore, and Layard), Knysna (S. A. Mus.), Elands Post in Stockenstroom, May (Atmore), King William's Town, May (Bt. Mus.), St. John's river in Pondoland (Woodward); Natal—

Newcastle, Oct. (Butler), Ulundi and Black Umfolosi in Zululand (Woodward); Transvaal—Sabi river in Lydenburg, Aug. (Francis in S. A. Mus.), Rustenburg dist. (Ayres and Oates); Rhodesia—Upper Zambesi valley (Alexander).

Habits.—The celebrated traveller Sparrman, after whom this bird was subsequently named, was the first to discover, describe, and give a relation of the habits of this remarkable bird; his account, though often quoted, is well worth repetition; it is as follows:—

“The Bee Cuckoo (*Cuculus indicator*) which I made mention of just above deserves a more particular notice. It has, however, nothing remarkable in it with regard to its size and colour, as on a cursory view it appears in these points not to differ from the common sparrow, excepting indeed that it is somewhat larger and rather of a lighter colour, with a little yellow spot on each shoulder, and the feathers to the tail dashed with white. . . .

“The morning and evening are probably its principal meal times; at least it is then that it shows the greatest inclination to come forth, and with the grating cry of ‘churr churr,’ to excite as it were, the attention of the Ratel as well as of the Hottentots and Colonists. Somebody then generally repairs to the place whence the sound proceeds, when the bird, all the time continually repeating its cry, flies on slowly by degrees towards the quarter where the swarm of bees have taken up their abode. The persons thus invited accordingly follow, taking care at the same time not to frighten their guide with any unusual noise, or by means of a large company, but rather, as I have seen done by the shrewdest of my Boshies-men to answer it now and then with a soft and very gentle whistle, by way of letting the bird know its call is attended to. I have observed, that when the bees’ nest was at a good distance, the bird for the most part made long stages or flights, waiting for its sporting companion between its flight and farther exciting him; but flew to shorter distances and repeated its cry more frequently, and with greater earnestness, in proportion as they approached nearer the bees’ nest. I likewise saw, with astonishment, what I had been previously assured of by others, viz., that when this bird has in consequence of its great impatience got too far ahead of its followers it has flown back to meet them and with redoubled cries has upbraided them for being so tardy. Finally, when it has come to the bees’ nest, whether this be built in the cleft of a rock, in a hollow tree, or in some cavity in the earth, it hovers over the spot for the space of a few seconds, a circumstance which I myself have

been eye witness to twice; after which it sits in silence, and for the most part concealed in some neighbouring tree or bush, in expectation of what may happen and with a view of coming in for its share of the booty. . . .

“Having in consequence of the bird’s directions, dug up the bees’ nest or otherwise come at it, and plundered it, they usually by way of acknowledgment leave it a considerable portion of the worst part, or that part of the comb in which young bees are hatching.”

Sparrman goes on to say that he procured two examples, both females, near the Great Fish river, in the neighbourhood of what is now Somerset east. There can be very little doubt that the story of the peculiar behaviour of the Honey Guide is perfectly correct, as it has been corroborated by the evidence of nearly all subsequent travellers, especially by those whose works are quoted above. Ayres found the stomachs of examples shot by him full of bees’ wax and comb. Butler shot one while pecking at the comb of a wasps’ nest.

It seems probable that the birds of this family resemble the true Cuckoos in being parasitic as regards their nesting habits. Mr. Ivy states that he observed an example of this bird leave the nest of a Swallow (*Hirundo albigularis*) on November 4, and that the nest was subsequently found to contain the two small white eggs of the swallow, and a third larger oval one presumably belonging to the Honey Guide.

The skin of this bird is exceedingly tough and strong, almost resembling stiff parchment; possibly the object of this is to defend it from the stings of the infuriated bees.

445. **Indicator major.** *Yellow-throated Honey Guide.*

Le Grand Indicateur, male, *Levaill. Ois. d’Afr.* v, p. 135, pl. 241, fig. 1 (1806).

Indicator major, *Stephens, Genl. Zool.* ix, p. 139, pl. 27, fig. 1 (1815); *Gurney, Ibis*, 1862, p. 33 [Natal]; *Layard, B. S. Afr.* p. 241 (1867); *id. Ibis*, 1869, p. 373; *Sharpe, ed. Layard’s B. S. Afr.* pp. 168, 810 (1876-84); *Garrod, P. Z. S.* 1878, p. 930 (anatomy); *Ayres, Ibis*, 1879, p. 297 [Rustenburg]; *Shelley, Cat. B. M.* xix, p. 6 (1891); *Rendall, Ibis*, 1896, p. 168 [Lydenburg]; *Sowerby, Ibis*, 1898, p. 572 [Salisbury district]; *Woodward Bros. Natal B.* p. 107 (1899); *Ivy, Ibis*, 1901, p. 21 [Uitenhage].

Indicator barianus, *Heugl. Syst. Uebers.* p. 48 (1856); *Alexander, Ibis*, 1900, p. 426 [Upper Zambesi].

“Ingede” of the Zulus, also applied to other species of Honey Guides.

Description. *Adult male.*—General colour above, olive-brown, the head more yellowish, the lower back browner, the rump and upper tail-coverts white, wing-coverts and quills dusky brown edged with olive; central pair of tail-feathers dusky brown, the others with white, which becomes more abundant till the outer pairs are all white with brown tips; ear-coverts and feathers in front of the eye black; throat and chest bright yellow, rest of the under parts, including the under wing-coverts and edge of the wing, creamy-white.

Iris brown; bare skin; round the eye bluish-white; bill, legs greenish-slate.

Length about 7·0; wing 4·05; tail 2·70; tarsus 0·70; culmen 0·45.

The female resembles the male in colour and size, but is slightly smaller; wing, 4·00.

Distribution.—Levaillant first found this bird along the south coast of the Colony, in what are now the Knysna and George districts. Though widely distributed throughout South Africa from the neighbourhood of Cape Town to the Zambesi it seems nowhere very common. North of this it is spread over Africa as far as Senegambia on the west and Bogosland on the east, though it does not appear to inhabit the true forest-region of the west coast. The following are localities: Cape Colony—Cape division (S. A. Mus.), Caledon, Swellendam and George (Layard), Uitenhage (Ivy), Grahamstown (Mrs. Barber); Natal—Ifafa and Umlatusi river (Woodward,) near Maritzburg (S. A. Mus.); Transvaal—Sabi flats in Lydenburg (Rendall), Rustenburg (Ayres); Rhodesia—Ft. Chiquaqua near Salisbury (Sowerby), Upper Zambesi valley above Zumbo (Alexander).

Habits.—The Yellow-throated Honey Guide is found singly or in pairs in bush, veld, or forest country, though nowhere very common; it can often be detected by its shrill and constant chattering, which somewhat resembles that of the English squirrel; when at rest it often clings upright to the trunk of a tree like a Woodpecker. It feeds on honey and the wax of the comb, and perhaps on the bees as well, and the same stories as are told of Sparrman's Honey Guide are also related of this bird by Ayres, Layard, Rendall, and other observers.

Mrs. Barber states that in the neighbourhood of Grahamstown the eggs are laid in the nests of the Black-collared Barbet (*Lybius torquatus*), and Mr. Ivy tells me that at Blue Krantz in the Uitenhage division of the Colony, in November, 1894, he observed one of these birds being chased by two Drongos, the nest of which was seen at the top of some high Euphorbia trees, and that he could distinctly see the transparent egg of the Honey Guide among the more opaque white eggs, three in number, of the Drongo.

446. *Indicator variegatus*. *Scaly-throated Honey Guide*.

Le Grand Indicateur, femelle, *Levaill. Ois. d'Afr.* v, p. 135, pl. 241, fig. 2 (1806); *Sundev. Krit. Framst. Orn. Levaill.* p. 50 (1857).

Indicator variegatus, *Lesson, Traité*, p. 155 (1831); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 43 (1858) [Knysna]; *Layard, B. S. Afr.* p. 242 (1867); *Sharpe, ed. Layard's B. S. Afr.* pp. 167, 810 (1876-84); *Shelley, Cat. B. M.* xix, p. 7 (1891); *id. B. Afr.* i, p. 125 (1896); *Sharpe, Ibis*, 1897, p. 500 [Zululand]; *Woodward Bros. Natal B.* p. 107 (1899); *Ivy, Ibis*, 1901, p. 21 [Uitenhage].

Indicator maculicollis, *Sundev. Ofvers. K. Vet. Akad. Forh.* 1850, p. 109.

Description. Adult.—The feathers of the forehead and anterior part of the crown with black centres and pale edges causing a mottled appearance, rest of the head and neck a dull green, becoming a bright olive on the back and wings; the upper tail-coverts dusky edged with bright olive; wing-quills and coverts dusky edged with olive; two pairs of the central tail-feathers black, the four outer pairs chiefly white with dusky tips; chin and throat white streaked with black, the breast ochreous-white slightly mottled with dusky, giving a scaly appearance, rest of under parts yellowish-white, the flanks and under tail-coverts streaked with brown; under wing-coverts white mottled with brown.

Iris light brown; bill black, lower mandible light at the base; legs and feet bluish-slate.

Length 7.25; wing 4.10; tail 2.90; tarsus 0.70; culmen 0.45.

Distribution.—This species was originally obtained by Levaillant on the south coast of the Colony, but was considered by him to be merely the female of the previous species, *Indicator major*; that this was not the case was first pointed out by Sundevall, who received a considerable series of examples of this bird from Wahlberg obtained in "Lower Kaffraria."

The distribution of this bird within our limits appears to be somewhat restricted, as it has only been hitherto recorded from the

southern part of the Colony and from Zululand, and has not yet been met with, so far as I am aware, in the Transvaal or Rhodesia.

Beyond our limits it is spread over Nyasaland and German east Africa, ranging as far north as Mombasa.

The following are South African localities: Cape Colony—George (H. Atmore), Knysna (Victorin, Layard and Marais), Beaufort West (T. C. Atmore), Uitenhage (Ivy); Natal—Echowe (Woodward).

Habits.—Little has been noticed about the habits of this Honey Guide; Layard found it flitting from bush to bush through the forest while the Woodwards often noticed it sitting motionless on the branch of a large fig-tree giving vent to a monotonous frog-like croak.

Mr. Ivy writes that once when encamped near the Zwartkop river in the Uitenhage division, one of these birds came up to the camp and on six different occasions led him up to bees' nests either in trees or rocks; he continues: "The Honey Bird would perch on some tree and commence calling 'cha, cha, cha,' to attract our attention, we then followed, all the while talking to the guide, as I was assured that if we did not keep up the conversation the bird would leave us, so we followed answering in such tones as pretty Jennie, good bird, we are here. When the bird came to the hive it would not go close to the bees, but would fly round at some distance leaving us to search for the nest, which we easily found by the passing bees. There were two adult and three young birds, but only one adult would lead us.

Mr. Marais of Knysna, found only bees'-wax and no insects in the stomachs of birds examined by him.

447. *Indicator minor.* *Lesser Honey Guide.*

- Le Petit Indicateur, *Levaill. Ois. d'Afr.* v, p. 137, pl. 242 (1806).
 Indicator minor, *Stephens, Genl. Zool.* ix, p. 140; *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 44 (1858) [Knysna]; *Gurney, Ibis*, 1859, p. 247; 1860, p. 205 [Natal]; *Kirk, Ibis*, 1864, p. 327; *Layard, B. S. Afr.* p. 243 (1867); *Gurney in Andersson's B. Damaraland*, p. 223 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 169, 811 (1876-84); *Shelley, Cat. B. M.* xix, p. 9 (1891); *id. B. Afr.* i, p. 125 (1896); *Sharpe, Ibis*, 1897, p. 500 [Zululand]; *Woodward Bros. Natal B.* p. 108 (1899); *Sharpe, Ibis*, 1900, p. 114 [Beira dist.], *Marshall, ibid.* p. 251 [Salisbury dist.]; *Ivy, Ibis*, 1901, p. 21 [Uitenhage dist.]
 "Honig-vogel" of Dutch Colonists, a name also applied to the other species.

Description. *Adult male.*—Head and neck greenish-ash, the back, wings and upper tail-coverts washed with golden-olive; wing-quills dusky washed with golden-olive on the outer edge, tail like that of the other species with the four central feathers black, the others with increasing amounts of white till the outermost pair are only tipped with black; below, greenish-grey becoming almost white on the abdomen and lower tail-coverts; ear-coverts silvery bordered below by a darker malar stripe.

Iris brown; bill black, pale brown at base of lower mandible; legs and feet bluish-black.

Length in flesh 6·6, in skin 6·25; wing 3·5; tail 2·30; tarsus 0·5; culmen 0·3.

The female resembles the male in plumage, but is slightly smaller, wing 3·3.

Distribution.—The little Honey Guide seems to be the commonest and most widely-spread of the South African species; though not recorded from near Cape Town, it has been met with in the north-western and southern districts of the Colony, throughout Natal, Mashonaland and German south-west Africa, but has not yet been noticed in the Transvaal so far as I am aware. North of the Zambesi this bird ranges through Nyasaland and German east Africa as far as Bogosland and Somaliland, while in West Africa it is replaced by a closely allied species.

The following are South African localities: Cape Colony—Namaqualand (Levaill.), George (Atmore), Oudtshoorn and Knysna (Victorin), Uitenhage (Ivy), Stockenstroom (Atmore), and King William's Town (Bt. Mus.), Port St. John's (S. A. Mus.); Natal—Ifafa (Woodward), Pinetown (Ayres in Bt. Mus.), Maritzburg (FitzSimmons), Echowe (Woodward); Transvaal—Swaziland (Buckley in Bt. Mus.); Rhodesia—Salisbury dist. (Marshall); German south-west Africa—Gt. Namaqualand, Otjimbingue in Damaraland (Andersson); Portuguese east Africa—Mapacuti in Beira dist. (Cavendish).

Habits.—This bird is found singly or in pairs, and like others of the genus feeds on bees and their wax and honey; though it has not got so good a reputation as the other species in the matter of leading people to bees' nests, according to Layard and Ivy; the Woodwards and Marshall speak of it as behaving in this respect like the other Honey Guides. The stomach is generally found to be full of a white substance supposed to be wax, but more probably this is the pollen always found adhering to the hind legs of bees, which it catches on the wing like a fly-catcher; it is often found watching

at a bee-hive for this purpose. Ayres also found caterpillars in the stomach of one example examined by him. Layard was informed by Mr. Atmore that it killed and devoured other small birds such as sparrows; this probably is an exaggeration, but the Woodward's confirm it to a certain extent, stating that it is pugnacious and that they have often observed it hunting small birds.

Like the others of this genus this Honey Guide has a chattering cry, constantly used to attract the honey-loving native towards the bees' nest.

There can be little doubt about its parasitic habits; Layard was informed by Atmore that the eggs were laid in the nests of the Olive Woodpecker (*Mesopicus griseocephalus*), or the Pied Barbet (*Tricholama leucomelan*), while Mrs. Barber states that the little Tinker bird (*Barbatula pusilla*) acts as an involuntary host. Mr. Ivy writes, that on one occasion in October, in a gorge near Blue Krantz in the Uitenhage district, he saw a Honey Guide fly to a hole in the trunk of a tree and endeavour to enter. It was, however, opposed in this by a male Barbet (*Lybius torquatus*), which was shortly afterwards joined by a female; the Honey Guide was soon hustled out and flew off across the gully followed by the female Barbet chattering and fighting all the while. In about five minutes the Honey Guide re-appeared, and the same scene took place and this continued for about an hour. All three birds were then shot. The Honey Guide was found to have an egg actually protruding from the vent; it was covered with skin, doubtless the evaginated lower portion of the oviduct. The egg itself was unbroken, it was very transparent and the yolk showed through. In the nest itself were two of the usual white eggs of the Barbet quite fresh.

Mr. A. Millar has also had much the same experience with this bird. He writes: "On December 17, 1899, when nesting near Durban I noticed two Barbets (*Lybius torquatus*) flying backwards and forwards carrying something in their mouths, and on approaching the tree saw the hole which the Barbets entered. I carefully watched them going in and out with food, and opening the hole was much surprised to find a young *Indicator minor* alone in the nest nearly full fledged, which no doubt had been reared by the Barbets. On the same day I came across the nest of another Barbet of the same species with the usual four eggs, and in addition a white glistening spherical egg measuring 0.85×0.78 , which was evidently foreign to the clutch and had been almost certainly laid by the Honey Guide.

Genus II. **PRODOTISCUS.***Type.***Prodotiscus**, *Sundev. Ofvers. K. Vet. Akad. Forhandl.*1850, p. 109 (1851) *P. regulus.*

Bill slender and very pointed but broader than deep; tail composed of ten feathers only. In other respects resembling *Indicator*.

This genus is entirely African, one out of three species recognised is found south of the Zambesi.



FIG. 50.—Tail of *Prodotiscus regulus*. $\times \frac{1}{2}$.

448. **Prodotiscus regulus.** *Wahlberg's Honey Guide.*

Prodotiscus regulus, *Sundev. Ofvers. K. Vet. Akad. Forhandl.* 1850, p. 109; *Sharpe, Rowley's Orn. Misc.* i, p. 208, pl. lower figure (1876); *id. ed. Layard's B. S. Afr.* pp. 171, 811 (1876-84); *Shelley, Cat. B. M.* xix, p. 11 (1891); *id. B. Afr.* i, p. 125 (1896); *Woodward Bros. Natal B.* p. 108 (1899).

Description. *Adult female.*—General colour above, uniform brown; tail blackish-brown with a large basal portion of the three outer feathers on each side white; underparts white, strongly washed with pale brown on the throat and flanks; under wing-coverts white, slightly washed with brown; under surface of the quills with white inner margins. Bill and feet blackish.

Length 4·8; wing 3·0; tail 2·25; culmen 0·45; tarsus 0·45.

Sundevall states that the throat is white in the male.

Distribution.—This is apparently a very rare bird; it was first

obtained by Wahlberg the Swedish naturalist in "upper and lower Caffraria" (*i.e.*, Natal and the Transvaal) more than fifty years ago. Since that date it has been only twice recorded, once from Caconda in Angola by Anchieta and once from Ifafa on the Natal coast by the Woodwards. I have recently examined an example in the Durban Museum obtained in the neighbourhood of that city. Nothing is known of its habits. Mr. Millar, to whom I applied for further information, states that it is uncommon in the neighbourhood of Durban, although procurable. It is not specially a bee-eater but feeds on insects generally, and will often remain on one tree for a considerable time seeking for its food. He further states that in October, 1900, he noticed one of these birds prying into and entering holes in trees as if about to nest, but that he was unable to find the nest.

Family III. CAPITONIDÆ.

Bill as a rule stout and strong; nostrils at the base of the bill often overhung by plumes and bristles which, together with the rictal bristles and those at the chin angle, are usually well-developed; ventral feather tract forked on the throat and on each side of the breast; ten tail-feathers; wing short and rounded, with ten primaries, the first of which is short; feet zygodactyle (see fig. 38, p. 122). Palate ægithognathous or desmognathous; vomer bifid; oil gland tufted; cæca absent.

The Barbets are spread over Africa, southern Asia and central and south America; the Asiatic species appears to be almost entirely frugivorous, but those of Africa certainly eat insects as well as fruit to a considerable extent.

Though little is known of the nesting habits of the South African species yet, so far as observations go, they conform in this respect to what is known of those of other regions; like the Woodpeckers they excavate nest-holes in tree trunks and lay white glossy eggs on the bare wood or on a few chips only. Barbets do not climb like Woodpeckers, though they sometimes rest on a vertical tree trunk.

Key of the Genera.

- A. Upper mandible toothed (except *T. affinis*).
 a. Breast feathers normal *Lybius*, p. 157.
 b. Shafts of the breast feathers produced into
 fine hairs *Tricholama*, p. 160.

B. Upper mandible smooth.

a. Tail square.

a¹. Culmen strongly ridged between the nostrils; wing somewhat pointed.....

Stactolæma, p. 163.

b¹. Culmen almost flat; wings rounded.....

Barbatula, p. 166.

b. Outer tail feathers considerably shorter than the others; culmen rounded; bill curved

Trachyphonus, p. 170.

Genus I. LYBIUS.

Type.

Lybius, *Hermann, Tab. Affin. Anim.* pp. 217, 235

(1783) L. abyssinicus.

Melanobucco, *Shelley, Ibis*, 1889, p. 476 L. bidentatus.

Edge of the upper mandible with a very distinct tooth; culmen rounded between the nostrils and curved throughout; a naked space round the eye; chin angle naked with a few scattered bristles; breast feathers normal with hair-like shafts; wing rounded, the secondaries falling short of the longest primaries by less than the length of the first toe without claw; anterior outer (*i.e.*, third) and posterior outer (*i.e.*, fourth) toes approximately equal; tail short and slightly rounded.

This genus is confined to Africa, whence fifteen species are recognised by Shelley; only one of these is found within our limits.

449. **Lybius torquatus.** *Black-collared Barbet.*

Le Barbu à plastron noir, *Levaill. Barbus*, p. 65, pl. 28 (1806).

Bucco torquatus, *Dumont, Dict. Sci. Nat.* iv, p. 56 (1806).

Bucco nigrithorax, *Cuv. Règne An.* p. 428 (1817).

Læmodon nigrithorax, *Gurney, Ibis*, 1862, p. 32 [Natal]; *Layard,*

B. S. Afr. p. 233 (1867); *id. Ibis*, 1871, p. 226 [Kanye].

Pogonorhynchus nigrithorax, *Kirk, Ibis*, 1864, p. 328 [Zambesi].

Pogonorhynchus torquatus, *Marshall, Mon. Capit.* p. 19, pl. 10 (1871);

Buckley, Ibis, 1874, p. 367 [Pretoria dist.]; *Shelley, Ibis*, 1875, p. 82

[Pinetown]; *Barratt, Ibis*, 1876, p. 200 [Rustenburg]; *Sharpe, ed.*

Layard's B. S. Afr. pp. 172, 811 (1876-84); *Ayres, Ibis*, 1879,

p. 296; *Holub & Pelz. Orn. Süd-Afr.* p. 161 (1881); *Shelley, Ibis*,

1882, p. 248 [Umfuli River]; *Butler, Feilden, and Reid, Zoologist*,

1882, p. 208 [Ladysmith], *Rendall, Ibis*, 1896, p. 163 [Barberton].

Melanobucco torquatus, *Shelley, Ibis*, 1889, p. 476; *id. Cat. B. M.* xix,

p. 24 (1891); *id. B. Afr.* i, p. 126 (1896); *Marshall, Ibis*, 1896, p. 242

[Salisbury dist.]; *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 405,

500 [Zululand]; *Sowerby, Ibis*, 1898, p. 572 [Chiquaqua];

Woodward Bros. Natal B. p. 109 (1899); *Marshall, Ibis*, 1900, p. 251; *Alexander, Ibis*, 1900, p. 426 [Zumbo]; *Ivy, Ibis*, 1901, p. 22 [Albany].

“Isikurukuru” of the Zulus (Woodward).

Description. Adult.—Forehead and part of crown, cheeks, ear-coverts, chin and throat bright scarlet, hinder part of crown, nape and upper mandible and a collar extending round the neck and upper breast black; rest of the back and wing-coverts brown with delicate yellow vermiculations; rump and upper wing-coverts most strongly washed with yellow; wing-quills brown with sulphur-yellow on the outer webs of the feathers, most conspicuous on the inner

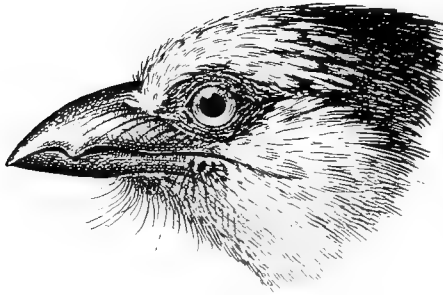


FIG. 51.—*Lybius torquatus*. $\times \frac{1}{4}$.

secondaries; tail-feathers brown also with slight yellow edging; rest of the lower surface sulphur-yellow, mottled especially on the flanks with ashy-black blotches and vermiculations; axillaries and under wing-coverts creamy-white.

Iris reddish-brown; bill black; legs and feet dark brown.

Length about 7·5; wing 3·6; tail 2·3; culmen 0·80; tarsus 0·88.

The sexes are alike in plumage.

An example from Komatipoort in the eastern Transvaal shows some approach to *L. irroratus*, the east African sub-species, which is distinguished by the more marked freckling of the back and wing-coverts.

The young bird is duller than the adult, the entire head, throat and chest being a dingy purplish-black, leaving only little scarlet at the sides of the head; bill brown.

Distribution.—This Barbet is found only in the eastern portion

of the Colony from Grahamstown onwards through Natal and the Transvaal as far as Kanye in Bechuanaland and northwards to Mashonaland and the Zambesi valley; beyond our limits it occurs in Angola and Nyasaland, but is replaced by a closely-allied species in German east Africa.

South African localities are as follows: Cape Colony—Albany (Ivy), Stockenström (Atmore), Peddie (S. A. Mus.), East London (Rickards), Port St. John's (S. A. Mus.); Natal—Durban (Bt. Mus.), Pinetown (Shelley), Ladysmith (Harkness), Echowe and St. Lucia Lake (Woodward); Transvaal—Swaziland (Buckley in Bt. Mus.), Barberton (Rendall), Komatipoort (Francis in S. A. Mus.), Pretoria and Rustenburg dist. (Barratt); Bechuanaland—Kanye (Exton); Rhodesia—Umfuli river (Ayres), Salisbury dist. (Marshall); Portuguese east Africa—Tete and Shupanga (Kirk in Bt. Mus.), Zumbo (Alexander).

Habits.—The Black-collared Barbet is found singly or in pairs about large trees towards the edges of woods, and generally near water; it also frequents gardens and farm-houses, and is bold and fearless. It has a loud harsh note, "Kook Koorroo," repeated eight or nine times in succession. The male and female often perch close to one another and answer each other in turn; as they give vent to their loud cry they bob their heads up and down in a most comical fashion as if bowing to one another. The flight is headlong and swift. This Barbet appears to subsist chiefly on fruit and berries, which it swallows whole, and it is for this purpose that it visits gardens. Woodward states that it also devours insects in considerable numbers.

Like a Woodpecker it makes round holes in the trunks of trees in which to deposit its eggs; a clutch of three taken by Mr. A. D. Millar at Umgeni, near Durban, on December 10, is preserved in the South African Museum. They are pure white, somewhat elongated ovals, and measure 0.96×0.69 .

According to Mr. Ivy the eggs appear to be sometimes laid before the nest-hole is ready, as he found in November, below a decayed willow tree overhanging a stream, four eggs quite fresh and obviously just deposited, while a pair of birds were boring away into the trunk above.

Genus II. **TRICHOLÆMA.***Type.*

Tricholæma, *J. & E. Verr. Journ. Ornith.* 1885,
p. 132 *T. hirsutum*.

Edge of the upper mandible distinctly toothed (except in *T. affinis*); culmen rounded between the nostrils and curved from base to tip; chin angle with a few scattered bristles; breast feathers with shafts produced into long hair-like tips; wings, feet, and tail as in *Lybius*; plumage always with yellow spots.

This genus, containing twelve recognised species, is confined to Africa; of the two found in South Africa, *T. affinis* is not improbably merely the young of the *T. leucomelas*.

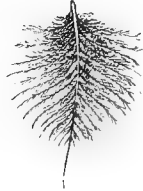


FIG. 52.—Breast feather of *Tricholæma leucomelas*.

Key of the Species.

- A. Crown red; bill strongly toothed..... *T. leucomelas*, p. 160.
B. Crown black; bill without or with only traces of
a tooth *T. affinis*, p. 162.

450. **Tricholæma leucomelas.** *Pied Barbet.*

- Bucco leucomelas*, *Bodd. Tabl. Pl. Enl.* p. 43 (1783).
Bucco niger, *Gmel. Syst. Nat.* i, p. 407 (1788); *Burchell, Travels*, i,
p. 318 (1822).
Laimodon niger, *Grill, K. Vet. Akad. Handl. Stockholm*, ii, no. 10,
p. 44 (1858) [Oudtshoorn].
Laimodon leucomelas et unidentatus, *Layard, B. S. Afr.* pp. 232, 233
(1867).
Pogonorhynchus leucomelas, *Marshall, Monogr. Capit.* p. 23, pl. 12
(1870); *Ayres, Ibis*, 1871, p. 261; *Gurney in Andersson's B.*
Damaraland, p. 217 (1872); *Buckley, Ibis*, 1874, p. 367 [Pretoria];
Barratt, Ibis, 1876, p. 200 [Marico]; *Sharpe, ed. Layard's B. S. Afr.*
pp. 173, 811 (1876-84); *Ayres, Ibis*, 1877, p. 342 [Rustenburg];

Oates, Matabeleland, p. 305 (1881); *Symonds, Ibis*, 1887, p. 329 [Kroonstad]; *Rendall, Ibis*, 1896, p. 168 [Barberton].
Pogonorhynchus niger, Holub & Pelz. Orn. Süd-Afr. p. 161 (1882).
Tricholæma leucomelan, Shelley, Ibis, 1889, p. 476; *id. Cat. B. M.* xix, p. 31 (1891); *id. B. Afr. i*, p. 127 (1896); *Sharpe, Ibis*, 1897, p. 500 [Zululand]; *Woodward Bros. Natal B.* p. 109 (1899); *Ivy, Ibis*, 1901, p. 22 [Port Elizabeth].

Description. Adult.—Crown of the head red; a conspicuous eyebrow, yellow in front, becoming white posteriorly; back and wing-coverts black with oval spots of sulphur-yellow, the rump and upper tail-coverts almost entirely yellow; scapulars and inner secondaries black edged with white; wings and tail-quills brownish-black edged with sulphur-yellow; a black stripe runs through the eye and ear-coverts bordered by a broad white malar stripe; chin and throat black; rest of the under parts, including the under wing-coverts, white, the flanks and under tail-coverts with a few black streaks.

Iris dark brown; bill, with a considerable notch on the edge of the upper mandible, black; legs and feet grey-black.



FIG. 53.—*Tricholæma leucomelas*. $\times \frac{1}{2}$.

Length 6·3; tail 1·95; wing 3·3; culmen 0·80; tarsus 0·85.

The sexes are alike, and the young birds are somewhat duller in colour, and have the black streaks on the lower surface more numerous and conspicuous.

Distribution.—The Pied Barbet is fairly abundant throughout the greater part of our area from the Cape division to the Okavango, with the exception of Natal proper and Mashonaland, where it has not yet been met with. Beyond our limits it extends only into Angola.

The following are the chief recorded localities: Cape Colony—Cape, Malmesbury, and Clanwilliam (S. A. Mus.), Beaufort West, Colesberg, and Hopetown (Layard), Middelburg (S. A. Mus.), Orange river at Prieska (Burchell), at Upington (Bradshaw in S. A. Mus.), and near Aliwal North (Whitehead), Kuruman (Layard), Swellendam (Layard), Oudtshoorn (Victorin), Albany (Layard), and Port Elizabeth (Ivy); Zululand—Umlalas river (Woodward); Orange River Colony—Kroonstad (Sowerby); Vredefort Road (B. Hamilton); Transvaal—Swaziland (Buckley in Bt. Mus.), Barberton (Rendall), Pretoria (Buckley), Rustenburg (Ayres); Bechuanaland—Ngami region (Andersson); Rhodesia—Tati river (Oates); German south-west Africa—northern Great Namaqualand to the Okavango (Andersson).

Habits.—This bird is found as a rule among the mimosa bushes which line the watercourses throughout South Africa; here, singly or more rarely in pairs, it sits and gives forth its loud-ringing and far-sounding, characteristic note, which would hardly be credited to so small a bird. The cry which is usually heard in early morning is something like “poo-poo-poop” in three syllables constantly repeated. Much energy appears to be required for this effort, and while it is going on the body of the little bird is violently jerked up and down. Like other Barbets, the main portion of its diet consists of fruits, but it will also eat other things, such as insects and seeds, if necessary; in confinement, it has been known to eat bread and meat. When feeding on fruit it often suspends itself below the branch like a tit or a mousebird, and makes its meal hanging in this position. Layard found these birds breeding on a farm in the Albany division in a hole in the stem of an aloe excavated by themselves, and described their eggs as white, elongated, and somewhat rough, measuring about 0.92×0.60 . Ivy found a breeding place at Walmer, near Port Elizabeth, in November. It was a hole about $1\frac{1}{2}$ inches in diameter in an old tree trunk; the passage was inwards about two inches, and then downwards about six. At the bottom were four white eggs resting merely on some fragments of rotten wood.

451. *Tricholæma affinis*. *Shelley's Barbet*.

Pogonorhynchus affinis, *Shelley*, *P. Z. S.* 1879, p. 680; *Sharpe*, *ed. Layard's B. S. Afr.* i, p. 811 (1884).

Tricholæma affine, *Shelley*, *Cat. B. M.* xix, p. 31, pl. ii, fig. 2 (1891); *id. B. Afr.* i, p. 127 (1896).

Description. Female.—Closely resembling *T. leucomelas* in every respect except that the crown is entirely black and without a trace of crimson; the beak is smaller and paler and without or with only slight indications of the tooth so clearly marked in the other species.

Length 5·2; wing 2·95; tail 1·30; culmen 0·60; tarsus 0·80.

It is quite possible that this species may be only the young of the former one, *T. leucomelas*.

Distribution.—The type of the species was obtained at Weenan in Natal by Mr. W. Arnold, there is another example also in the British Museum from Hopetown in the north part of the Colony, while the South African Museum possesses a specimen obtained at Omaruru in Damaraland by Mr. Eriksson.

Genus III. STACTOLÆMA.

Type.

Stactolæma, *Marshall, P. Z. S.* 1870, p. 118*S. anchietae*.

Smilorhis, *Sundev. Av. Meth. Tent.* p. 75 (1872)*S. leucotis*.

Upper mandible smooth without any tooth; culmen ridged or sometimes even sharply keeled between the nostrils; chin moderately bristled; nostrils visible, but slightly overhung by bristles, which, however, are not so well developed as in the other genera; wing rather pointed, the difference between the primaries and secondaries about equal to half the length of the tarsus; tail square; plumage somewhat dull.

Like others of the family this genus is confined to Africa; some ten species have been described.

Key to the Species.

- A. Crown and back black; ear-coverts white..... *S. leucotis*, p. 163.
 B. Crown yellow; back brown, ear-coverts white... *S. sowerbyi*, p. 164.
 C. Crown dark brown; back green; ear-coverts sulphur-yellow *S. woodwardi*, p. 165.

452. **Stactolæma leucotis.** *White-eared Barbet.*

Megalæma leucotis, *Sundevall, Ofvers. K. Vet. Akad. Forhandl.* 1850, p. 109; *Layard, B. S. Afr.* p. 234 (1867); *Finsch & Hartlaub, Vög. Ost-Afr.* p. 505 (1870) [Inhambane].

Barbatula leucotis, *Marshall, Monogr. Capit.* p. 131, pl. 52 (1871); *Gurney, Ibis*, 1873, p. 255 [Natal].

Smilorhis leucotis, *Sharpe, ed Layard's B. S. Afr.* p. 177 (1876); *Shelley, Cat. B. M.* xix, p. 37 (1891); *id. B. Afr.* i, p. 127 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 402, 420, 500 [Zululand]; *Woodward Bros. Natal B.* p. 110 (1899).

Description. Adult.—Head and nape, ear-coverts, chin and throat black, the shafts of the frontal feathers stiff and shining; mantle brown; wings and tail dusky-brown; rump and upper tail-coverts black, white at the sides; a white band from behind the eye to the sides of the neck; upper breast, sides of the body and flanks brown, some of the feathers of the flanks dappled with white; lower breast, abdomen, under tail- and wing-coverts white; quills somewhat silvery below, the inner ones white on the inner webs. Bill, without notch, black; legs and feet black.

Length about 6·25; wing 3·5; tail 2·10; culmen 0·60; tarsus 0·85.

Distribution.—The type of this species was obtained by Wahlberg in "Lower Caffraria" (*i.e.*, Natal). The Woodwards noticed it on the Tugela and lower Umfolosi rivers and at Echowe in Zululand, and Peters many years ago at Inhambane in Portuguese east Africa. Mr. Millar has an example obtained by his brother at Barberton in the Transvaal. North of the Zambesi it is found in Nyasaland.

Habits.—The White-eared Barbet appears to be a rare bird, at any rate in collections. The Woodwards, who are the only collectors who have recorded any observations on its habits, state that it flies about the taller trees in small parties uttering a loud and sonorous cry. It chiefly affects the thorn country.

453. *Stactolæma sowerbyi*. *Sowerby's Barbet.*

Stactolæma sowerbyi, *Sharpe, Bull. B. O. C.* vii, p. 36 (Febr. 1898); *id. Ibis*, 1898, p. 297.

Smilorhis sowerbyi, *Sowerby and Sharpe, Ibis*, 1898, p. 572, pl. 12, fig. 1.

Description.—General colour above, brown, wings blackish-brown with whitish margins to the quills; tail ashy; forehead and occiput pale sulphur-yellow; feathers below the eye and ear-coverts hoary-white; chin white, throat and fore-breast blackish, becoming paler posteriorly, some of the feathers tipped with white; tibial feathers white.

Length 6·6; wing 3·75 (Sharpe).

Distribution.—This species was first obtained by Mr. Sowerby in

the neighbourhood of Fort Chiquaqua in Mashonaland eighteen miles E.S.E. of Salisbury. It also occurs in Nyasaland.

Habits.—Mr. Sowerby states that this is a fairly common bird both about kopjes and in the “bush veld.”

454. **Stactolæma woodwardi.** *Woodward's Green Barbet.*

Stactolæma woodwardi, *Shelley, Bull. B. O. C.* v, p. 3 (1895); *id. Ibis*, 1896 p. 133; *id. B. Afr.* i, p. 129 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 404, 501, pl. 10; *Woodward Bros. Natal B.* p. 112, plate at frontispiece (1899).

Description. *Adult.*—Crown and nape dark olive-brown, rest of the upper surface including the tail olive-green; wing-quills dusky-brown, all, except the first three, edged with olive-green; a patch behind the eye extending over the ear-coverts, sulphur-yellow; below, ashy-olive throughout, slightly more dusky on the chin;



FIG. 54.—*Stactolæma woodwardi.*

axillaries, under wing-coverts and inner lining of the quills buffy-white.

Bill, legs and feet dark horn.

Length about 6.25; wing 3.40; tail 2.05; culmen 0.70; tarsus 0.90.

Sexes alike.

Distribution.—This Barbet has hitherto been obtained only in the Umgoye forest in Zululand by the Woodwards.

Habits.—Messrs. Woodward give the following account of the species. “We shot our first specimen in the early part of September, 1895. After this we often heard a peculiar monotonous cry of ‘chop chop,’ constantly repeated, proceeding from the

thickly foliaged trees, which we found to be the note of this Barbet. Towards the end of the month, and in October, they become more abundant, and we saw them continually feeding on the berries which grow in the more open parts of the woods. The following season we paid a second visit to this forest towards the end of August, and found them plentiful, and obtained specimens of both male and female birds, which are identical in plumage."

Genus IV. BARBATULA.

Type.

Barbatula, *Less. Compl. Buff.* ix, p. 292 (1837) ... *B. erythronota*.

Edge of the upper mandible smooth and not hooked; culmen narrow between the nostrils and almost flat, not ridged, almost straight from base to tip; nostrils somewhat overhung by bristles; a few bristles on the chin; wing rounded, and the difference between the inner secondaries and longest primaries less than half the length of the tarsus.

Three out of sixteen species, all African, are found within our limits.

Key of the Species.

- A. Fore part of crown crimson *B. pusilla*, p. 166.
 B. Fore part of crown yellow *B. extoni*, p. 168.
 C. Whole of the crown and mantle black *B. bilineata*, p. 169.

455. **Barbatula pusilla.** *Tinker Bird.*

Le Barbion mâle, *Levaill. Barbus*, p. 73, pl. 32 (1806).

Bucco pusillus, *Dumont, Dict. Sci. Nat.* iv, p. 50 (1806).

Bucco barbatula, *Temm. Pl. Col.* iii, *Bucco*, pp. 18, 19 (1831).

Barbatula minuta (*nec Bp.*) *Gurney, Ibis*, 1864, p. 353.

Megalaima barbatula, *Layard, B. S. Afr.* p. 234 (1867); *id. Ibis*, 1869, p. 372 [Grahamstown].

Barbatula pusilla, *Marshall, Monogr. Capit.* p. 117, pl. 48 (1871); *Sharpe, ed. Layard's B. S. Afr.* p. 175 (1876); *Shelley, Cat. B. M.* xix, p. 39 (1891); *id. B. Afr.* i, p. 128 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 404, 500 [Zululand]; *Woodward Bros. Natal B.* p. 110 (1899).

"Ipengempe" of Natal Zulus (Woodward).

Description. *Adult male.*—Forehead and front portion of the crown scarlet, bordered below by a narrow black frontal band; hinder part of the crown, nape and mantle black with sulphur-

yellow streaks; rump and upper tail-coverts sulphur-yellow; wing-quills and coverts black, washed externally with golden-yellow; a few of the inner secondaries with sulphur-yellow edges; tail black with sulphur-yellow edges; ear-coverts and cheeks black and white; below, sulphur-yellow throughout; under wing-coverts and inner lining of the quills white.

Iris dark brown; bill black; legs and feet dark greenish-ash.

Length about 5·5; wing 2·35; tail 1·40; culmen 0·40; tarsus 0·70.

The sexes are alike in colour, but the female is a little smaller.

Distribution.—The Tinker bird is found in the eastern portion of the Colony, Natal and Zululand, and appears to be chiefly con-



FIG. 55.—*Barbatula pusilla*. $\times \frac{1}{4}$.

fined to the low-lying forests and districts near the coast. It is recorded from Grahamstown (Layard), Stockenstroom (Atmore), East London (Rickards), and Port St. John's (S. A. Mus.) in the Colony; from Durban (Bt. Mus.), Pinetown (Ayres), Echowe and St. Lucia Lake (Woodward) in Natal.

Habits.—The Tinker bird derives its name from its loud and monotonous note, which, with its metallic ring, most nearly resembles the tapping of a hammer on an anvil; it is heard chiefly at mid-day during the spring and summer; in winter it is silent. The voice of this bird is somewhat ventriloquial in character, so that it is often difficult to locate it from sound alone. Although fairly numerous it is seldom seen as it sits on the top of thick bushy trees well out of sight. The Tinker bird feeds principally on fruits, but also to a certain extent on insects; the Woodwards found in the stomach of one shot by them a waxy substance intermixed with the remains of insects, probably bees and honey-comb.

456. *Barbatula extoni*. *Exton's Tinker Bird*.

Barbatula extoni, *Layard, Ibis*, 1871, p. 226 [Kanye]; *Sharpe, ed. Layard's B. S. Afr.* pp. 176, 811 (1876-84); *Ayres, Ibis*, 1879, p. 296 [Rustenburg]; *Holub & Pelzein Orn. Süd-Afr.* p. 162 (1882); *Shelley, Ibis*, 1882, p. 248; *Ayres, Ibis*, 1884, p. 226; *Shelley, Cat. B. M.* xix, p. 43 (1891); *id. B. Afr.* i, p. 128 (1896); *Alexander, Ibis*, 1900, p. 427 [Zumbo].

Description. *Adult male*.—Forehead orange, bordered below by a narrow frontal stripe of black; crown, nape, mantle and inner secondaries black with yellowish-white streaks, upper tail-coverts pale sulphur-yellow; tail, wing-quills and coverts black; the tail-feathers, primary coverts, and inner secondaries margined with yellowish-white, the primary quills and median and lesser coverts with golden-yellow; ear-coverts black, bordered below by a white line which runs forward under the eyes to the lores, this again is separated from the sulphur-yellow throat by another black line from the base of the bill; rest of the lower surface pale yellow of an ochreous tinge.

Iris dusky umber; bill black; legs and feet dusky brown.

Length about 4·75; wing 2·5; tail 1·30; culmen 0·45; tarsus 0·60.

The female resembles the male in plumage, but is slightly smaller (wing 2·4).

Distribution.—The types of this species described by Layard were obtained by Dr. Exton at Kanye, in Bechuanaland, whence it is spread over the northern part of the Transvaal and through Rhodesia to the Zambesi; north of that river it has been noted in Angola and Nyasaland. The following are recorded localities: Transvaal—Rustenburg (Ayres), Marabastad in Zoutspansberg (S. A. Mus.); Bechuanaland—Kanye (Exton); Rhodesia—Umfuli river (Ayres); Portuguese east Africa, near Zumbo (Alexander).

Habits.—Mr. Ayres gives the following account: "This Barbet is not at all uncommon in the Magaliesbergen, but, being an inconspicuous little bird, is easily overlooked; those I saw were always on or near a species of mistletoe; this, during our winter months, is well covered with berries, upon which the birds feed. Having nipped off a berry, the bird with its head well up cleverly divides it and discards the fruity shell, when the kernel seems to slip down its throat unawares, and the bird has a comical look as if astonished at the result. Those I saw were solitary; the note is peculiarly

loud for so small a bird." On another occasion he states that Mr. Lucas found a nest of this barbet containing young ones in December. The birds had bored a hole in the rotten branch of a tree for a nesting place.

457. **Barbatula bilineata.** *White-browed Tinker.*

Megalæma bilineata, *Sundev. Ofvers. K. Vet. Akad. Forhandl.* 1850, p. 109; *Layard, B. S. Afr.* p. 234 (1867).

Barbatula bilineata, *Marshall, Monogr. Capit.* p. 125, pl. 50, fig. 2 (1871); *Sharpe, ed. Layard's B. S. Afr.* p. 176 (1876); *W. Ayres, Ibis*, 1887, p. 52 [Oliphant's river]; *Shelley, Cat. B. M.* xix, p. 44, pl. iii, fig. 2 (1891); *id. B. Afr.* i, p. 128 (1896); *Sharpe, Ibis*, 1897, p. 500 [Zululand]; *Woodward Bros. Natal B.* p. 111 (1899); *id. Ibis*, 1900, p. 521.

Description. *Adult.*—Crown of the head and back black; rump rich golden-yellow almost concealing the black upper tail-coverts; wings and tail black, the median and greater coverts, wing- and tail-quills all edged with sulphur-yellow; streak through the eye and ear-coverts black, bordered above and below by a white streak above and below the eye, the latter meeting its fellow on the forehead above the bill; a malar stripe of black separates this latter from the ashy-white throat and fore neck; rest of the under surface sulphur yellow, paler on the flanks and under tail-coverts; axillaries, under wing-coverts and inner lining of the quills white.

Bill black; legs and feet ash colour.

Length about 4·0; wing 2·20; tail 1·40; culmen 0·45; tarsus 0·68. Sexes alike.

Distribution.—This bird was first procured many years ago by Wahlberg in Lower Caffraria; it was not again met with till 1885, when it was found by Mr. W. Ayres on the extreme north-east boundary of the Transvaal, near the Oliphant river. Recently the Woodwards have secured a good many specimens in Zululand, at Echowe, Umgoye, Umlalas river and St. Lucia Lake.

Beyond our limits it is recorded from Mt. Chiquaqua in Nyasaland.

Habits.—Mr. W. Ayres found a pair of these little birds flying round about a tall acacia tree hunting insects. The Woodwards state that they are more conspicuous than the common Tinker bird, as they frequently come out into the sunshine and search the foliage of trees for food. Their note closely resembles that of the commoner species.

Genus V. **TRACHYPHONUS.***Type:*

Trachyphonus, *Ranzani, Elem. Zool. Ucc. iii, pt. 2,*
 p. 159 (1821) **T. cafer.**

Edges of the upper mandible smooth without tooth; culmen rounded between the nostrils and boldly curved from base to tip; nostrils large and exposed, not concealed by the bristles, which are but poorly developed; a bare space round the eye; chin bristles few and small; wing rounded, tail somewhat graduated; the difference between the length of the inner and outer feathers about half the length of the tarsus.

According to Shelley this genus contains four species, all of which are confined to Africa; only one of these is found within our area.

458. **Trachyphonus cafer.** *Levaillant's Barbet.*

Le Promepic, *Levaill. Promerops*, p. 77, pl. 32 (1806).

Picus cafer, *Vieill. N. Dict. H. N. xxiv*, p. 102 (1818).

Trachyphonus vaillanti, *Ranzani, Elem. Zool. Ucc. iii, pt. 2*, p. 159 (1821).

Polysticte quopopa, *Smith, Rep. Exp. Centr. Afr.* p. 53 (1836).

Capito vaillanti, *Layard, B. S. Afr.* p. 235 (1867).

Trachyphonus cafer, *Marshall, Monogr. Capit.* p. 139, pl. 36 (1870); *Layard, Ibis*, 1871, p. 226 [Kanye]; *Ayres, ibid.* p. 260; *Buckley, Ibis*, 1874, p. 368; *Barratt, Ibis*, 1876, p. 200 [Rustenburg]; *Ayres, Ibis*, 1879, p. 295; *Oates, Matabeleland*, p. 306 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 162 (1882); *Shelley, Ibis*, 1882, p. 249 [Bechuanaland]; *Hartlaub, Ibis*, 1886, p. 107; *Shelley, Cat. B. M.* xix, p. 100 (1891); *id. B. Afr.* i, p. 129 (1896); *Sharpe, Ibis*, 1897, p. 501 [Zululand]; *Woodward Bros. Natal Birds*, p. 111 (1899) *Marshall, Ibis*, 1900, p. 251 [Mashonaland]; *Alexander, ibid.* p. 427 [Zambesi].

Description. Adult male.—Front half of crown and sides of the head and face including the ear-coverts and cheeks sulphur-yellow, the feathers tipped with red; a strong crest on the hinder part of the crown black; mantle, wings and tail black, most of the feathers tipped and spotted with white; lower back and rump sulphur-yellow, upper tail-coverts crimson; chin and throat sulphur-yellow followed by a broad black pectoral band, a few of the feathers of which are tipped with rosy-white, a white patch on either side below the black pectoral band extending somewhat imperfectly across the chest; rest of the lower surface sulphur-yellow, the

lower breast streaked with crimson and the lower tail-coverts also tinged with the same colour; under wing-coverts and inner lining of the quills ashy-white.

Iris reddish-brown to blood-red; bill light yellowish-green tipped with bluish or dusky; legs and feet dusky-ash.

Length about 8·0; wing 3·8; tail 3·15; culmen 0·95; tarsus 1·1.

In the female the black pectoral band is not so broad, and the red streaks on the lower breast are less marked; the dimensions are about the same.

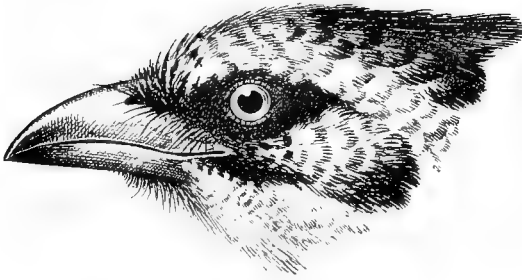


FIG. 56.—*Trachyphonus cafer*. $\times \frac{1}{4}$.

Distribution.—Levaillant's Barbet appears to be most abundant in the Rustenburg division of the Transvaal, whence it extends to Bechuanaland, Rhodesia, and Natal, where, however, it appears to be rare. It has recently been obtained from Nyasaland and has once occurred in southern Angola.

The following are recorded localities: Natal—Weenen (Bt. Mus.), Verulam and Echowe (Woodward); Transvaal—Lydenburg dist. (Francis in S. A. Mus.), Rustenburg (Ayres and Barratt); Bechuanaland—Kanye (Exton), Boatlenami (Ayres); Rhodesia—Hanyani river (Marshall); Portuguese east Africa—Tete (Kirk).

Habits.—Levaillant's Barbet is not a shy bird though quiet and not often noticed; it is generally found in thick bush whence its loud and peculiar note can be sometimes heard; Ayres compared this to an alarum clock going off and constantly repeated every few minutes. Sometimes the bird sits on a conspicuous dead branch to go through this performance, and can be seen to jerk its body forward and throw up its bill when producing this sound. Like other Barbets it has a mixed diet consisting of fruits and berries, leaves and insects; Marshall obtained one feeding on the ground among

some gigantic ant heaps, and afterwards found its stomach contained only termites. Major Sparrow of the 7th Dragoon Guards informs me that he recently found four young birds of this species in a hole in a branch of a fig-tree at Waschbank in Natal, on Nov. 7th.

Suborder VI. COCCYGES.

Plantar tendons Galline, *i.e.*, as in *Passeres*, but connected by a vinculum so that the flexor longus hallucis supplies the hallux only, and the flexor perforans digitorum leads to the second, third, and fourth digits (fig. 2*b*, p. 2); palate desmognathous; ambiens muscle present.

Family I. CUCULIDÆ.

Bill of varying shape; wings with ten primaries; feet zygodactyle, the first and fourth toes directed backwards; tail feathers ten in number (except in some American genera); habits generally parasitic.

Anatomical characters, are: cæca present; both carotids present; contour feathers without after-shaft; oil gland present but nude.

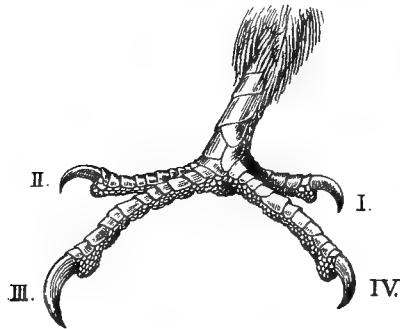


FIG. 57.--Left foot of *Cuculus gularis*, toes numbered. $\times \frac{1}{2}$.

Cuckoos are distributed all over the world though most numerous in tropical countries; they vary greatly in habits and nidification, some being parasitic in this respect, others building nests for themselves.

Key of the Genera.

- A. Wings long and pointed; difference between the length of the primaries and secondaries greater than the length of the tarsus (*Cuculinæ*).
- a. No occipital crest.
- a'. Plumage never metallic; sexes alike *Cuculus*, p. 174.
- b'. Plumage brilliantly metallic; sexes dissimilar *Chrysococcyx*, p. 184.
- b. A strong crest on the head..... *Coccytes*, p. 192.
- B. Wings short and rounded; the difference between the primaries and secondaries about half the length of the tarsus (*Centropinæ*).
- a. Hind claw elongated to twice the length of the others, straight and lark-like *Centropus*, p. 202.
- b. Hind claw curved and normal, not longer than the others *Ceuthmochares*, p. 210.

Subfamily I. CUCULINÆ.

Wings long, pointed and flat, not fitting to the sides of the body; distance between the tips of the primaries and secondaries greater than the length of the tarsus or culmen; tarsus more or less feathered in front and also covered by the long thigh feathers.

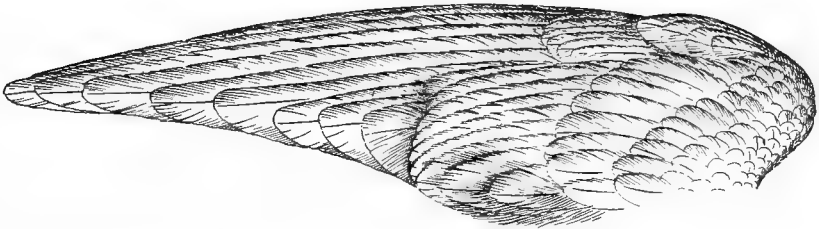


FIG. 58. Wing of *Cuculus gularis*. $\times \frac{1}{2}$.

Anatomical characters are: the absence of the femoro-caudal muscle in the thigh, and the presence of a simple undivided band of feathers on each side of the naked pectoro-ventral tract. Nearly all the birds contained in this subfamily are of parasitic habits.

Genus I. **CUCULUS.***Type.***Cuculus**, *Linn. Syst. Nat.* 12th ed. i, p. 168 (1766) *C. canorus*.

Bill moderate, nostrils somewhat rounded and pierced in a swollen membrane; no crest on the head; wings long and pointed, the third quill the longest, exceeding the secondaries by almost half the length of the wing; tail shorter than the wings and graduated. Plumage of the adult slaty or black, never metallic, that of the young bird usually barred. This genus is spread over the whole of the Old World except the Pacific Islands; out of seven African species, five reach our limits, two of them, however, being only visitors from the northern hemisphere.

Cuckoos are birds of strong flight and remarkable habits, they are most of them migratory and have a loud and resonant note which renders them well known in every country. They do not pair but indulge in promiscuous intercourse, and the females deposit their eggs in the nests of other birds. It is now generally agreed that, as Levaillant stated a century ago, the female bird lays her egg on the ground and conveys it in her mouth to the nest selected. In the case of the European cuckoo, the parent apparently takes no further heed of her eggs or young, but one or two observations made in this country seem to point to the fact that the parents hang round the nest of the foster bird and perhaps sometimes assist to feed the callow young one.

Key of the Species.

- A. Slaty above, barred below.
- a.* Throat grey.
- a*¹. Beak yellow except the extreme tip; outer tail-feather barred with white... *C. gularis*, p. 174.
- b*¹. Beak black, outer tail-feather spotted along the shaft, with no complete bars.
- a*². Larger, wing 8 to 9 inches; bars on the chest dusky..... *C. canorus*, p. 177.
- b*². Smaller, wing 6 to 7 inches; bars on the chest black..... *C. poliocephalus*, p. 178.
- b.* Throat rich rufous..... *C. solitarius*, p. 178.
- B. Black above and below *C. clamosus*, p. 182.

459. **Cuculus gularis.** *South African Cuckoo.*

Le Coucou vulgaire d'Afrique, *Levaill. Ois. d'Afr.* v, p. 20, pls. 20, 21 (1806).

Cuculus gularis, *Steph. Gen. Zool.* ix, p. 83, pl. 17 (1815); *Ayres, Ibis*, 1859, p. 246 [Natal]; *Layard, B. S. Afr.* p. 249 (1867); *Gurney*

in Andersson's *B. Damaraland*, p. 228 (1872); Sharpe, *P. Z. S.* 1873, p. 585; Buckley, *Ibis*, 1874, p. 366 [Bamangwato]; Sharpe, ed. Layard's *B. S. Afr.* pp. 148, 809 (1875, 84); Shelley, *Ibis*, 1882, p. 245 [Umfuli river]; *id.* *Cat. B. M.* xix, p. 244 (1891); *id.* *B. Afr.* i, p. 123 (1896); Woodward Bros. *Natal B.* p. 115 (1899); Marshall, *Ibis*, 1900, p. 252 [Salisbury].



FIG. 59.—*Cuculus gularis*. $\times \frac{9}{10}$.

Description. Adult male.—General colour above, slaty-grey, wing-quills slightly darker with white bars on the inner webs; outer tail-feathers with about six complete white bars on the inner web, the bars diminish towards the central pair of feathers which are spotted with white along the shaft; throat, sides of the face, neck and upper breast pale grey, rest of the under surface and under wing-coverts white with narrow black transverse bars.

Iris yellowish-brown; bill, including the portion surrounding the

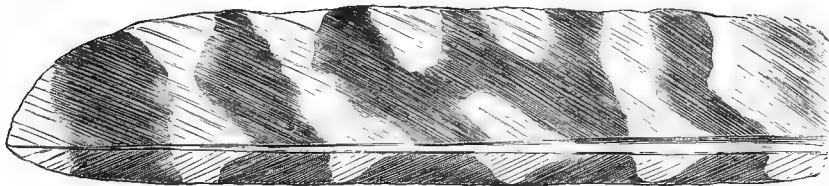


FIG. 60.—Outer tail feather of *Cuculus gularis* (from Sharpe, *P. Z. S.*, 1873).

nostrils, yellow, the terminal half of the upper and third of the lower mandible brown; legs and feet yellow.

Length about 12.75; wing 8.4; tail 6.3; culmen 0.85; tarsus 0.8. The female apparently in some cases differs from the male in having the lower throat and breast suffused with rufous-buff.

Mr. Marshall describes a young bird as having all the feathers of the head and back broadly barred at their tips with greyish or buffish-white and the sides of the face and entire throat barred like the abdomen, except that the bars are closer; there was also a large nape spot of pure white, perhaps a sport.

Iris brown; upper mandible including nostrils blackish, lower mandible blackish at tip, the base yellow; feet pale yellow.

Distribution.—The South African Cuckoo is found in South Africa only in the summer months from October to March; it has not been definitely recorded from Cape Colony and is rare in Natal, but becomes commoner in the Transvaal, Bechuanaland, German territory and Rhodesia. During the cold weather this Cuckoo appears to be spread over the greater part of tropical Africa north of the Zambesi. It has been obtained at Kavirondo, near Victoria Nyanza, in March by Neumann, at Lado on the upper Nile in April by Emin Pasha, in the Niam-Niam country in September by Bohn-doff, and at Witu, in British east Africa in May, by Jackson.

The following are the South Africa localities: Natal—near Durban and Umfolosi valley (Woodward); Orange River Colony—Modder river, near Bloemfontein, October (S. A. Mus.); Transvaal—Zand river in Lydenburg, November (Francis in S. A. Mus.); Bechuanaland—Meathly river near Bamangwato, in October (Buckley), Kanye, January (Ayres); Rhodesia—Umfuli river, October (Ayres), near Salisbury in spring (Marshall); German south-west Africa—Gt. Namaqualand, Otjimbingue, March, Ondonga, January (Andersson), Omaruru, February (Eriksson).

Habits.—This cuckoo seems to be found about small bushes and trees in the open country; it is shy and restless, flying from one tree to another with a rapid and somewhat zig-zag flight. The note is somewhat like that of the European bird but can easily be distinguished, as the two syllables “koo-koo” are on the same note. Ayres states that they arrive in Mashonaland about the middle of September and may sometimes be seen in threes and fours chasing one another, in which case they are less shy and often come within range. In consequence probably of their resemblance to a hawk they are frequently mobbed by small birds. Levaillant is the only author who has noticed anything in regard to their breeding habits, he states that only one egg is deposited in the nest of a Jan Fredrik (*Cossypha caffra*), Coryphee (*Erythropygia coryphæus*), Fiscal (*Lanius collaris*), or Backakiri (*Laniarius bakkakiri*), and that this is olive-grey dotted with red.

460. *Cuculus canorus*. *European Cuckoo*.

Cuculus canorus, *Linn. Syst. Nat.* 12th ed. i, p. 168 (1766); *Gurney in Andersson's B. Damaraland*, p. 227 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 147, 809 (1875-84); *Barratt, Ibis*, 1876, p. 199 [Potchefstroom]; *Ayres, Ibis*, 1877, p. 342, 1884, p. 223; *Dresser, B. Eur.* v, p. 199, pl. 299 (1878); *Shelley Cat. B. M.* xix, p. 245 (1891); *id. B. Afr.* i, p. 124 (1896); *Alexander, Ibis*, 1900, p. 108 [Zambesi]; *Marshall, Ibis*, 1900, p. 252 [Mashonaland].

Description. *Adult male*.—Closely resembling *C. gularis*, being distinguished by its black bill which is only yellow at the extreme base, by its rather broader black transverse markings below, and by the lesser amount of white on the tail; on the outer pair of tail-feathers there are no bars only spots along the shafts, and these on the median pair of feathers are reduced to almost rudimentary proportions.

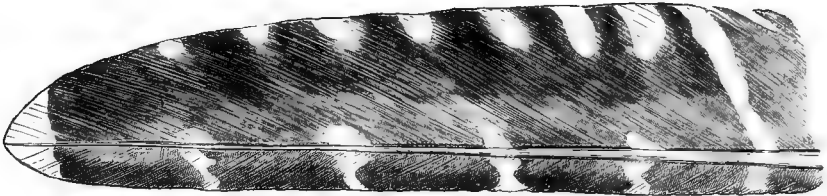


FIG. 61.—Outer tail-feather of *Cuculus canorus* (from Sharpe, P.Z.S., 1873).

Iris and legs yellow; bill bluish-black, except a very narrow margin round the nostrils which is yellow.

Length about 13·25; wing 8·75; tail 7·25; culmen 0·75; tarsus 0·95.

The female differs only from the male in having the throat shaded with rufous. The young bird is dark brown above, the feathers of the head and body are tipped with white and many of them, including those of the wing and tail, barred with rufous; below, the throat and upper breast are barred and somewhat suffused with dark brown.

Distribution.—The European Cuckoo is found throughout the greater part of the Old World from Ireland to the northern portion of Australia; during the European summer it breeds in Europe, northern Africa and Asia as far as the Himalayas, retreating south in winter to southern Asia and Africa.

As far as our present knowledge goes the European Cuckoo does not occur in Cape Colony* nor is it common elsewhere, though Ayres has obtained a good many specimens in the Transvaal. The following are localities: Transvaal—Potchefstroom, December and January (Barratt and Ayres), Lekkerkraal, Waterberg dist., January (Pretoria Mus.); Rhodesia—near Salisbury, January (Marshall); German south-west Africa—Otjimbingue, February, April, and Ondonga, December (Andersson); Portuguese east Africa—Zambesi valley, November, December (Alexander).

Habits.—Little has been noted regarding the habits of the European Cuckoo in South Africa. Ayres describes them as shy and difficult to approach and of rapid flight, and that they were generally to be found among the mimosas. As in Europe they chiefly feed on hairy caterpillars.

South African specimens generally show marks of immaturity and are probably in most cases birds of the year hatched in the northern hemisphere during the previous spring.

461. *Cuculus poliocephalus*. *Smaller Cuckoo*.

Cuculus poliocephalus, *Lath. Ind. Orn.* i, p. 214 (1790); *Shelley, Cat. B.* M. xix, p. 255 (1891); *id. B. Afr.* i, p. 124 (1896).

Description. *Adult.*—Similar to *C. canorus* but much smaller, with the lower plumage, and especially the lower tail-coverts, tinged with buff and with broader black bars on the breast.

Iris brown; bill blackish; base of lower mandible yellow; feet yellow.

Length about 10·0; wing 5·7 to 6·1; tail 4·9 to 5·4; tarsus 0·68.

Distribution.—The Smaller Cuckoo appears to be an Eastern race of the common Cuckoo; it breeds throughout the Himalayas, China and Japan, wintering in India; it is also common in Madagascar where it breeds, and occasionally occurs in Africa south of 6° N. lat. There is an example in the British Museum from Durban, obtained by Gordge, the only record, so far as I am aware, of its occurrence within our limits.

462. *Cuculus solitarius*. *Red-chested Cuckoo*.

Le Coucou solitaire, *Levaill. Ois. d'Afr.* v, p. 35, pl. 206 (1806).

Cuculus solitarius, *Steph. Genl. Zool.* ix, p. 84, pl. 18 (1815); *Gurney, Ibis*, 1860, p. 213; *Layard, B. S. Afr.* p. 248 (1867); *Sharpe, P. Z. S.* 1873, p. 582; *id. ed. Layard's B. S. Afr.* pp. 149, 809 (1875-84); *Ayres, Ibis*, 1876, p. 433 [Lydenburg]; *Butler, Feilden, and Reid, Zool.* 1882, p. 207

* The South African Museum has recently received an example from Mr. Shortridge, shot at Port St. John's in Pondolond in March.

[Newcastle]; *Shelley, Cat. B. M.* xix, p. 258 (1891); *id. B. Afr.* p. 124 (1896); *Woodward Bros. Natal B.* p. 115 (1899); *W. L. Slater, Ibis*, 1899, p. 112 [Inhambane]; *Ivy, Ibis*, 1901, p. 24.

Cuculus capensis (*nec Mull.*) *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 41 (1858).

“Piet mijn vrouw” of Dutch; “Pezukomkono” of Zulus, both names being formed from the note of the bird; the former name is also applied to *Cossypha bicolor*.

Description. Adult male.—Above, dark slate, lighter on the head, darker on the tail; wing-quills with white bars on the inner webs; central tail-feathers with four small spots along the shaft, and the tip white, lateral feathers with spots along the edge of the inner web as well; below, the chin, throat and ear-coverts are grey, with a slight tinge of rufous; the lower throat and breast are rich rufous, the rest of the lower surface, including the under wing-coverts, pale buff strongly barred with black; under tail-coverts sometimes plain, sometimes barred.

Iris reddish-brown; orbital skin lemon-yellow; bill, upper mandible black, lower yellowish, black at tip; legs and feet yellow.

Length 12·5; wing 6·75; tail 6·10; culmen 0·70; tarsus 0·75.

A female differs from the male in having the throat and breast barred like the rest of the under surface, the whole faintly washed with rufous, which, however, is darker on the sides of the lower neck; the dimensions are about the same.

A young bird differs markedly from the adult; the upper surface the throat and centre of the breast are black, most of the feathers with white tips forming a slight freckling; the wing-quills are barred with rufous on both webs, and some of the spots on the edges of the tail-feathers are also rufous.

Distribution.—The Red-chested Cuckoo is found throughout the whole of the Ethiopian region from the Gold Coast and the upper Nile Valley southwards. It is only in the southern summer during the breeding season that it is found in South Africa; during the winter from March to September it apparently migrates to the north of the equator, as it was found in the Bogos country between the Blue Nile and the Sobat in May by Heuglin. So far as is yet known it occurs only in the southern and eastern portions of South Africa from Cape Town to Natal and Portuguese territory.

The following are localities: Cape Colony—Cape div., Nov., Dec., Feb., George, Sept. (Atmore), Knysna, Dec. (Andersson in Bt. Mus.), Albany div. Nov. Dec. (Ivy), King William's Town (Bt. Mus.) Port St. John's, Nov. Dec. (S. A. Mus.); Natal—Ifafa

(Woodward), Durban, Oct., Feb. (Bt. Mus.), Newcastle, Sept. (Butler); Transvaal—Lydenburg dist. January (Ayres); Portuguese east Africa — Inhambane, Feb. (Francis). In Nyasaland and German east Africa it also appears to be only found during the summer months judging from the dates given.

Habits.—This bird, in the neighbourhood of Cape Town, is rather shy and seldom seen, as it usually perches well within the luxuriant foliage of the oak trees. It is, however, very abundant, and the loud and characteristic note, only used by the male, can be heard at almost any time of the day till quite late in the evening. It is impossible to express the cry in words, but it may be briefly described as a clear shrill whistle of three distinct notes, each separated by half a tone, following one another in quick succession. In the suburbs of Cape Town it is first heard at the beginning of October and continues till February.

Like other cuckoos these birds feed on insects and are especially fond of caterpillars. A male obtained in Cape Town on November 14, 1884, was found to have its stomach full of the large hairy caterpillars of a bombycine moth, *Metanastina pithyocampa*.

Levaillant states that this bird lays its eggs in the nest of the Capokvogel (*Ægithalus capensis*), the Jan Fredrik (*Cossypha caffra*), the Reclameur (*Cossypha bicolor*), and the Coryphee (*Erythropygia coryphæus*). This is confirmed by Ivy to a certain extent, who gives an excellent account of the nesting habits of the bird in the neighbourhood of Grahamstown as follows:—

“ In November, 1896, I found an egg of this Cuckoo in the nest of a ‘ Cape Robin ’ (*Cossypha caffra*), together with two eggs of the latter bird.

“ In the same month I found a young Cuckoo of this species in the nest of a Rock-Thrush (*Monticola rupestris*). The nest, which was placed on a ledge of a krantz or cliff, had been extended on either side with a packing of loose moss so as to prevent the young Cuckoo from upsetting it. One broken egg of the Rock-Thrush lay on the ground below the nest. We waited an hour for the foster-parents, which had flown off on our first approach, to return, but they did not do so, although an adult Cuckoo (*C. solitarius*) flew past (fig. 62).

“ In December, 1897, I saw a pair of Cape Robins (*Cossypha caffra*) flying in attendance on a young *Cuculus solitarius*; they were much more demonstrative than is their usual habit with their own young. The two flew before us for over a mile along a water-cut, while the old Cuckoo kept calling out.



FIG. 62.—Nest of *Monicola rupestris*, containing a young bird of *Cuculus solitarius*, reproduced direct from a photograph taken by Mr. Ivy (from Ibis, 1901)

“On November 9, 1897, I found a nest of *Cossypha caffra* in a neighbouring garden, containing two of the usual pinky-cream eggs, one of which had been deposited only that morning. The nest was only about six inches distant from another where, presumably, the same parents had hatched a brood in September. On revisiting the nest the next day I found, in addition to the Robin's eggs, which were quite fresh, an egg of *Cuculus solitarius*, partly incubated.

“In December, 1898, I found another nest of *Monticola rupes-tris* containing two eggs of the Rock-Thrush and one of *Cuculus solitarius*.

“In November, 1899, I found a single egg of *Cuculus solitarius* in a nest of the South African Stone-Chat (*Pratincola torquata*), situated in the wall of an old kraal close to Grahamstown; there were three eggs of the Stone-Chat in the nest.”

463. *Cuculus clamosus*. *Black Cuckoo*.

Cuculus clamosus, *Lath. Ind. Orn.* ii, *Suppl.* p. 30 (1801); *Layard, B. S. Afr.* p. 249 (1867); *Gurney in Andersson's B. Damara-land*, p. 226 (1872); *Sharpe, P. Z. S.*, 1873, p. 587; *Buckley, Ibis*, 1874; p. 367 [Bamangwato]; *Sharpe, ed. Layard's B. S. Afr.* pp. 150, 809 (1875-84); *Oates, Matabeleland*, p. 305 (1881); *Shelley, Cat. B. M.* xix, p. 260 (1891); *Fleck, Journ. Ornith.* 1894, p. 396 [Gt. Namaqualand]; *Shelley, B. Afr.* i, p. 124 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 410, 499 [Zululand]; *Woodward Bros. Natal B.* p. 116 (1899); *Alexander, Ibis*, 1900, p. 109 [Zambesi Valley]; *Ivy, Ibis*, 1901, p. 26 [Albany Dist.].

Le Coucou criard, *Levaill. Ois. d'Afr.* v, p. 28, pls. 204-5 (1806).

Cuculus nigricans, *Swains. Zool. Ill.* (2) i, pl. 7 (1829); *Gurney, Ibis*, 1859, p. 246 [Natal].

Description. Adult male.—Above and below, black glossed with dark green; quills brown with white barring and freckling on the inner web; tail-feathers narrowly tipped with white, under tail-coverts with white or rufous tips; edge of the wing mottled black and white, under wing-coverts black.

Iris dark brown; bill black; legs and feet black.

Length 12·75; wing 6·90; tail 6·30; culmen 0·90; tarsus 0·75.

The female resembles the male. An immature bird has traces of rufous barring on the lower surface.

Another young bird is described by Shelley as having the entire throat and crop whitish-brown, shaded with rufous and barred with

black, while the rest of the lower surface including the under wing-coverts is white evenly barred with black.

Distribution.—The Black Cuckoo is spread over Africa from the Gold Coast and from Abyssinia southward to Cape Colony. In the south and in the south-east, so far as is known, it is found only during the summer months from October to March, when it breeds. During the rest of the year, it apparently migrates to the west and north-east, as it has been obtained on the Gold Coast in April and May, in equatorial Africa in August, and in Abyssinia by Heuglin in August and September.

Within our limits it is abundant in the eastern portion of the Colony, but is not apparently found to the westward of the Albany division; thence it extends through Natal, Zululand and the Transvaal to German south-west Africa and the Zambesi. The following are recorded localities: Cape Colony—Great Fish, Sunday and Zwartkop rivers (where it was first found by Levaillant), Albany div. Dec. (Ivy), Elandsport (Atmore), King William's Town (Brit. Mus.), Port St. John's, Dec. (S. A. Mus.); Natal—Durban and Newcastle (Brit. Mus.), Echowe (Woodward); Transvaal—Zand river, Nov., Komatipoort, Sept., both in Lydenburg dist. (Francis in S. A. Mus.), Potchefstroom, Jan. (Ayres in S. A. Mus.), Rustenburg district, Nov. (Oates); Bechuanaland—Bamangwato, Nov. (Buckley), Lake Ngami dist. (Andersson); German south-west Africa—Rehoboth, Feb., Dec. (Fleck), Otjimbingue, Dec. (Andersson), Omaruru, Dec. (Eriksson in S. A. Mus.), Elephant Vley, Oct., Nov. (Andersson).

Habits.—This bird derives its name ("le criard" of Levaillant) from its loud three-syllabled note, to which the male gives vent all day long and most of the night from the topmost branch of a lofty tree; it is very shy and wary and if disturbed will dart away very swiftly into a neighbouring thicket. When two birds meet however they greet one another with a peculiar chattering not unlike that of the red-billed Hoopoe. Like other cuckoos its food consists chiefly of caterpillars. Levaillant states that the Black Cuckoo places its eggs in the nest of the Wren warblers (*Prinia maculosa* and *P. hypoxantha*). As the nest of this bird is very small and domed it is a physical impossibility for the cuckoo to lay its egg in the nest, and Levaillant believed that the egg was laid on the ground and carried by the cuckoo in its mouth to the nest selected.

This is borne out by the observations of Mr. Ivy, the only other

naturalist who has observed the nesting habits of this cuckoo. He says: "In December, 1891, I watched one of these birds for several hours, and finally saw her fly into a thornbush close to a picnic party. On going to the bush I found a nest of *Andropadus importunus* containing two eggs with the usual markings of grey and brown, together with a single large white cuckoo's egg slightly incubated, while the others were fresh, I have noticed that both this and the former species (*Cuculus solitarius*) seem to return to the same neighbourhood every year."

Genus II. CHRYSOCOCCYX.

Type.

Chrysococcyx, *Boie, Isis*, 1827, p. 977 *C. cupreus*.

Bill somewhat slender, no crest, wings long and pointed, but the longest (third) primary only exceeding the secondaries by about one-third the total length of the wing; tarsus thickly feathered almost to the toes. Plumage with brilliant metallic colouration. Sexes differing to a considerable extent.

This genus, if the Indian forms be included, as is done by Blanford, is spread over Africa south of the Sahara, southern Asia and the East India Islands as far as Australia and New Zealand. Three out of the four African species are here described.

Key of the Species.

- A. Metallic-green above, unbarred.
- a. Throat green, contrasting with the yellow breast and abdomen *C. smaragdineus* ♂, p. 185.
 - b. Below uniform white or barred, never yellow.
 - a¹. Outer tail-feather white, with narrow dusky-green bars; a patch of green on either side of the chest *C. klaasi* ♂, p. 186.
 - b¹. Outer tail-feather dusky-green, with about five round white spots on both webs, no green on the chest.
 - a². Dusky-bronze bars not crossing the chest..... *C. cupreus* ♂, p. 189.
 - b². Dusky-bronze bars crossing the chest *C. cupreus* ♀, p. 189.
- B. Metallic-green above, barred with rufous.
- a. Head ashy-black.
 - a¹. Below white, barred throughout with green *C. smaragdineus* ♀, p. 185.

- b*¹. Below buffy-white, barred with narrow lines of brown *C. klaasi* ♀, p. 186.
- b*. Head rufous, throat streaked, breast and abdomen barred with dusky-green *C. cupreus juv.*, p. 189.

464. **Chrysococcyx smaragdineus.** *Emerald Cuckoo.*

Cuculus cupreus (*nec Bodd.*), *Vieill. Gal. Ois.* i, p. 33, pl. xlii. (1825); *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 42 (1858) [Knysna].

Chalcites smaragdineus, *Swains. B. W. Afr.* ii, p. 191 (1837); *Layard, B. S. Afr.* p. 251 (1867).

Chrysococcyx smaragdineus, *Gurney, Ibis*, 1859, p. 246 [Natal]; *Butler, Feilden, and Reid, Zool.* 1882, p. 207 [Newcastle]; *Shelley, Cat. B. M.* xix, p. 280 (1891); *id. B. Afr.* i, p. 124 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 410, 499 [Zululand]; *Woodward Bros. Natal B.* p. 117 (1898); *Alexander, Ibis*, 1900, p. 109 [Kafue river]; *Marshall, ibid.* p. 252 [Mashonaland]; *Ivy, Ibis*, 1901, p. 26.

Cuculus smaragdineus, *Sharpe, P. Z. S.* 1873, p. 588; *id. ed. Layard's B. S. Afr.* pp. 151, 809 (1875-84); *Shelley, Ibis*, 1875, p. 83 [Pine-town, Durban].

Metallococcyx smaragdineus, *Reichenow, Ornith. Monatsb.* iv, p. 54 (1896).

"Bantwanyana" of the Zulus (Woodward).

Description. Adult male.—Above, throughout a bright metallic emerald-green, throat and chest the same; four central tail-feathers unspotted, three lateral pairs tipped with white, and the outer pair barred as well; lower breast, abdomen, and thighs canary-yellow; under tail-coverts white, barred with emerald-green; under wing-coverts and inner lining of the quills white.

Iris dark brown; bill blackish at base, olive-green at the tip; legs and feet bluish-slate.

Length in the flesh 8.12; in skin 8.5; wing 4.4; tail 3.80; tarsus 0.70; culmen 0.60.

The female is very different from the male; head ashy-black; back, mantle and wings emerald-green, the feathers regularly barred with rufous; wing-quills and central tail-feathers dusky, with brown metallic reflections, the former barred on both webs with rufous; third pair of tail-feathers white at the tip and along the outer web, the inner web being barred with chestnut and metallic dusky-black, the outer two pairs are white with a subterminal black bar; lower surface white with narrow transverse bars of green; the bars

becoming more widely separated towards the tail-coverts. The colours of the soft parts are the same as in the male.

Length about 7·75; wing 4·25; tail 3·40; tarsus 0·65; culmen 0·60.

Distribution.—The Emerald Cuckoo is found throughout Africa from the Gambia and Abyssinia southwards to the Colony. So far as our present information goes it is a migratory bird, spending the southern summer, from October to March, in south and east Africa, and the rest of the year, April to September, in west and north-east Africa, the movement probably depending on the rains.

In South Africa this bird is found at Knysna not uncommonly, but appears to be somewhat scarce in the eastern province. It is common in many parts of Natal, and has been procured in Rhodesia and the Zambesi valley, but not hitherto in the Transvaal or in the western half of our region.

The following are recorded localities: Cape Colony—Knysna, October to December (Victorin and S. A. Mus.); Albany, Uitenhage (Ivy, only once), Port St. John's, November, January (S. A. Mus.); Natal—Durban and Pinetown (Shelley), Newcastle, October (Reid), Echowe, October to November (Woodward); Rhodesia—Kafue river, January (Alexander), Makombi's country, north-east of Salisbury (Marshall).

Habits.—The Emerald Cuckoo is the rarest and most beautiful of the three Green Cuckoos of South Africa. It is usually found in forest or thick bush, where the male selects for its perch the topmost branch of a tall tree and calls with a loud and clear musical note, and is thus conspicuous and easily shot, while the female is shy and silent, and usually remains concealed. Caterpillars and the winged females of white ants appear to form the greater part of their food, and on the latter they dart like a fly-catcher. Their flight is swift and dipping.

Little is known about the nesting habits of this Cuckoo, but the Woodward's state that two birds shot by them in October and December contained shelled eggs, one of which was white and the other white speckled with purple.

465. *Chrysococcyx klaasi*. *Klaas' Cuckoo*.

- Le Coucou de Klaas, *Levaill. Ois. d'Afr.* v, p. 53, pl. 212 (1806).
Cuculus klaasi, *Steph. Gen. Zool.* ix, p. 128 (1815); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 43 (1858), [Knysna, Oudtshoorn]; *Sharpe, P. Z. S.* 1873, p. 592; *id. ed. Layard's B. S. Afr.* p. 155 (1875); *Shelley, Ibis*, 1875, p. 83 [Durban].

Chrysococcyx klaasi, *Gurney, Ibis*, 1859, p. 247 [Natal]; *Gurney in Andersson's B. Damaraland*, p. 229 (1872); *Shelley, Cat. B. M* xix, p. 283 (1891); *id. B. Afr.* i, p. 124 (1896); *Sharpe, Ibis*, 1897, p. 499 [Zululand]; *Woodward Bros. Natal B.* p. 118 (1899); *Ivy, Ibis*, 1901, p. 28 [Albany].

Chalcites klaasi, *Layard, B. S. Afr.* p. 250 (1867).

"Meitje" of the Colonists.

Description. Adult male.—Above, bright metallic-green with coppery-red reflections; a white patch of feathers above and behind the eye; wing-quills dusky with a white barring on the inner web; four central tail-feathers like the back, six outer feathers white with a subterminal green bar and a series of narrower bars of the same colour chiefly on their inner webs; below, white, the green of the upper surface continued round to form a patch on either side of the breast; sides of the body and under wing-coverts barred with black; the long front thigh-coverts metallic-green.

Iris brown, edge of eyelid pea-green; bill greenish-brown tipped with black; legs and feet dusky greenish-brown.

Length 7·0; wing 4·10; tail 3·0; culmen 0·55; tarsus 0·60.

The female has the head and nape dusky-brown, an indistinct spot over the ear-coverts barred dull white and brown; back, mantle and wings metallic-green barred with pale rufous. Wing-quills dusky spotted with rufous on both webs; the tail as in the male but dusky bronze rather than green; beneath buffy-white, narrowly barred with dark-brown lines, the brown of the sides of the head advancing to form a patch on either side of the neck; thigh-coverts barred green and rufous.

Length 6·75; wing 4·0; tail 3·0.

The young male resembles the female, but has the crown barred with green and rufous like the back, the under-parts are white barred with brownish-bronze.

Distribution.—This Cuckoo has much the same range as the Emerald, extending from the Gambia, upper Nile districts and Abyssinia southwards to Cape Colony. In South Africa it is found only between November and March, and it no doubt retreats northwards during the winter to the warmer and more northerly portions of Africa, as it has been obtained in Abyssinia from May to August, in Niam Niam in March, and at Mombasa and Lamu in July and August. But that not all the birds migrate to South Africa is proved by the fact that it has been recorded from Kilimanjaro in January and the Cameroons in February.

In South Africa Klaas' Cuckoo has a somewhat more extended

range than the Emerald Cuckoo, as it reaches the neighbourhood of Cape Town and has been obtained in Damaraland.

The following are recorded localities : Cape Colony—Cape division, August 30 and November (S. A. Mus.), Knysna, November, and Oudtshoorn, December and February (Victorin), Albany (Ivy), Stockenstrroom (Atmore), Peddie, November (S. A. Mus.), Port St. John's, November (S. A. Mus.) ; Natal—Durban, February (S. A. Mus.), Pinetown, March (Shelley in Bt. Mus.), Echowe and Ulundi (Woodward) ; Transvaal—Komatipoort, October (Francis in S. A. Mus.) ; German south-west Africa—Swakop river, March (Andersson) ; Portuguese east Africa—Tete on Zambesi (Kirk in Bt. Mus.).

Habits.—This Cuckoo was first obtained by Levallant and named by him after his faithful Hottentot servant Klaas ; the usual Dutch name Meitje, on the other hand, is onomatopœic and derived from the bird's note, which differs markedly from that of the next species. Klaas' Cuckoo frequents both bush and thorn lands, and is more active than the Emerald Cuckoo ; it has a dipping flight and feeds on caterpillars and flying insects, on which it darts like a flycatcher.

Victorin found a young cuckoo of this species in the nest of the Cardinal Woodpecker (*Dendropicus cardinalis*), while Mr. Garriock (on the authority of the Woodwards), states that a Weaver bird is usually the host, and that he has shot a cuckoo of this species with a little dark-coloured egg in its mouth. Mr. Fitzsimmons states also on the same authority that he once observed a Klaas' Cuckoo enter the nest of an Amethyst Sun bird and shortly afterwards come out again with an egg in its mouth ; later on revisiting the spot he found a Sun bird feeding a young Klaas' Cuckoo near the nest. He supposes that the cuckoo removed one of the Sun bird's eggs to make room for its own.

Mr. Ivy gives the following account of this bird :—“ This is one of the commonest Cuckoos in the Albany division. On November 9, 1892, I noticed one of these birds flitting about some low bush in the Belmont Valley near Grahamstown, and, contrary to its usually shy nature, perching within a few feet of our heads. We searched the vicinity thoroughly, and found several nests, but could not discover the egg of the Cuckoo, although we were certain it was close by. Later in the evening Mr. Pym, my companion, found a nest of the Malachite Kingfisher (*Corythornis cyanostigma*) in the bank of a stream, just below where the Cuckoo was calling ; it contained six small round eggs of the usual Kingfisher type, and one longer

egg, beautifully transparent, showing the yolk through the shell. On blowing this egg we found that the yolk was of a much deeper shade of orange than that of the Kingfisher."

466. **Chrysococcyx cupreus.** *Didric Cuckoo.*

Cuculus cupreus, *Bodd. Tabl. Pl. Enl.* p. 40 (1783); *Sharpe, P. Z. S.* 1873, p. 591; *Buckley, Ibis*, 1874, p. 367 [Barnangwato]; *Shelley, Ibis*, 1875, p. 83 [near Durban]; *Barratt, Ibis*, 1876, p. 199.

Cuculus auratus, *Gmel. Syst. Nat.* i, p. 421 (1788); *Burchell, Travels*, i, pp. 464, 501 (1822); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 43, (1858) [Oudtshoorn].

Le Coucou didric, *Levaill. Ois. d'Afr.* v, p. 46, pls. 210-211 (1806).

Chrysococcyx auratus, *Gurney, Ibis*, 1859, p. 247 [Natal]; 1868, p. 467 [Potchefstroom].

Chalcites auratus, *Layard, B. S. Afr.* p. 250 (1867); *Gurney, Ibis*, 1868, p. 163.

Chrysococcyx cupreus, *Sharpe, ed. Layard's B. S. Afr.* pp. 153, 809 (1875-84); *Ayres, Ibis*, 1878, p. 407, 1879, p. 297, 1880, p. 262, 1882, p. 245, 1884, p. 224, 1885, p. 343, 1886, p. 291 [Potchefstroom and Umfuli river]; *Oates, Matabeleland*, p. 305 (1881); *Symonds, Ibis*, 1887, p. 328 [Kroonstad]; *Shelley, Cat. B. M.* xix, p. 285 (1891); *id. B. Afr.* i, p. 124 (1896); *Sharpe, Ibis*, 1897, p. 499 [Zululand]; *Woodward Bros. Natal B.* p. 119 (1899); *Alexander, Ibis*, 1900, p. 109 [Zambesi]; *Marshall, ibid.* p. 252 [Mashonaland]; *Haagner, Ibis*, 1901, pp. 16, 18 [Pretoria Dist.]; *Ivy, ibid.* p. 26 [Bloemfontein].

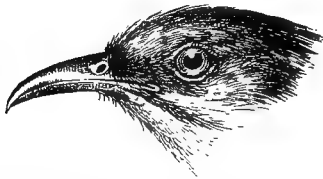


FIG. 63.—*Chrysococcyx cupreus*. $\times \frac{1}{4}$.

Description. *Adult male.*—General colour above metallic-green, with coppery and blue reflections; a streak in the middle of the crown, a spot in front of the eye, and another behind the eye above the ear-coverts, and some of the inner coverts white; primary quills dusky, with white bars on the inner webs, most of the secondaries also, with white spots along both webs; central pair of tail-feathers green and immaculate, lateral pairs with white tips

and spots on either web almost forming bars; wing-coverts, a narrow band under the eye, and malar stripe green; rest of the sides of the head and under surface white, strongly barred on the sides of the body, the under wing-, thigh- and tail-coverts with dull green.

Iris and eyelids red; bill—upper mandible, dark horn, lower light at the base, dark at the tip; legs and feet bluish-black.

Length 7·5; wing 4·40; tail 3·20; culmen 0·60; tarsus 0·70.

The adult female closely resembles the male, but the back is much more coppery and less green; the white crown-marking is absent, or only slightly developed, and the bronze barring of the lower surface is more pronounced, usually reaching right across the chest; the throat and front of the chest are generally shaded with buff; eyelids dusky; iris dull red or tawny.

A young bird has the head uniform rufous, the back is green narrowly barred with rufous, the white on the wings and tail is largely replaced by rufous; below white, the throat and chest streaked, the rest of the lower surface transversely barred with bronzy-green.

Iris light tawny-brown; bill yellow or orange-red, becoming darker.

Distribution.—The Didric is, generally speaking, the most abundant and widely distributed of the Golden Cuckoos; it is found all over the Ethiopian region, from the Gambia river and Abyssinia southward to Cape Colony. Like the other species of the genus this bird is found in South Africa only in the summer from October to May, and appears to migrate during our winter to the upper Nile Valley and Abyssinia, and perhaps to west Africa, but as it has been obtained in the Cameroons in February and in the Fantee country in December, this rule does not appear to be absolute. South of the Zambesi the Didric appears to be found everywhere, except in Great Namaqualand, though less abundantly in Rhodesia than elsewhere.

The following are the principal recorded localities: Cape Colony—Namaqualand (Anderson), Carnarvon and Beaufort West (S. A. Mus.), Colesberg (Layard), Griqualand West, November, December (Burchell), Oudtshoorn, December, January (Victorin), Knysna, December (Bt. Mus.), Albany (Ivy), Peddie (S. A. Mus.), Port St. John's, November (S. A. Mus.); Natal—Upper portion (Ayres), Echowe and Black Umfolosi river (Woodward); Orange River Colony—Bloemfontein, December (Ivy), Kroonstad, October, March (Symonds); Transvaal—Komatipoort, October (Francis in

S. A. Mus.), Pretoria dist. October (Haagner), Potchefstroom, October, March (Ayres), Rustenburg dist. November (Oates and Barratt); Bechuanaland — Bamangwato, November (Buckley); Rhodesia—Umfuli river, October (Ayres); German south-west Africa—Otniorapa, Ovampoland, January (Andersson); Portuguese east Africa—Chicowa on the Zambesi, October (Alexander).

Habits.—The Didric, so-called by Levaillant from its note, is found in thorn country as well as in forest, and is widely spread over the greater part of South Africa. It has a loud and somewhat plaintive note, heard both by day and night; the male calls from its conspicuous perch on a bare tree branch, or even on the wing, while the female remains silent as a rule. Insects of various kinds, especially caterpillars, form the bulk of its nourishment; but Ayres states that on one occasion he found the egg of a sparrow partially digested in the stomach of an individual killed by him; a possible explanation of this may be that the egg really belonged to the Cuckoo itself, and had been swallowed accidentally while being conveyed in its mouth.

Levaillant first studied the nesting habits of this Cuckoo, and took no less than eighty-three eggs from the nests of various insectivorous birds, and as he found many of these in small and covered-in nests in which it would be impossible for the Cuckoo to deposit her egg in the usual manner, he believed that the egg was laid in a convenient spot and conveyed to the nest in the mouth of the parent; moreover, he shot two females actually in the act of so doing, with eggs in their throats. He further states that the eggs are white. Mr. Ayres, on the other hand, states that the eggs are spotted, and that he is certain of this as he took a spotted egg from the ovary of a female, and that the most usual host is the South African Sparrow (*Passer arcuatus*), the eggs of which are also, as a rule, spotted.

Mr. Millar tells me that he believes the egg is blue spotted, like that of a sparrow, and that on two occasions he found what he believed to be eggs of this bird in the nest of a Yellow Weaver bird (*Hyphantornis subaureus*), at Willowgrange and Nottingham Road, in Natal; close by, in another nest of the same species, was a young Didric, which had, like the English Cuckoo, ejected his foster brethren.

Mrs. Barber, Messrs. Jackson and Ivy all state that the egg of this Cuckoo is white and unspotted, while Mr. Fitzsimmons took a verditer-blue egg from the oviduct of a female; it seems, therefore, probable that the colour and markings of the egg vary possibly

in accordance with eggs of the host, as has been proved to be, to a certain extent, the case with the European Cuckoo.

In addition to the Sparrow the Cape Bunting (*Fringillaria capensis*), the Masked Weaver Bird (*Hyphantornis velatus*), the Spotted-backed Weaver (*Hyphantornis spilonotus*), and the Tit-babbler (*Parisoma cœruleum*), have all been noticed as acting as host to this Cuckoo.

There are three eggs in the South African Museum said to belong to this species; they were taken by Messrs. Jackson and Ortlepp from the nests of *Hyphantornis velatus* at Nelspoort and Colesberg respectively; they are smooth, white and somewhat pointed at either end and measure 0.87×0.62 .

Genus III. COCCYSTES.

Type.

Coccytes, *Gloger, Handl. Naturg.* p. 203 (1842)..... *C. glandarius*.

Bill compressed, culmen curved towards the tip; nostrils a linear oval much more elongated than in *Cuculus*; head crested; wing shorter than in *Cuculus*, the difference between the tips of the primaries and secondaries being from a quarter to a third the length of the whole wing; tail longer than the wing and very strongly graduated; only the basal portion of the tarsus feathered. Sexes alike, no distinct plumage to the young.

Eight species have been described, spread over southern Europe, Asia, and the whole of Africa; five of these reach our limits and all are migratory and parasitic in habits.

Key of the Species.

- | | |
|-----------------------------------------------------------------------|----------------------------------|
| A. Black slaty-brown; wing-coverts spotted ... | <i>C. glandarius</i> , p. 193. |
| B. Back glossy black, wing-coverts unspotted. | |
| a. Below, white or gray. | |
| a'. Smaller, wing 5.80, no black streaks on the throat | <i>C. jacobinus</i> , p. 195. |
| b'. Larger wing, 6.0, slightly streaked on the throat | <i>C. hypopinarius</i> , p. 197. |
| c'. Largest, wing 7.0, throat very strongly streaked with black | <i>C. cafer</i> , p. 198. |
| b. Below, glossy black like the back | <i>C. serratus</i> , p. 199. |

467. *Coccytes glandarius*. Great Spotted Cuckoo.

Cuculus glandarius, *Linn. Syst. Nat.* 12th ed. i, p. 169 (1766).

Oxylophus glandarius, *P. L. Sclater, P. Z. S.* 1866, p. 22 [Cathcart];
Layard's B. S. Afr. p. 251 (1867).

Coccytes glandarius, *Gurney in Andersson's B. Damaraland*, p. 225 (1872); *Sharpe, P. Z. S.* 1873, p. 593; *Dresser, B. Eur.* v, p. 219, pl. 300 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 157, 810 (1875-84); *Ayres, Ibis*, 1879, p. 298 [Potchefstroom]; *Butler, Feilden, and Reid, Zool.* 1882, p. 207 [Blaauwkrantz river]; *Ayres, Ibis*, 1886, p. 291; *Symonds, Ibis*, 1887, p. 329 [Kroonstad]; *Shelley, Cat. B. M.* xix, p. 212 (1891); *id. B. Afr.* i, p. 123 (1896); *Marshall, Ibis*, 1896, p. 242 [Salisbury]; *Woodward Bros. Natal B.* p. 113 (1899); *Marshall, Ibis*, 1900, p. 251; *Ivy, Ibis*, 1901, p. 22 [Albany div.].

Description. *Adult male.*—Crown, which is crested, grey with black shaft lines to the feathers, rest of the upper surface including the wings and tail slaty-brown, the scapulars, secondaries, wing-

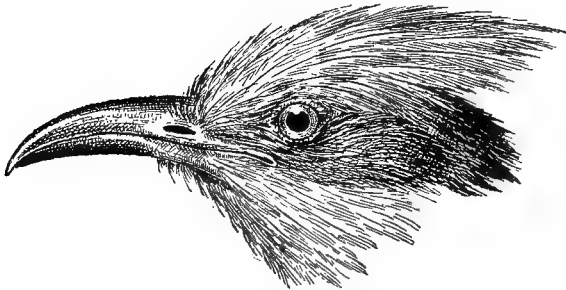


FIG. 64.—*Coccytes glandarius*. $\times \frac{1}{4}$.

coverts and tail-quills tipped with white, the latter more strongly towards the outermost; ear-coverts and feathers round the eye grey, like the crown; throat and upper breast pale ochreous-yellow, this colour extending on to the sides of the neck so as to form a half collar, all the rest of the lower surface white; under wing-coverts tinged with ochreous.

Iris brownish-hazel; bill brown, yellow at base of lower mandible; legs and feet bluish-brown.

Length about 14.75; wing 7.75; tail 8.25; culmen 1.0; tarsus 1.25.

The female is eventually like the male but appears to take longer to assume the adult plumage. The young bird has a com-

pletely black crown ; the greater portion of the wing-quills chestnut and a much darker ochreous chest and collar.

Distribution.—The Great Spotted Cuckoo is a migratory bird, spending the northern summer and breeding in southern Spain, north Africa and western Asia as far as Persia, while it has occasionally wandered to England and other parts of northern Europe. During the northern winter it is spread all over Africa south of the Sahara. Within our limits it appears to be somewhat local and rare, though it is recorded from most districts of our area, except the western half of the Cape Colony ; it arrives usually in October and leaves in March, and has been found breeding in December by Ivy.

The following are recorded localities : Cape Colony—Port Elizabeth (Bt. Mus.), Albany div. December, February (Ivy), Cathcart (Boulger), King Williams Town (Trevelyan) ; Natal—Blaauwkrantz river, near Colenso (Reid in November, Garriock in March) ; Orange River Colony—Bloemfontein, January (Bt. Mus.), Kroonstad, November to January (Symonds) ; Transvaal—Lydenburg dist. January (Francis in S. A. Mus.), Potchefstroom, January and February (Ayres), Rustenburg (Barratt in Bt. Mus.) ; Rhodesia—Salisbury, November (Marshall) ; German south-west Africa—Otjimbingue, December to March, Ondonga November, and Okavango river (Andersson).

Habits.—The Great Spotted Cuckoo seems to be fairly plentiful near Salisbury and at Kroonstad ; at the former place it arrives at the end of September and is seen about singly or in pairs ; it has a harsh chatting scolding cry, and the males are often seen chasing one another in early summer ; they are very cunning birds and hide in the middle of a thick tree, slipping out quietly on the opposite side to that by which they are approached. Their food consists of insects such as locusts, beetles, and hairy caterpillars ; the urticating hairs of these latter are got rid of by running the larvæ from side to side through the bill before they are swallowed.

Mr. Ivy gives the following account of their breeding in South Africa : “ Mr. B. Campbell, of Rocklands, Fish River, brought home in December two eggs of this bird. They were of a pale dull blue with small blackish spots ; they had been found in the nest of a Black Crow (*Corvus capensis*) along with three of the typical pink-cream eggs of that bird.

“ In the same month of the same year I found a nest of the Red-winged Starling (*Amydrus morio*) placed on a ledge on the

face of a krantz, twelve feet from the ground. The nest, which was cup-shaped and made of fibres and roots supported on a mud base, contained a young Great Spotted Cuckoo. I kept this bird in a large well-lighted room, feeding it on larvæ and chopped meat. It developed its feathers and began to fly about two weeks after I found it. It resembled the adult bird; except that the grey of the back was much darker and the buff of the chest more intense. The bird became very tame, flying to my shoulder on my calling to it, and often taking journeys outside my room.

“In April it became very restless, dashing against the walls and windows, and finally died about the middle of the month.

“I have seen a pair of old birds of this species with five young all flying together late in February. I believe that the old birds collect their broods previous to migrating.”

In Spain the Magpie (*Pica rustica*) is usually selected as foster parent; in Somaliland Mr. Lort Philips found eight eggs of this parasitical bird in the same nest as four of a crow (*Corvus affinis*). The cuckoo takes the egg in her bill and after placing it in the nest often ejects an egg of the foster parent to make room for her own. The egg is pale green streaked and spotted with russet and dull lilac, measuring 1.2×0.96 .

Judging from these observations of Mr. Ivy we must conclude that the Great Spotted Cuckoo, like the Bee-Eater (*Merops apiaster*), either breeds twice a year in its northern and southern homes respectively, or that the South African birds only migrate to us during the summer and pass our southern winter somewhere in central Africa.

468. *Coccytes jacobinus*. *Black and White Cuckoo*.

Cuculus jacobinus, *Bodd. Tabl. Pl. Enl.* p. 53 (1783).

Cuculus melanoleucos, *Gmel. Syst. Nat.* i, p. 416 (1788).

Le Coucou Edolie femelle, *Levaill. Ois. d'Afr.* v, p. 39, pl. 208 (1806).

Oxylophus melanoleucus, *Layard, B. S. Afr.* p. 253 (1867) (part); *Ayres, Ibis*, 1871, p. 261 [Potchefstroom].

Oxylophus jacobinus, *Gurney in Andersson's B. Damaraland*, p. 225 (1872).

Coccytes jacobinus, *Sharpe, P. Z. S.* 1873, p. 597; *Buckley, Ibis*, 1874, p. 367 [Limpopo]; *Sharpe, ed. Layard's B. S. Afr.* pp. 153, 810 (1875-84) (part); *Shelley, Ibis*, 1882, p. 246 [Bamangwato]; *Holub & Pelz. Orn. Süd-Afr.* p. 165 (1882); *Butler, Feilden, and Reid, Zool.* 1882, p. 207; *Symonds, Ibis*, 1887, p. 329 [Kroonstad];

Shelley, Cat. B. M. xix, p. 217 (1891); *Shelley, B. Afr.* i, p. 123 (1896); *Woodward Bros. Natal B.* p. 113 (1899); *Alexander, Ibis*, 1900, p. 108 [Zumbo]; *Marshall, Ibis*, 1900, p. 251 [Mashonaland].

Description. Adult male.—Above, black glossed with green; a white band across the wing, caused by the basal halves of the primary quills being white; central tail-feathers slightly, outer more strongly, tipped with white; below, white washed with pale buff, outer under wing-coverts like the rest of the under surface, inner ones slaty-black.

Iris dusky or black; bill black; legs and feet lead coloured or black.

Length 13·5; wing 5·80; tail 6·70; culmen 0·90; tarsus 1·1.

The female resembles the male in plumage and size. The young bird is brown above, and the bases of the primaries and tips of the tail are fulvescent; the throat is grey and the rest of the underparts buff.

Distribution.—The Black and White Cuckoo is a widely-spread bird, ranging all over Africa, south of Sahara and through southern Asia as far as Assam and Upper Burma.

In South Africa it appears to be replaced in the Colony by the following sub-species; elsewhere it is widely spread, though never very common, and only found in the summer from October to February. It probably spends the southern winter in central Africa.

The following are localities: Natal—Near Colenso in November (Butler), Maritzburg (Fitzsimmons); Orange River Colony—Kroonstad (Symonds), Bloemfontein, October (S. A. Mus.); Transvaal—Potchefstroom (Ayres); Bechuanaland—Mangwato, December (Ayres), Lake Ngami dist. (Andersson); Rhodesia—near Salisbury, February (Marshall); German south-west Africa—Damaraland, December (Andersson); Portuguese east Africa—Tete (Livingstone), Zumbo, November (Alexander).

Habits.—Mr. A. D. Millar writes:—"The Black and White Cuckoo is not often seen on the coast, but is frequently met with among the thorns of the upper districts of Natal during the summer months. During the latter half of December, 1898, when nesting near Frere, between Estcourt and Ladysmith, I found on three occasions eggs of this bird deposited in the nest of the Fiscal Shrike (*Lanius collaris*). In two instances the nest contained the full clutch of the shrike, in addition to the Cuckoo's egg, but in the other case only two shrike's eggs. The cuckoo's egg is large, white and somewhat ovate, measuring 1·0 by 0·85.

469. *Coccytes hypopinarius*. *Black and Grey Cuckoo*.

Coccytes hypopinarius, *Cab. & Heine, Mus. Hein.* iv, p. 47 (1862); *Norman, Ibis*, 1888, p. 406; *Shelley, Cat. B. M.* xix, p. 220, pl. 11, fig. 2 (1891); *id. B. Afr.* i, p. 123; *Rendall, Ibis*, 1896, p. 168 (1896) [Barberton]; *Alexander, Ibis*, 1900, p. 108 [Zumbo].

Coccytes jacobinus (*nec Bodd.*), *Layard, B. S. Afr.* p. 253 (1867) (in part); *Ayres, Ibis*, 1876, p. 432, 1877, p. 342; *Sharpe, ed. Layard's B. S. Afr.* p. 158 (1875) (in part); *Ivy, Ibis*, 1901, p. 23.

Description. *Adult.*—Closely resembling *C. jacobinus* but with the under parts a slaty-grey throughout, the sides of the neck and chest being slightly streaked and suffused with black.

Iris black; bill, legs and feet black.

Length about 13·75; wing 6·0; tail 7·20; culmen 0·85; tarsus 1·0.

The female resembles the male.

Distribution.—This species appears to replace the true *C. jacobinus* in the Cape Colony and Natal, while other examples appear to have been obtained in the Transvaal, the Zambesi valley and Nyasaland, where the typical form also exists. As, however, the differences between the two species have not been long noticed it is difficult to accurately discriminate their distribution.

The following localities are recorded: Cape Colony—Cape div. January, Stellenbosch, October, and Robertson, December (S. A. Mus.), Albany (S. A. Mus. and Ivy), Eland's Post (Bt. Mus.), near Aliwal North, January (Whitehead); Natal—Durban (Bt. Mus.); Transvaal—Barberton, November (Rendall), Pretoria and Potchefstroom (Bt. Mus.); Portuguese east Africa—Zumbo, November (Alexander)

Habits.—The Black and Grey Cuckoo usually appears with the first rains in September or October; it has a loud whistle-like call note specially heard after rain; its food appears to consist chiefly of hairy caterpillars.

Col. Bowker stated to Layard that he believed he had found the eggs of this bird in the nest of the Drongo (*Dicrurus afer*) and also in that of a Woodpecker, and further that the true parent watched the foster parents to see that they did their duty by the young cuckoos.

Mr. Ivy gives the following notes: "This bird was seen by Mr. Pym to leave the nest of a Bulbul (*Pycnonotus tricolor*) in the Belmont valley near Grahamstown. On examination the nest was found to contain one Cuckoo's egg (white) and two of the Bulbul's (spotted with pinky-red). In November, 1894, I found a nest of

Andropadus importunus containing two of the usual eggs (white with brown and purple marbling) in addition to five large Cuckoo's eggs. These all together more than filled the small cup-shaped nest, the rightful occupants of which were flitting about in an excited state. Close by three Cuckoos (*Coccytes jacobinus*, *Coccytes serratus*, and *Cuculus clamosus*) were observed, and from the different sizes and shapes of the eggs I believe that all these three cuckoos had utilised the one tiny nest.

On another occasion I found an egg of this bird in the nest of *Campophaga hartlaubi*, together with a young bird belonging to the host. The egg turned out to be addled; but that it did belong to this Cuckoo was evidenced by the fact that a *Coccytes jacobinus* had been seen to visit the nest.

470. **Coccytes cafer.** *Levaillant's Cuckoo.*

Cuculus cafer, *Licht. Cat. rer. nat. Hamb.* p. 14 (1793).

Variété du Coucou Edolio, *Levaill. Ois. d'Afr.* v, p. 44, pl. 209 (1806).

Cuculus afer, *Leach, Zool. Misc.* i, p. 72, pl. 31 (1814).

Oxylophus afer, *Layard, B. S. Afr.* p. 253 (1867).

Oxylophus caffer, *Gurney in Andersson's B. Damaraland*, p. 225 (1872).

Coccytes cafer, *Sharpe, ed Layard's B. S. Afr.* pp. 158, 810 (1875-84); *Oates, Matabeleland*, p. 305 (1881); *Ayres, Ibis*, 1884, p. 224 [Rustenburg]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 165 (1882); *Norman, Ibis*, 1888, p. 407; *Shelley, Cat. B. M.* xix, p. 221 (1891); *id. B. Afr.* i, p. 123 (1896); *Sharpe, Ibis*, 1897, p. 499 [Zululand]; *Woodward Bros. Natal B.* p. 114 (1899); *Alexander, Ibis*, 1900, p. 108 [Zumbo]; *Marshall, ibid.* p. 252 [Mashonaland].

"Inkanku" of Natal Zulus (Woodward).

Description. *Adult male.*—Above, black with a violet and green gloss on most of the feathers; a white band on the wing caused by the basal half of the primaries being white; tail-feathers tipped with white, more broadly on the outer feathers; under surface white, the throat and chest very strongly streaked with black, sides of the body and thighs with a few inconspicuous black streaks; outer under wing-coverts streaked like the breast, inner ones slaty-black.

Iris dark hazel; bill black; legs and feet dark ashy.

Length 14.75; wing 7.0; tail 8.75; culmen 1.1; tarsus 1.25.

The female is like the male, but somewhat smaller; wing 6.75.

The young bird is brown above; only the two outer tail-feathers

have white tips; the under surface is washed with brown on the throat and thighs, and the dark centres to the tail-feathers are but irregularly indicated.

Distribution.—Levaillant's Cuckoo appears to be found throughout the Ethiopian region, from the Gambia and Abyssinia southwards. In South Africa it occurs as a rule only in the summer months, from October to March, but in Nyasaland in both January and June; again in Abyssinia it was met with by Blanford in July, and was obviously breeding; it is probably a partial migrant.

It has only once been recorded from the Colony where it is obviously very rare, but seems to be pretty common in Natal, the Transvaal, and other parts of South Africa, as shown by the following list of localities:—Cape Colony—Swellendam (Layard); Natal—Weenen, March (Bt. Mus.), Klip river district and Umfolosi valley (Woodward); Transvaal—Lydenburg district, April (Francis in S. A. Mus.), June (Bt. Mus.), Rustenburg, November, January, February (Ayres); Bechuanaland—Kanye (Exton); Rhodesia—Tati, October (Oates), Pandamatenka, January (Holub), Salisbury, December (Marshall); German south-west Africa—Otjimbingue, November (Andersson), Omaruru, February (Eriksson), Okavango, September (Andersson); Portuguese east Africa—Zumbo, November (Alexander).

Habits.—Levaillant's Cuckoo seems nowhere a very plentiful bird, it appears in spring in November just before the rains; it is usually seen in pairs and is shy and retiring. The Woodward found it partial to the bushy banks of streams and rivers, where its loud cry is often heard, which, like that of the English Cuckoo, is supposed to indicate the time for sowing and planting the crops among the Zulus of Natal. It feeds on cockroaches, worms, and termites, and appears to be specially fond of large, hairy caterpillars; it is sometimes mobbed by small birds. Nothing is known of its breeding habits in South Africa.

471. *Coccytes serratus.* *Black-crested Cuckoo.*

Cuculus serratus, *Sparman, Mus. Carls.* i, pl. 111 (1789); *Grill, K.*

Vet. Akad. Handl. Stockh. ii, no. 10, p. 43 (1858).

Le Coucou Edolio mâle, *Levaill. Ois. d'Afr.* v, p. 39, pl. 207 (1806).

Cuculus edolius, *Cuv. Règne Anim.* i, p. 425 (1817).

Oxylophus serratus, *Ayres, Ibis*, 1859, p. 246 [Natal]; *id. Ibis*, 1869, p. 297 [Potchefstroom]; *Pelzeln, Novara Reise, Vögel*, p. 103 (1869) [Cape division].

Oxylophus edolius, *Layard, B. S. Afr. p. 252 (1867)*.
Coccystes serratus, *Sharpe, P. Z. S. 1873, p. 599*; *Sharpe, ed. Layard's B. S. Afr. pp. 160, 810 (1875-84)*; *Layard, P. Z. S. 1873, p. 599*; *Ayres, Ibis, 1878, p. 408, 1885, p. 344 [Potchefstroom]*; *Norman, Ibis, 1888, p. 409*; *Shelley, Cat. B. M. xix, p. 223 (1891)*; *Shelley, B. Afr. i, p. 123 (1896)*; *Woodward Bros. Natal B. p. 114 (1899)*; *Ivy, Ibis, 1901, p. 24 [Albany]*.
 "Nieuwjaarsvogel" of Dutch.

Description. *Adult male*.—Above and below throughout, black glossed with green, a white band on the wing formed by the white basal halves of the primary quills.

Iris, bill, and legs black.

The female is like the male in plumage and size.

Distribution.—This Cuckoo has hitherto been found only in Cape Colony and Natal, extending northwards as far as Potchefstroom; it occurs within our limits only during the summer months between October and March, and its winter quarters are at present unknown. A closely allied species (*C. albonotatus*) has been described from German east Africa.

The following are recorded localities: Cape Colony—Cape division, October, November, December (S. A. Mus. and Victorin), Stellenbosch, December (S. A. Mus.), Oudtshoorn, December (Victorin), Nelspoort (Layard), Albany, December, February (Ivy and Bt. Mus.), near Aliwal North, December (Whitehead), Eland's Post (Bt. Mus.), King Williams Town (Bt. Mus.), Peddie (S. A. Mus.) Port St. John's, November (S. A. Mus.); Natal—Durban and Weenen (Bt. Mus.); Transvaal—Potchefstroom, November to February (Ayres).

Habits.—The Black-crested Cuckoo is always a migratory bird in South Africa, arriving almost invariably in October and leaving in March; it is found usually in pairs about the trees, along rivers, or in thick bush, where it searches for its insect food, which consists of beetles, maggots, flies and termites; it is specially fond of hairy caterpillars, and the gizzard of a specimen was found by Ayres to be entirely lined with a felt of hairs, which was quite free from the true gizzard wall and almost certainly consisted of caterpillar's hair.

An example shot in Cape Town in November, 1884, was found by Mr. Trimmen to have the stomach crammed with the larvæ of a large Bombycine moth, *Metanestria pithyocampa*; these, in addition to being exceedingly hairy, have dorsal clusters of sharp and acicular spines, which must be rather difficult of digestion. The call, a loud one, is often heard during the night. The eggs are laid

in the nests of various birds; Mr. Atmore found that the Geelgat (*Pycnonotus capensis*) was usually the host. A young fledged cuckoo of this species was brought to the South African Museum on January 21, which had been seen on one occasion in a Geelgat's nest, and which had been subsequently found on the ground below the nest. Colonel Bowker took the eggs and young from the nests of *Tarsiger silens*. Finally, Mr. Ivy saw one of these birds leave the nest of a Mouse bird (*Colius erythromelon*). The nest contained three eggs of the host (white with a few pinky scratches), together with one egg of the Cuckoo. Eggs in the South African Museum obtained by Layard at Nelsport measure 1.05×0.85 .

Subfamily II. CENTROPODINÆ.

Wings short and rounded fitting to the sides of the body; distance between the tips of the primaries and secondaries less than the length of the tarsus or culmen; tarsus bare of feathers and strong; tail generally long, graduated and broad.

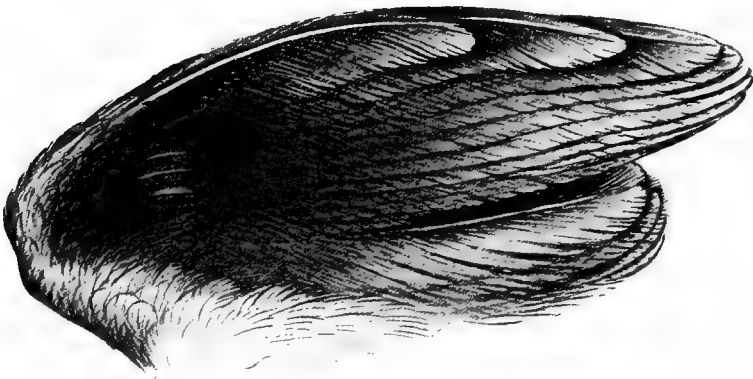


FIG. 65.—Wing of *Centropus burchelli*.

Anatomically this subfamily differs from the *Cuculinae* in possessing a femoro-caudal muscle and in the division of the pectoral tract of feathers on either side into two branches which terminate separately.

All the birds of this subfamily are non-parasitic, building their own nests and hatching their own eggs.

Genus I. **CENTROPUS.***Type.***Centropus**, *Illiger, Prodr.* p. 205 (1811).....*C. senegalensis.*

Bill deep and strong; nostril somewhat linear, partially closed by membrane; shafts of the feathers of the head, mantle and breast stiffened and bristle-like; wing very short and rounded, the primaries hardly exceeding the secondaries in length; tail long,

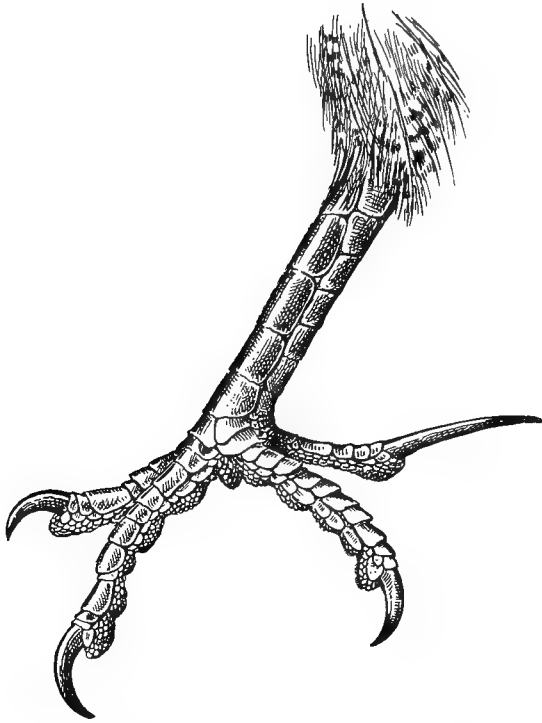


FIG. 66.—Foot of *Centropus burchelli*. $\times \frac{1}{2}$.

broad and graduated; tarsus strong and naked; claws somewhat strong and straight, that of the hind toe or hallux nearly twice as long as the others and straight like that of a lark. Sexes alike.

This is a large genus containing more than thirty species which are spread over the whole of Africa south of the Sahara, Egypt,

Madagascar, and southern Asia as far as the Papuan Islands and Australia.

Six species, all residents, are found in South Africa.

Key of the Species.

- A. Under parts buff or white, not black.
- a*¹. Larger, wing 7·8 to 8·9; gloss on the crown with a lilac shade; tail bronzy-black with little green gloss *C. cupreicauda*, p. 207.
- b*¹. Smaller, crown not glossed with lilac-blue.
- a*². No white tips to the tail-feathers; adults with no bars on the upper tail-coverts or tail-feathers.
- a*³. No white feathers in front of the eye. *C. senegalensis*, p. 206.
- b*². A few white feathers in front of the eye *C. flecki*, p. 207.
- b*². Tail with white tips.
- a*³. Crown blackish, nape with sometimes a few white shaft stripes, with or without a few white feathers in front of the eye..... *C. burchelli*, p. 203.
- b*³. Crown brown, nape with numerous white shaft lines, and marked buff eyebrows..... *C. superciliosus*, p. 208.
- B. Under parts black throughout *C. nigrorufus*, p. 209.

472. **Centropus burchelli.** *Burchell's Coucal.*

Le Coucal houhou, *Levaill. Ois. d'Afr.* v, p. 72, pl. 219 (1806).

Centropus burchelli, *Swains. An. in Menag.* p. 321 (1838); *Layard, B. S. Afr.* p. 246 (1867); *Bryden, Gun and Camera*, p. 408 (1893); [Botletli river]; *Sharpe, Ibis*, 1900, p. 114 [Beira dist.]; *Marshall, Ibis*, 1900, p. 252 [Mashonaland].

Centropus senegalensis (*nec Linn.*), *Ayres, Ibis*, 1871, p. 261 [Limpopo]; *Sharpe, P. Z. S.* 1873, p. 617 (in part); *Sharpe, ed. Layard's B. S. Afr.* pp. 162, 810 (1875-84); *Oates, Matabeleland*, p. 305 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 163 (1882); *Ayres, Ibis*, 1884, p. 225 [Potchefstroom]; *Woodward Bros. Natal B.* p. 120 (1899).

Centropus natalensis, *Shelley, Ibis*, 1882, p. 246; *W. Ayres, Ibis*, 1887 p. 52 [Zoutspansberg]; *Shelley, Cat. B. M.* xix, p. 362 (1891); *id. B. Afr.* i, p. 123 (1896); *Rendall, Ibis*, 1896, p. 168 [de Kaap]; *W. L. Sclater, Ibis*, 1899, p. 286 [Inhambane]; *Alexander, Ibis*, 1900, p. 106 [Tete]; *Ivy, Ibis*, 1901, p. 28, fig. 3 [Albany].

"Vlei Lourie," of the Colonists; "Ufukwe" of Zulus (Woodward), whence "Fouqua" of Natal Colonists.

Description. *Adult.*—Crown, sides of the head and nape blue-black with shiny shafts to the feathers; middle of the back and wings rufous-brown, the primaries, except at their tips, rather more rufous, sometimes a few white shafts to the scapulars; rump and upper tail-coverts mottled and barred, dark green and dull white; tail-feathers uniform dark green, except below the coverts where they are barred with rufous, and narrowly tipped with white; below, and under tail-coverts buffy-white throughout, the thigh and under tail-coverts sometimes showing traces of black bars, the shafts of the feathers being shiny throughout.

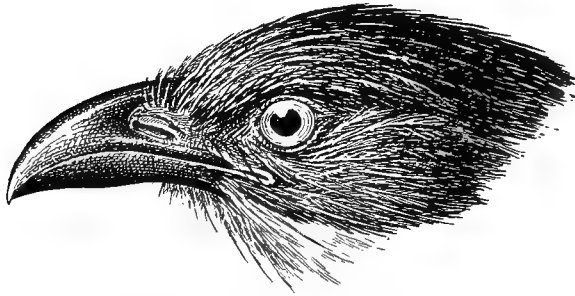


FIG. 67.—Head of *Centropus burchelli*. $\times \frac{1}{2}$.

Iris red; bill black; legs and feet leaden-black.

Length about 16.5; wing 6.4; tail 9.85; culmen 1.3; tarsus 1.6.

The sexes are alike; a young female has the crown dull black with a few red shaft marks; an obscure lighter eyebrow, the back and wings rufous, mottled and banded with black; the tail-feathers are clearly barred with narrow bands of pale rufous for about half their length; the throat is washed with pale rufous and the thighs and sides of the body are barred with black.

Distribution.—Burchell's Coucal is a widely-spread resident over the greater part of South Africa, and appears to be confined or almost confined to it, if, as is generally now considered to be the case, it is distinct from the West African *C. senegalensis*. It is common through Cape Colony from Swellendam eastwards, Natal, the Transvaal and Mashonaland and has been obtained in Nyasaland.

The following are the principal localities: Cape Colony—Swellendam, Caledon, Peddie (S. A. Museum), Knysna (Marais),



FIG. 68.—Nest and eggs of *Centropus burchelli*, from a photograph by Mr. Ivy, taken near Grahamstown (*Ibis*, 1901).

Albany (Ivy), Herbert (Miss Orpen in S. A. Mus.), Port St. John's (S. A. Mus.); Natal—near Durban (S. A. Mus.); Transvaal—Potchefstroom, Rustenburg (Ayres), Zoutspansberg (W. Ayres); Bechuanaland—Lake Ngami (Andersson), Botletli river (Bryden); Rhodesia—Tati (Oates), Pandamatenka (Holub), Mashonaland (Marshall); Portuguese east Africa—Tete on the Zambesi (Alexander), Inhambane (Francis), and Beira (Cavendish).

Habits.—The Vlei Lourie is almost invariably found about the thickets and impenetrable bush along rivers and the banks of vleis; it is usually to be seen in pairs, and is a shy skulking bird, more often heard than seen. Most of its time is spent on the ground creeping about among the reeds and bush; here it effectually conceals itself so that it is a difficult matter to put it up; moreover, its flight is very weak and laboured, and never extends for more than 100 yards or so at the outside.

The note is loud and somewhat melancholy, something like the syllable “ku-ku” or “tu-tu” repeated rapidly many times, beginning in a high key and falling to a low one; it is to be heard in early morning and late afternoon, and even not infrequently during the night. The Kaffirs say it calls before rain. Locusts, caterpillars and other large insects form the greater part of this bird's nourishment, while Ayres found in the stomach of one examined by him a lizard's tail and many crab-shells.

Like other Coucals this bird builds its own nest and hatches its young; the nest is composed of dry grass or leaves and is placed low down in a thick mass of creeper or bush; it is globular and domed with a side entrance said to face away from the prevailing winds, and is lined with dried mud according to Col. Bowker. The eggs which are four or five in number are large, rounded and pure white in colour.

Young birds found by Mr. Darling near Mazoe in Mashonaland in January were very extraordinary looking little creatures, with large heads and enormously distended abdomens, and one which was skinned was found to have no less than seventeen grasshoppers besides *débris* of other insects in its stomach.

473. *Centropus senegalensis*. *Senegal Coucal*.

Cuculus senegalensis, *Linn. Syst. Nat.* i, p. 169 (1766).

Centropus senegalensis, *Buckley, Ibis*, 1874, p. 366 [Bamangwato];

Shelley, Cat. B. M. xix, p. 360 (1891).

Centropus fasciopygialis, *Reichenow, Orn. Monatsb.* vi, p. 23 (1898).

Description. *Adult.*—Upper half of head, back of neck, rump, upper tail-coverts and tail brownish-black strongly glossed with green; tail-feathers without white tips; wing bright chestnut; beneath white tinged with buff.

Iris red; bill and legs black.

Length 16·5; wing 6·6; tail 8·5; culmen 1·2; tarsus 1·6.

The young bird differs in having blackish bars on the mantle and wings, and generally traces of buff bars on the upper tail-coverts and tail.

Distribution.—Throughout almost the whole of tropical Africa; within our limits has been once obtained at Bamangwato in Bechuanaland by Buckley.

474. *Centropus flecki.* *Fleck's Coucal.*

Centropus flecki, *Reichenow, Ornith. Monatsb.* i, p. 84 (1893); *Fleck, Journ. Ornith.* 1894, p. 397, pl. iv.

Description. *Adult.*—Resembling *C. senegalensis* in every respect but with a few white feathers in front of the eye.

A young bird has the upper half of head and back of the neck dull brown; bill yellowish with culmen dark brown; wings, upper tail-coverts and tail barred.

Length 16·5; wing 6·7; tail 8·5.

Distribution.—This bird was obtained at Nocana on the Okavango, not far from Lake Ngami, by Dr. Edward Fleck.

475. *Centropus cupreicauda.* *Bronzy-tailed Coucal.*

Centropus cupreicaudus, *Reichenow, Ornith. Monatsb.* iv, p. 53 (1896).
Centropus monachus, *Shelley, Cat. B. M.* xix, p. 359 (1891) (in part specs. p. to w.)

Description.—Larger than *C. senegalensis*; crown of the head glossed with blue with a lilac shade; tail bronzy-black with very little green gloss.

Wing 7·8 to 8·9; tail 8·0 to 10·0.

Distribution.—The type of this species was obtained in Damara-land whence the bird ranges to Benguela the Upper Zambesi valley and Lake Ngami.

476. **Centropus superciliosus.** *White-browed Coucal.*

Centropus superciliosus, *Hempr. & Ehren. Symb. Phys. Aves*, p. "s" (1833); *Gurney, Ibis*, 1859, p. 247 [Natal]; *Layard, B. S. Afr.* p. 246 (1867); *Sharpe, P. Z. S.* 1873, p. 620; *Buckley, Ibis*, 1874, p. 366; *Shelley, Cat. B. M.* xix, p. 363 (1891); *Alexander, Ibis*, 1900, p. 107 [Zambesi].

Description. *Adult male.*—Forehead, crown and ear-coverts dark brown, a very distinct buffy-white eyebrow; nape, upper back and sides of the head and neck buffy-white with conspicuous white shafts and black edges to the feathers; wings rufous-brown, a few of the wing-coverts with white shafts and the primaries more rufous, tipped with brown; rump and tail-coverts dark green barred with pale rufous; tail-feathers dark green, narrowly tipped with white and barred at the base with pale rufous; below, buffy-white, the feathers at the base of the throat and upper breast, including the under wing-coverts, with marked white shafts and dusky edging, those of the flanks also barred with dusky.

Iris pink; bill, legs and feet black.

Length 14·25; wing 6·20; tail 8·5; tarsus 1·60; culmen 1·20.

The sexes are alike; the young has rufous-buff shaft stripes to the black crown, a rufous-buff eyebrow, cheeks and ear-coverts and back of the neck, mantle and wing-coverts barred chestnut and black.

Distribution.—From southern Arabia and Socotra southwards through Somaliland and East Africa to the Zambesi and Natal; it has also been obtained in the Colony. Owing to a certain amount of confusion in regard to the members of this genus it is impossible to give any very exact details regarding the distribution of this species, and it is possible that some of the references given to *C. burchelli* may apply to this, and *vice versa*.

However, an example in the South African Museum alluded to by Layard as having been received from Swellendam in the flesh from Sir Richard Southey, agrees in every respect with another undoubted example of the present species also in the Museum collection, obtained at Mombasa. It is easily distinguishable from *C. burchelli* by its brown head, the strong shaft marks bordered by black all over the mantle and sides of the head and by its very distinct whity eyebrow.

Habits.—This species does not appear to differ in this respect from Burchell's Coucal.

Three eggs in the South African Museum, taken by Mr. A. D. Millar at Sydenham near Durban, on October 22, are oval and pure white, and measure 1.40×1.05 .

477. *Centropus nigrorufus*. *Natal Coucal*.

Le Coucal noiru, *Levaill. Ois. d'Afr.* v, p. 78, pl. 220 (1806).

Cuculus nigrorufus, *Cuvier, Règne Anim.* i, p. 426 (1817).

Centropus nigrorufus, *Layard, B. S. Afr.* p. 245 (1867); *Sharpe, P. Z. S.* 1873, p. 623; *id. ed. Layard's B. S. Afr.* pp. 165, 810 (1876-84); *Shelley, Cat. B. M.* xix, p. 357 (1891); *id. B. Afr.* i, p. 122 (1896); *Marshall, Ibis*, 1900, p. 253 [Mashonaland].

Description. *Adult male*.—Head, neck all round, upper tail coverts and underside throughout, black; middle of the back mottled pale rufous and black; wings rufous with white shaft marks, some of the outer primary coverts barred with black, the primary quills tipped with black, and the inner secondaries mottled and barred with the same colour; tail-feathers black, the central pair strongly barred and tipped with pale rufous, the bars becoming less distinct till the outer pair are plain black; under wing-coverts rufous.

Iris hazel; bill, legs and feet black.

Length 12.0; wing 6.10; tail 6.75; culmen 0.80; tarsus 1.40.

Distribution.—East Africa from Witu in British east Africa to Natal and perhaps Cape Colony, ranging across by the Zambesi valley to Angola and Gaboon on the west.

In South Africa this bird appears to be very rare except in Mashonaland. Levaillant more than a hundred years ago procured the type on the Zwart river in Knysna, but so far as I am aware it has not been since obtained within the boundaries of the Colony; Wahlberg shot a specimen near Durban now in the British Museum, while there are two examples in the South African Museum from the Zand river in the Lydenburg district of the Transvaal, and from the Leshuma river near the Victoria Falls; recently Mr. Marshall has found it not uncommon near Mazoe north-east of Salisbury.

Habits.—Levaillant only obtained one pair of this Cuckoo, they were hovering about the carcass of a buffalo which he had shot, but were kept off by the crows; only insects were found in their stomachs.

The nest has been found by Mr. Darling, whose account as given by Mr. Marshall is as follows:—"On January 13 I took a nest of *C. nigrorufus* in long and thick grass in a vlei; the bird

flew out beside me or I should not have found it, so artfully was it concealed, being woven out of the living grass, so that it kept green all the time, and when I stood only a couple of yards away it was impossible to discern the nest. This was situated about two feet from the ground, domed and with a small aperture at the side, the grass being very finely and carefully woven in small plaits or wisps and not in single blades, and the tops protruding freely for some distance above the nest. The eggs were four in number, pure white, and almost spherical—just like a very large Kingfisher's."

The stomach of the only individual examined by Mr. Marshall contained the remains of beetles. These birds like other Coucals appear to be residents.

Genus II. **CEUTHMOCHARES.**

Type.

Ceuthmochares, *Cab. & Heine, Mus. Hein.* iv, p. 60 (1862). *C. æneus*.

Bill hardly so deep or strong as in *Centropus*; nostril a narrow slit, closed in above by membrane; feathers of the back and breast soft and normal not bristle-like; wings and tail as in *Centropus*; tarsus strong, claws all rather short and curved, that of the hallux or hind toe normal and like the others.

Three species only are ascribed to this genus; all are confined to Africa south of about 15° N. lat.

478. **Ceuthmochares australis.** *Green Coucal.*

Zanclostomus æneus (*nec Vieill.*), *Gurney, Ibis*, 1859, p. 248 [Natal]; *Layard, B. S. Afr.* p. 247 (1867).

Ceuthmochares australis, *Sharpe, P. Z. S.* 1873, p. 609; *Shelley, Ibis*, 1875, p. 82 [Durban dist.]; *Sharpe, ed. Layard's B. S. Afr.* p. 161, pl. v, fig. 1 (1876); *Shelley, Cat. B. M.* xix, p. 403 (1891); *id. B. Afr.* i, p. 122 (1896); *Sharpe, Ibis*, 1897, p. 499 [Zululand]; *Woodward Bros. Natal B.* p. 121 (1899); *W. L. Sclater, Ibis*, 1899, p. 286 [Inhambane]; *Woodward Bros. Ibis*, 1900, p. 521.

Description. *Adult.*—Above, dull green of an ashy shade on the head and neck, becoming a metallic-olive on the wings and tail; below, the throat and breast a paler ashy-green; abdomen and under wing-coverts slaty-grey, under tail-coverts like the tail, a metallic olive-green.

Iris dark red; bill yellow, with a dusky black patch at the

base of the upper mandible above the nostrils; legs and feet black.

Length 13·25; wing 4·90; tail 8·20; culmen 1·1; tarsus 1·1.

Distribution.—This bird is confined to east and south-east Africa, from Kilimanjaro and Lamu in British east Africa southwards through German territory and Nyasaland to Natal.

It is not uncommon near Durban, where it has been obtained by Ayres, Shelley and Millar; it is also found in Zululand (Woodward), and at Inhambane (Francis), but does not appear to extend any great distance away from the coast lands.



FIG. 69.—Left foot of *Ceuthmochares australis*. $\times \frac{1}{4}$.

Habits.—The Green Coucal frequents dense bush, where it creeps about like a Mouse bird; it is not very active, and feeds principally on locusts and large grasshoppers. The Woodwards state that it has a very extraordinary long-drawn-out cry preceded by a chuckling sound.

Mr. Millar gives me the following account: "This Coucal is generally found in pairs along the coast belt of bush, creeping about the thickets in search of food. It builds its own nest, consisting principally of leaves and small twigs, which is placed in a thicket from 10 to 15 feet from the ground. The last nest I took on November 8, 1899, at Clairmont (near Durban), contained three

white eggs measuring 1.08 × 0.95. The bird was on the nest sitting, the eggs being slightly incubated.

“ Unless one is fortunate in noticing the birds building, the nest is very difficult to discover, and consequently few are observed.”

Family II. MUSOPHAGIDÆ.

Bill stout and short; head always crested; wing with ten primaries; tail of ten feathers; feet semi-zygodactyle, *i.e.*, the fourth toe turned forwards or backwards at the will of the bird; nest open like that of a pigeon; eggs white. Anatomical characters are: oil gland present and tufted; spinal feather tract well defined on the neck and continued down the back without forking.

A peculiar red colouring matter named turacin is found in the wing-feathers of most of the birds of this family. A more detailed account of the matter is given below in the notice of the habits of *Turacus corythaix*.

This family, at the present day, is strictly limited to the continental portion of the Ethiopian region.

Key of the Genera.

- A. Wing-quills coloured red with turacin.
- a.* Nostrils entirely concealed by the frontal feathers *Turacus*, p. 212.
 - b.* Nostrils exposed, about half way between the tip of the bill and the frontal feathers *Gallirex*, p. 217.
- B. Wing-quills ashy like the rest of the plumage, no red colouring matter; nostrils linear, nearer the forehead than the base of the bill *Schizorhis*, p. 219.

Genus I. TURACUS.

Type.

Turacus, *Cuv. Leçons Anat. Comp.*, i, Tab. 2 (1800)..T. macrorhynchus.

Bill appearing very small, the posterior portion being hidden by the frontal feathers which also conceal the nostrils; head strongly crested; wings rounded, the secondaries about equal to the primaries in length, the wing shorter than the tail; first primary more than half the length of the fifth, the longest; tail of ten feathers slightly rounded and graduated; tarsus strong, fourth or outer toe reversible at will; plumage chiefly green

and blue with a peculiar red pigment (turacin) on the wing-quills.

Seventeen species of this genus, which is confined to the Ethiopian region, are recognised; only two of these are found within our limits.

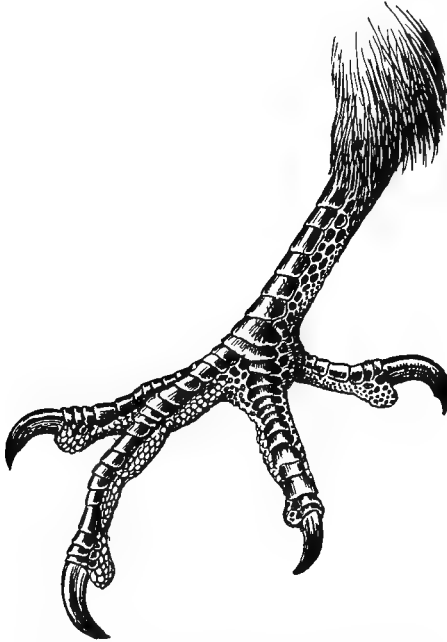


FIG. 70. —Left foot of *Turacus corythaix*. $\times \frac{1}{2}$.

Key of the Species.

- A. Crest evenly rounded throughout *T. corythaix*, p. 213.
 B. Crest with the anterior portion much elongated,
 so that it is pointed in front *T. livingstonii*, p. 216.

479. **Turacus corythaix.** *Knysna Plantain Eater* or *Lourie*.

Le Touracou Louri, *Levaill. Hist. Nat. Promerops*, p. 29, pl. xvi (1806).
Spelectos corythaix, *Wagler, Syst. Av. Spelectos*, sp. i (1827).
Corythaix musophaga, *Dubois, Gel. Ois.* p. 2, pl. ii (1839); *Gurney, Ibis*, 1873, p. 255 [Natal]; *Shelley, Ibis*, 1875, p. 81 [near Durban];
Sharpe, ed. Layard's B. S. Afr. p. 141 (1875); *Barratt, Ibis*, 1876, p. 199; *Ayres, t.c.* p. 432 [Lydenburg].

- Turacus albocristatus*, *Strickl. Ann. Nat. Hist.* vii, p. 33 (1841).
Corythaix albocristatus, *Grill, K. Vet. Akad. Handl. Stockholm*, ii, no. 10, p. 45 [Knysna]; *Verreaux, P. Z. S.* 1871, p. 40.
Musophaga albicristata, *Schl. and Westerm, Toerako's*, p. 18, pl. xi (1866),
Turacus persa, (*nec Linn.*), *Layard, B. S. Afr.* p. 223 (1867); *id. Ibis*, 1869, p. 372; *Holub & Pelz. Orn. Süd-Afr.* p. 138 (1882).
Turacus corythaix, *Shelley, Cat. B. M.* xix, p. 440 (1891); *id. B. Afr.* i, p. 119 (1896); *Rendall, Ibis*, 1896, p. 168 [Barberton]; *Woodward Bros. Natal B.* p. 121 (1899); *id. Ibis*, 1900, p. 519 [St. Lucia Bay].
 "Lourie" of Colonists; "Igolomi" of Amaxosa (Stanford); "Igwala-wala" of the Zulus (Woodward).



FIG. 71.—*Turacus corythaix*. $\times \frac{9}{10}$.

Description. Adult male.—Head, neck all round, throat and chest grass-green; the tips of the long feathers of the crown which form an evenly rounded crest, white; in front and below the eye a black spot separates a short white eyebrow from another white stripe which runs from below the eye to the ear-coverts; back greenish-blue becoming steely-blue or green on the wings and tail; wing-quills including the outer secondaries bright crimson edged and tipped with dusky-black; abdomen and under tail-coverts slaty.

Iris brown, bare skin round the eye red; bill orange-red; legs black.

Length 18·0; wing 7·0; tail 8·25; culmen 1·0; tarsus 1·70.

The female resembles the male.

Distribution.—The Knysna Lourie is found only in the southern and eastern forested portions of South Africa from George in the Colony eastwards through Natal, Zululand, and the eastern Transvaal.

The following are recorded localities: Cape Colony—George and Knysna (Victorin), Stockenstrom (Atmore), King Williams Town (Bt. Mus.), Peddie and Port St. John's (S. A. Mus.), East London (Barratt and Rickard); Natal—Near Durban (Shelley), St. Lucia Lake (Woodward); Transvaal—Near Barberton (Rendall), Lydenburg dist. (Barratt).

Habits.—This bird, known as the Touraco or Plantain Eater in Europe, as the Lourie in South Africa, is entirely confined to forest districts, where it frequents high trees, seldom descending except during rainy weather; its flight is very light and graceful as it glides from bush to bush, feeding on wild figs and other forest fruits; the old birds are usually seen in pairs, the younger ones in small parties.

The cry is a loud croaking sound uttered in early morning and at sundown; at this time they are easily traced, but during the day when they are silent it is very difficult to find them. The nest is built like that of a pigeon, of sticks laid horizontally in the centre of a thick bush usually about ten feet above the ground, and is of the size of a large dinner plate; the eggs five in number are pure white, and of about the same size as those of a tame pigeon, according to Rickard who found a nest near East London on January 27.

Perhaps the most interesting peculiarities about this bird (which it shares with most of the other members of the family) is the presence of a peculiar red pigment on the wing-feathers, named by Professor Church (*Phil. Trans.*, vol. 159, pp. 627-636 (1870), and vol. 183 A., p. 511 (1893), Turacin.

This pigment is soluble to a certain extent in water and exceedingly so in a soapy (*i.e.*, alkaline) solution, and it has been observed by Verreaux and many others since, that during heavy rains these birds descend from the higher branches of the trees and seek shelter in the lower and thicker undergrowth to avoid the wet, but that notwithstanding this their plumage often becomes so saturated with moisture that they are quite unable to fly and they can then be caught with the hand. At this time the greater part of the red colouring matter of the wings has become washed out. The same

effect can be produced artificially by rubbing the feathers with soapy water, when they can be reduced to a dull white or grey colour. The bird, moreover, has the power of renewing the turacin of the wings, and very shortly after the plumage becomes dry the colour is as brilliant as ever.

Turacin was carefully analysed by Professor Church and was found to contain in addition to the usual carbon, hydrogen, nitrogen and oxygen, about 7 per cent. of copper, a substance not usually found in organic compounds and never in such large quantities. Many suggestions have been put forward as to whence the bird derives this metal, but it is probable that the presence of small quantities of it in plantains, bananas, and other fruits on which these birds feed is sufficient to account for the matter without having recourse to suppositions about their swallowing grains of malachite and other copper ores as has been suggested.

480. **Turacus livingstonii.** *Livingstone's Lourie.*

Turacus livingstonii, *Gray, P. Z. S.* 1864, p. 44; *Shelley, Cat. B. M.* xix, p. 439; *id. B. Afr.* i, p. 119 (1896); *Sharpe, Ibis*, 1897, p. 499 [Zululand]; *Woodward Bros. Natal B.* p. 123 (1899).

Corythaix livingstonii, *Kirk, Ibis*, 1864, p. 328; *Sharpe, ed. Layard's B. S. Afr.* p. 143 (1875).

Turacus schalowi, *Marshall, Ibis*, 1900, p. 254 (Mashonaland).

Description.—Head, neck, and chest, grass-green, feathers of the crest and nape tipped with white; front feathers of the crest elongated about 3·5 to 4·0 inches, but rapidly shortening behind so that when elevated the crest is very high in front and falls very rapidly behind, whereas in *T. corythaix* the crest is evenly rounded and nearly of the same length throughout; white patch in front and below the eye not so extensive as in *T. corythaix*, rest of the back, wings and tail as in *C. corythaix*.

Bill orange; iris brown; bare skin round the eye bright red; legs black.

Length about 17·0; wing 6·75; tail 7·0; visible culmen 0·60; tarsus 1·60.

Distribution.—East Africa from Igogo in German territory southwards through Nyasaland and Mozambique to Zululand. If, as I cannot help thinking will eventually prove to be the case, *Turacus schalowi* is the same bird, its range will extend to Mossamedes and Benguela on the western side of Africa.

Within our limits this bird has hitherto been found only in the Ubombo district of Zululand by the Woodwards, and on the Hanyani river in Mashonaland by Darling.

Genus II. **GALLIREX.**

Type.

Gallirex, *Less. Echo du Monde Savant*, col.

100 (1844) *G. porphyreolophus*.

Head crested, but the feathers do not cover the upper mandible, so that the nostrils are exposed; these are oval and placed about half way between the tip of the bill and the forehead. Wings, tail and coloration of plumage as in *Turacus*.

Only two closely allied species from south and east Africa are recognised.*

Key of the Species.

- A. A shade of pink over the green mantle and chest *G. porphyreolophus*, p. 217.
 B. No shade of pink over the mantle and chest *G. chlorochlamys*, p. 219.

481. **Gallirex porphyreolophus.** *Purple-crested Lourie.*

Corythaix porphyreolophus, *Vigors, P. Z. S.* 1831, p. 93; *A. Smith, Ill. Zool. S. Afr. Aves*, pl. 35 (1839); *Gurney, Ibis*, 1862, p. 32 [Natal]; *Layard, B. S. Afr.* p. 227 (1867); *Sharpe, ed. Layard's B. S. Afr.* p. 142 (1875); *Shelley, Ibis*, 1875, p. 82 [near Durban]; *Selous, Hunter's Wanderings*, 2nd ed. p. 415 (1890) [Mashonaland].

Corythaix burchelli, *A. Smith, S. Afr. Quart. Journ.* no. 5, p. 13 (1831).
Gallirex porphyreolophus, *Shelley, Cat. B. M.* xix, p. 446 (1891); *id. B. Afr.* i, p. 120 (1896); *Sowerby, Ibis*, 1898, p. 572 [Mashonaland]; *Woodward Bros. Natal B.* p. 122 (1899); *Marshall, Ibis*, 1900, p. 254.

Description. *Adult.*—Forehead and sides of the head and face metallic-green; crown, nape and crest metallic-purple; upper part of the back, shoulders, sides of the neck, throat and breast grass green, the back and centre of the breast with a strong pinky shade; the rest of the back, wings and tail, lilac-blue with green metallic reflexions in certain lights; wing-quills crimson with the edges and tips dusky black; under wing-coverts, sides of the body, and abdomen, slaty.

* A third (*G. johnstoni*) has recently been described from Mt. Ruwenzori,

Iris dark brown; eyelids scarlet; bill and legs black.

Length about 16·5; wing 7·1; tail 8·0; tarsus 1·8; culmen 1·0.

The sexes are alike.

Distribution.—Confined to south-east Africa, ranging southwards from the Zambesi to Natal, and extending on to Knysna according to Layard. I do not know on what authority Layard makes this statement, for no other collector, such as Levillant, Victorin, or Andersson obtained the bird there, nor have I any notice of its occurrence further east in the Colony. North of the Zambesi the present species is replaced by a very closely-allied form (*G. chlorochlamys*) which extends to Abyssinia.



FIG. 72.—*Gallirex porphyreolophus*. $\times \frac{1}{4}$.

The following are South African localities: Cape Colony—Knysna (Layard); Natal—Durban (Smith and Shelley); Transvaal—Oliphants' river (S. A. Mus.); Rhodesia—Fort Chiquaqua (Sowerby), Umfuli river (Selous), and Mazoe (Marshall) all in the low veld.

Habits.—The Purple Lourie is common in the dense bush along the sea coast of Natal, but retreats inland for about fifteen miles, according to Ayres, in the spring, returning during the summer, autumn, and winter; to the coast. Several birds are often to be

seen together, hopping and climbing about among the branches of the larger trees, and playing antics with one another, depressing and expanding their tails and displaying the rich crimson of their wings. They have a loud and harsh voice, compared by Shelley to the name often applied to them "Tourakoo," generally heard at early morning and in the evening. The food consists of hard nutty berries and small fruits which are swallowed whole. Hitherto nothing has been recorded regarding their nesting habits.

482. **Gallirex chlorochlamys.** *Zambesi Purple-crested* *Lourie.*

Gallirex chlorochlamys, *Shelley, Ibis*, 1881, p. 118; *id. Cat. B. M.* xix, p. 447 (1891); *id. B. Afr. i.*, p. 120 (1896); *Alexander, Ibis*, 1900, p. 106.

Description.—Similar to *G. porphyreolophus*, but having the grass-green portions of the plumage uniform with no trace of the pink shade.

Distribution.—From the Zambesi valley northwards through east Africa to Ugogo (whence came the type obtained by Sir John Kirk) and Abyssinia. Mr. Alexander secured two females of this species on October 28, below Zumbo on the Zambesi, which brings it definitely within our limits.

Genus III. **SCHIZORHIS.**

Type.

Chizærhis, *Wagl. Syst. Av.* p. 111 (1827) *S. africana*.

Schizorhis, *Wagl. Isis*, 1829, p. 656..... *S. africana*.

Head crested; nostrils exposed, linear, at the base of a curved groove situated close to the base of the mandible; wings more pointed than in the other two genera, the difference between the length of the primaries and secondaries being a good deal more than the length of the culmen; plumage dull coloured, chiefly grey without blue or green, and with no red pigment (turacin) on the wings.

Of four species spread over the Ethiopian region only the one below described comes within our limits.

483. **Schizorhis concolor.** *Grey* *Lourie.*

Corythaix concolor, *A. Smith, S. Afr. Quart. Journ.* (2) no. 1, p. 48 (1833).

Colyphimus concolor, *A. Smith, Rep. Exp. Centr. Afr.* p. 54 (1836).

Chizærhis concolor, *Smith, Ill. Zool. S. Afr. Aves*, pl. 2 (1838).

Schizorhis concolor, *Layard, B. S. Afr.* p. 224 (1867); *Ayres*,

1869, p. 296 [Limpopo]; *Layard, t.c.* p. 372 [Matabeleland]; *Exton, Ibis*, 1871, p. 107 [Kanye]; *Gurney in Andersson's B. Damaraland*, p. 204 (1872); *Buckley, Ibis*, 1874, p. 366; *Sharpe, ed. Layard's B. S. Afr.* pp. 144, 809 (1875-84); *Barratt, Ibis*, 1876, p. 199 [Rustenburg]; *Oates, Matabeleland*, p. 304 (1881); *Shelley, Ibis*, 1882, p. 245 [Mashonaland]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 139 (1882); *Shelley, Cat. B. M.* xix, p. 453 (1891); *id. B. Afr.* i, p. 120 (1896); *Sharpe, Ibis*, 1897, p. 498 [Zululand]; *Sowerby, Ibis*, 1898, p. 571; *Woodward Bros. Natal B.* p. 124 (1899); *Alexander, Ibis*, 1900, p. 106 [Zambesi]; *Marshall, t.c.* p. 254.

"Go-way" bird of English; "Groote Muisvogel" of Dutch Africaners; "Maquaai" of Bechuanas (Exton).

Description. *Adult male.*—General colour above and below an



FIG. 73.—*Schizorhis concolor*. $\times \frac{1}{4}$.

ashy-grey; a crest of long decomposed feathers on the crown; outer wing-coverts, quills, and outer tail-feathers brown; a faint wash of olive usually present on the chest.

Iris brown; bill, legs and feet black.

Length about 18; wing 8.3; tail 10.0; culmen 1.05; tarsus 1.55.

The female resembles the male but is slightly smaller, wing 8.0; tail 9.0; tarsus 1.50.

Distribution.—This bird is not found within the limits of the Colony nor in Natal strictly speaking, but north of the Malopo in the neighbourhood of Mafeking and on the Umfolosi river in Zulu-

land, it is abundant in suitable localities up to the Zambesi, and beyond in Angola and Nyasaland; it is not however included by Reichenow in the fauna of German east Africa.

The following are the chief recorded localities: Zululand—Ulundi (Woodward); Transvaal—Lydenburg district (Francis in S. A. Mus.), Swaziland (Bt. Mus.), Rustenburg and Marico (Barratt); Bechuanaland—from the Malopo river northward (Holub), Kanye (Exton), Lake Ngami district (Andersson); Rhodesia—Matabeleland (Holub), Salisbury, Bulawayo road (Sowerby); German south-west Africa—Otjimbingue and Okavango river (Andersson); Portuguese east Africa—Tete (Bt. Mus.).

Habits.—The “Go-way” bird, as it is generally called by hunters and travellers, is usually seen in small parties of from six to twelve birds clumsily and lackadaisically making short flights from one clump of trees to another; they are seldom very far from water and during the heat of the day effectually conceal themselves in the central and densest portions of large and thick foliated trees. They erect and depress their crests at will and in this respect as well as in many other ways resemble the Colies or Mouse-birds in their habits: hence the Dutch name.

Their food consists chiefly of berries and fruits and they are said to be specially fond of the berries of the mistletoe and other parasitic plants. They are not exclusively frugivorous however, as remains of insects have been found in their stomachs and Holub states that they even kill and devour small birds, feathers and all. Though wary and shy as a rule they are often betrayed by their harsh and loud cry of “kway-kway” from which the Colonial name is derived. This, which is constantly repeated, is compared by some to the mewing of a cat and by others to the “agonised scream of a young buck seized by a dog.” Hunters execrate this bird as it so often warns the game of their approach.

Nests of this bird were found by Eriksson in November and December on the Limpopo and by Andersson in January at Omapju in Damaraland. They are rough structures composed of a few sticks put together in the fork of a tree, so untidily that the eggs can generally be seen through from below. The eggs, three in number, of a dull bluish-white colour, are somewhat large for the size of the bird.

Order III. PSITTACI.

This order, containing the Parrots, unlike the previous order *Picariæ*, is a very distinct and well marked one with no very near allies. Perhaps their nearest affinities are with the Owls and Birds of Prey.

They can be distinguished at once from all other birds by their zygodactyle feet, the shape of their dorsal vertebræ, which are opisthocœlous or concave posteriorly, and by the fact that the upper mandible is loosely articulated to the posterior part of the skull so as to be slightly moveable.

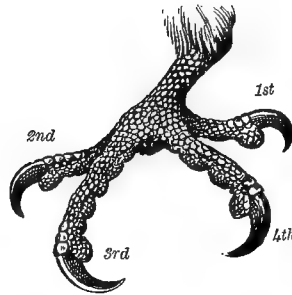


FIG. 74.—Left foot of *Pœoccephalus fuscicapillus*, toes numbered. $\times \frac{1}{4}$.

Other characteristics are as follows: Bill short, stout, and hooked; palate desmognathous; a fleshy, generally swollen space between the base of the beak and the forehead called the cere, within which open the nostrils; tongue thick and fleshy; plantar tendons galline; no cœca on the intestine; spinal feather tract well defined on the neck and forked on the upper back; oil gland if present tufted; twelve tail-feathers (except in one genus); ten primaries.

The Parrots lay white eggs in holes in trees usually excavated by themselves; they make no nest beyond the wood chips, and the young are hatched naked and do not pass through a downy stage.

Family I. PSITTACIDÆ.

Both the South African genera belong to this generalised and extensive family, which is distributed over the inter-tropical and sub-tropical regions of both hemispheres.

Key of the Genera.

- A. Nostrils exposed, placed in the middle of a wide and swollen cere *Pœocephalus*, p. 223.
 B. Nostrils concealed by feathers at the inner edge of a very narrow cere..... *Agapornis*, p. 231.

Subfamily I. PIONINÆ.

Tail short and broad, square or rounded, usually about half the length of the wing; bill moderately strong; upper mandible usually notched and always with the palatal portion of the hook furnished with a file-like surface; cere surrounding the whole base of the bill, swollen in front of the nostrils and always naked; wings with the second, third, and fourth primaries generally the longest; general colour mostly green.

Genus I. PŒOCEPHALUS.

- Type.*
Pœocephalus, *Swains. Class. B. ii*, p. 301 (1837)..... *P. senegalus*.
Pœocephalus, *Strickl. Ann. Mag. N. H. vii*, p. 34
 (1841)

Bill stout and strong, the under mandible deeper than long, edge of the upper mandible notched, the under or palatal surface

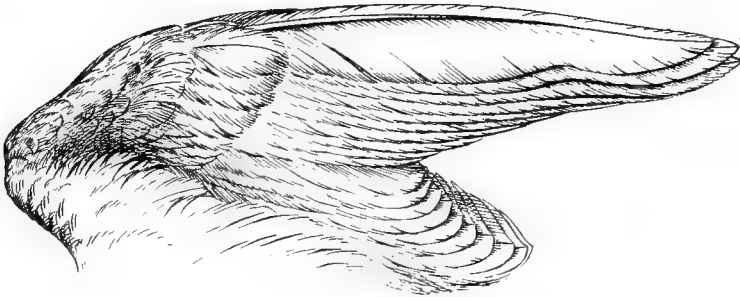


FIG. 75.—Wing of *Pœocephalus fuscicapillus* from below. $\times \frac{2}{3}$.

of the hooked anterior portion roughened and file-like; cere naked and swollen, the nostrils well within its limits; wing long and pointed, the second and third primaries equal and longest, the first and fourth rather shorter. About fourteen species of this

genus have been described; they are confined to the Ethiopian region and five out of the fourteen are South African.

Key of the Species.

- A. Rump green.
 a. Larger, wing more than 8·0; edge of wing
 vermilion.
 a¹. Head and neck olive-yellow *P. robustus*, p. 224.
 b¹. Head and neck silvery-grey *P. fuscicollis*, p. 226.
 b. Smaller, wing about 6·0; edge of wing green
 like the upper surface *P. fuscicapillus*, p. 226.
 B. Rump blue.
 a. Breast greenish-blue contrasting with the
 throat, usually a yellow band across the
 crown *P. meyeri*, p. 228.
 b. Breast slaty-brown like the throat *P. rueppelli*, ♀, p. 229.
 C. Rump smoky-brown like the rest of the upper
 surface *P. rueppelli*, ♂, p. 229.

484. **Pœocephalus robustus.** *Levaillant's Parrot.*

Psittacus robustus, *Gmel. Syst. Nat.* i, p. 344 (1788); *Sharpe, ed. Layard's B. S. Afr.* p. 194 (1876); *Holub & Pelzeln, Orn. Süd-Afr.* p. 160 (1882); *Shelley, Ibis*, 1882, p. 249 [Mashonaland].

Psittacus levaillantii, *Lath. Syn. Suppl.* p. xxii (1802); *Layard, B. S. Afr.* p. 230 (1867).

Le Perroquet à franges sourci, *Levaill. Perroq.* ii, p. 91, pls. 130-1 (1805).

Pionus robustus, *P. L. Sclater, P. Z. S.* 1866, p. 22 [Cathcart].

Pionias robustus, *Finsch, Papag.* ii, p. 475 (1868).

Pœocephalus robustus, *Gurney, Ibis*, 1873, p. 255 [Natal]; *Salvad. Cat. B. M.* xx, p. 363 (1891); *Shelley, B. Afr.* i, p. 138 (1896); *Woodward Bros. Natal Birds*, p. 125 (1899).

"Isikweyiya" of Amaxosa (Stanford). "Isikwenene" of the Zulus (Woodward).

Description. Adult.—Head and neck all round olive-yellow with brown centres to some of the feathers especially on the forehead, and a reddish tinge on the chin; the forehead sometimes red sometimes like the rest of the crown; lores black; mantle, scapulars, wings and tail dusky-black. Some of the feathers especially of the mantle and wing-coverts edged and tipped with dull green; band round edge of the wing and lower tibial plumes vermilion; rump and upper tail-coverts, lower breast, abdomen, and under tail-coverts bright grass-green; upper under wing-coverts dark green, lower slaty.

Iris reddish-brown; bill whitish-brown; legs and feet bluish-grey.

Length 13·75; wing 8·25; tail 3·70; culmen 1·65; tarsus 0·75.

The sexes are alike; the young birds want the red at the bend of the wing and on the thighs.

Distribution.—Levaillant's Parrot is found only in the southern and eastern portions of the Colony, in Natal, and probably in Mashonaland and Nyasaland, but it appears to be local everywhere. Though stated by Layard to be found in Knysna it has not been noticed there by Victorin or any other collector.

The following are recorded localities: Cape Colony—The Zuurberg in Uitenhage div. (S. A. Mus.), Eland's Post in Stockenstroom (Atmore), Windvogelberg in Cathcart (Boulger), Pirie bush, near King Williams Town and Port St. John's (S. A. Mus.); Natal—chiefly in the upper districts (Woodward), Umgeni falls near Maritzburg (Gurney), Newcastle (Bt Mus.); Rhodesia—Mashonaland (Ayres).

Habits.—Levaillant, whose name it bears, first accurately described this Parrot; he gives a long account of it as observed by him in the eastern portion of Cape Colony, stating that its habits are extremely regular.

In the early morning they are to be found in considerable flocks on certain dead bare trees sunning themselves and drying their damp plumage. From about ten to eleven in the morning they disperse to feed, chiefly on the nuts and seeds of the Geelhout (*Podocarpus*) and the Wilde Kersen (*Pterocelastrus*?). During the heat of the day they rest in the recesses of the forest. In the afternoon they again feed, and later on resort in large companies to special watering places to bathe and drink; an evening toilette is performed on the bare dead trees and finally they disperse to roost at night. They nest in holes in trees and lay four round white eggs about as large as those of a domestic pigeon, and both male and female assist in the incubation.

The best modern account of these birds is that of the Woodwards who state as follows: "These Parrots like the rest of their tribe are gregarious and congregate in large numbers in the upper districts of Natal, seldom visiting the coast. They frequent the highest trees sitting quietly during the day, but as evening draws on they fly out in search of food, making the woods resound with their shrill cries. Owing to their wild nature they are rather difficult to approach and the only specimens we obtained were on the Upper Umzimkulu."

485. **Pœocephalus fuscicollis.** *Brown-necked Parrot.*

Psittacus fuscicollis, *Kuhl, Consp. Psitt.* p. 93 (1820); *Sharpe, ed. Layard's B. S. Afr.* p. 195 (1876).

Pionias fuscicollis, *Finsch, Papag.* ii, p. 473 (1868).

Poicephalus robustus (*nec Gmel.*), *Gurney in Andersson's B. Demaraland*, p. 213 (1872).

Pœocephalus fuscicollis, *Salvad. Cat. B. M.* xx, p. 364 (1891); *Shelley, B. Afr.* i, p. 139 (1896); *Marshall, Ibis*, 1900, p. 254 [Mashonaland].

Description. *Adult.*—Head and neck silvery-grey with brown centres to most of the feathers, cheeks and chin with a reddish tinge; forehead and sometimes the vertex rose-red; back and wings green, the colour brightest on the edges of the feathers; wing-quills and tail-feathers dusky-black; edge of the wing and thighs vermilion; lower back, rump and upper tail-coverts and lower surface from the breast downwards, grass-green.

Iris dark brown; bill whitish; legs and feet black.

Length about 12; wing 8·0; tail 3·7; culmen 1·6; tarsus 0·75.

The sexes are alike, the young bird has no red on the head, edge of the wing and thighs.

Distribution.—The Brown-necked Parrot is found in western Africa in Gaboon, Angola and the northern portion of German south-west Africa; it extends across the head waters of the Zambesi to Mashonaland and German east Africa.

It seems likely that it is this species and not *P. robustus* which is found in Mashonaland and Nyasaland.

The following are South African localities: Rhodesia—Mashonaland (Marshall); German south-west Africa—Ondonga and Sishongo (Andersson in *Bt. Mus.*), Ochimbora (Eriksson in *S. A. Mus.*).

Habits.—Mr. Andersson states that this Parrot is very wild and difficult to approach and that it is only in the dry season in early morning and late evening, when they come down to the water, that they can be procured.

486. **Pœocephalus fuscicapillus.** *Brown-headed Parrot.*

Pionus fuscicapillus, *Verr. et des Murs, Rev. Mag. Zool.* 1849, p. 58.

Pionias fuscicapillus, *Finsch, Papag.* ii, p. 492 (1868); *Finsch & Hartl, Vög. Ost-Afrikas*, p. 499, pl. 7 (1870).

Psittacus fuscicapillus, *Sharpe, ed. Layard's B. S. Afr.* p. 197 (1876); *W. Ayres, Ibis*, 1887, p. 53 [Oliphant's River].

Pœocephalus fuscicapillus, *Salvad. Cat. B. M.* xx, p. 368 (1891); *Shelley, B. Afr.* i, p. 139 (1896); *Sharpe, Ibis*, 1897, p. 502 [Zululand]; *Woodward Bros. Natal Birds*, p. 126 (1899).
 "Hokgwe" of the natives in Lydenburg dist. (Francis).

Description. *Adult male.*—Head and neck all round grey with an olive-yellow tinge; rest of the upper and under surface green, brightest on the rump and upper tail-coverts; wing-quills and tail dusky-black washed with green; under wing-coverts and axillaries bright yellow.

Iris greenish-yellow; upper mandible horn, lower white; legs and feet black.



FIG. 76. *Pœocephalus fuscicapillus*. $\times \frac{1}{4}$.

Length about 9·0; wing 6·1; tail 2·7; tarsus 0·60; culmen 0·90. The female resembles the male but is slightly smaller (wing 5·70).

Distribution.—East Africa from Mombasa and Zanzibar (whence came the type) to the eastern Transvaal and Zululand.

South African localities are: Natal—Umfolosi river and St. Lucia Lake (Woodward); Transvaal—Swaziland (Buckley in *Bt. Mus.*), Sabi river, Lydenburg (Francis in *S. A. Mus.*), Olifant river (W. Ayres); Portuguese east Africa—Inhambane (Peters).

Habits.—The Woodwards found these Parrots pretty common on the thorn flats of Zululand: "They are generally seen in pairs and fly very rapidly, uttering shrill screams. They are fond of wild figs, the fruit of a huge species of Banyan tree, which grows along the banks of many of the larger rivers, and we have seen them feeding on green mealies in the Kaffir mealie gardens. These Parrots make round holes in the dead trees, where they lay their

eggs. We found one, it was pure white and nearly round." Francis states that this species is found all over the low country on the eastern Transvaal, and that it is very destructive to the natives' crops of corn.

487. *Pœocephalus meyeri*. *Meyer's Parrot*.

Psittacus meyeri, *Cretzsch. Atlas*, p. 18, pl. 11 (1826); *Ayres, Ibis*, 1869, p. 296 [Limpopo Valley]; *Buckley, Ibis*, 1874, p. 369 [S. Matabeleland]; *Barratt, Ibis*, 1876, p. 201 [Rustenburg]; *Sharpe, ed. Layard's B. S. Afr.* pp. 195, 813 (1876-84); *Oates, Matabeleland*, p. 307 (1881); *Shelley, Ibis*, 1882, p. 249 [Mashonaland].

Pœocephalus meyeri, *Strickl. and Sclat. Contrib. Ornith.* 1852, p. 156 [Damaraland]; *Gurney in Andersson's B. Damaraland*, p. 213 (1872); *Ayres, Ibis*, 1886, p. 291; *Salvadori, Cat. B. M.* xx, p. 373 (1891); *Shelley, B. Afr.* i, p. 139 (1896); *Marshall, Ibis*, 1900, p. 254 [Mashonaland]; *Alexander, t.c.* p. 429 [Zambesi].

Pionias meyeri, *Finsch, Papag.* ii, p. 494 (1868); *Holub & Pelz. Orn. Süd-Afr.* p. 159, fig. on p. 168 (1882).

Pœocephalus meyeri transvaalensis, *Neumann, Ornith. Monatsb.* vii, p. 25 (1899).

Description. *Adult*.—Above, brown, a yellow transverse band across the crown between the eyes usually present, but not invariably; a few of the outer upper wing-coverts, the edge of the wing, the under wing-coverts and tibial plumes bright yellow; lower back and upper tail-coverts cobalt-blue; throat, breast and sides of the head brown like the back; rest of the lower surface greenish-blue, the sides of the body somewhat mottled with brown.

Iris deep red-orange, naked skin round the eye black, bill dark horn with a tinge of green; legs and feet greenish-black.

Length about 9.0; wing 6.0; tail 2.75; culmen 0.90; tarsus 0.55.

The sexes are alike. The young bird has no yellow on the crown, the wing-coverts are edged with green, the yellow feathers on the edge of the wing and the under wing-coverts have brown bases, the tibial feathers are green; the iris is olive-brown.

Distribution.—Throughout east Africa from Abyssinia and the Upper Nile Valley to the western Transvaal and Ovampoland. Within our limits it is a common bird from Bechuanaland and the western Transvaal northwards to the Cunene and Zambesi rivers.

The following are localities: Transvaal—Rustenburg and Marico (Ayres and Holub); Bechuanaland—Kanye (Exton), Bamangwato

(Bt. Mus.), Lake Ngami (Bt. Mus.); Rhodesia—Tati (Oates), Umfuli river (Ayres); German south-west Africa—Ondonga (Bt. Mus.), Okavango river (Eriksson in S. A. Mus.); Portuguese east Africa—Tete (Livingstone and Alexander).

Mr. Oscar Neumann has recently divided this species into four sub-species, from Abyssinia, German east Africa, Angola, and the Transvaal respectively. Should this hold good our species will stand as *Pœocephalus meyeri transvaalensis*.

Habits.—Meyer's Parrot is perhaps the most widely distributed and the commonest of South African parrots. It is found in pairs or small parties among high thorn bushes or along the wooded banks of rivers and periodical streams. As with other parrots its flight is rapid and headlong and its note a shrill scream. Holub is the only observer who has noticed the nesting habits of this species; it builds in a hole in a tree, either making it itself or adapting to its needs that of some smaller bird. Holub did not discover the eggs, which are doubtless white like those of other parrots.

This bird is often kept as a pet and becomes exceedingly tame; it is to be seen on many of the farms in the western Transvaal flying in and out of the houses and taking food from the hand. It will eat bread, cooked and uncooked fruits and vegetables, grain and even raw meat, but this latter diet is stated by Holub to cause the birds subsequently to pull out their feathers, a trick not uncommon among caged parrots.

488. *Pœocephalus rueppelli*. *Rüppell's Parrot*.

Psittacus rueppellii, G. R. Gray, *Proc. Zool. Soc.* 1848, p. 125, pl. 5; *Sharpe, ed. Layard's B. S. Afr.* p. 196 (1876).

Pœocephalus rueppelli, *Strickl. and Sclat. Contr. Ornith.* 1852, p. 156 [Damaraland]; *Gurney in Andersson's B. Damaraland*, p. 214 (1872); *P. L. Sclater, Proc. Zool. Soc.* 1882, pp. 421-577, pl. 42; *Salvadori, Cat. B. M.* xx, p. 375 (1891); *Fleck, Journ. Ornith.* 1894, p. 395; *Shelley, B. Afr.* i, p. 139 (1896).

Pionias rueppelli, *Finsch, Papag.* ii, p. 498 (1868).

Description. *Adult.*—General colour above and below smoky-brown; sides of the face and ear-coverts more silvery; lesser wing-coverts on the bend of the wing, edge of the wing and under wing-coverts, yellow; tibial plumes orange-yellow.

Iris orange; bill, feet, and toes dark horn.

Length 8·5; wing 5·60; tail 2·70; culmen 1·0; tarsus 0·60.

The female has the lower back, upper and under tail-coverts bright blue; the young bird is like the female but duller in colour and is without the yellow on the wing; the under wing-coverts are, duller yellow.

Distribution.—Within our limits this species is only found in German south-west Africa, in the middle and southern parts of which it is stated to be fairly common by Andersson and by Fleck, who gives Reheboth and Windhoek as special locations. North of the Cunene it is spread over Angola and perhaps reaches as far as Gaboon.

Habits.—The most remarkable fact in regard to this bird is that the female is the most brightly coloured of the two sexes, having the back and belly bright blue; this when the bird was first discovered caused some confusion, but the facts as stated are well authenticated by careful dissections of specimens which have died in captivity in the Zoological Gardens in London.

Andersson states that he met with this Parrot in small flocks of about half a dozen individuals and that it seemed to prefer the larger kinds of trees. It is rather shy, and when quietly perched among the branches is very difficult to perceive until its presence is betrayed by the cries it utters as soon as it conceives itself to be in danger; these are at first shrill and isolated but increase in strength and frequency until it leaves its perch, and are usually continued during its flight, which is generally short, but very rapid. It is rarely found far from water, which it usually frequents twice a day. It feeds on seeds and berries, sometimes also on young shoots of trees and plants.

Subfamily II. PALÆORNITHINÆ.

Bill moderate, usually deeper than long, culmen round and usually smooth; cere narrow, equally broad throughout, surrounding the whole base of the bill, generally partly feathered; nostrils hidden or exposed; tail long and graduated or short and square; wing with the second and third quills the longest.

Genus I. **AGAPORNIS.***Type.***Agapornis**, *Selby, Nat. Libr. Parrots*, p. 117 (1836) *A. swindereniana*.

Bill moderate, deeper than long, culmen round and smooth; gonyes smooth without median ridge; cere very narrow but extending all round the base of the bill; nostrils at the edge of the cere concealed by feathers; a ring of naked skin round the eyes; wing long and pointed, nearly reaching the end of the tail; second primary the longest, first and third about equal to one another; tail short, less than half the length of the wing, with a subterminal black band on all but the two central feathers and very long upper and under tail-coverts.

Of this genus, confined to Africa and Madagascar, nine species have been described; two reach our limits though one of these only just comes within them in the Zambesi valley. The Madagascar species (*A. cana*) appears to have been introduced or to have established itself in Natal near Maritzburg according to Fitzsimmons.

Key of the Species.

- A. Rump and upper tail-coverts bright cobalt-blue... *A. roseicollis*, p. 231.
 B. Rump and upper tail-coverts like the back, green *A. lilianæ*, p. 233.

489. **Agapornis roseicollis.** *Rosy-faced Lovebird.*

Psittacus roseicollis, *Vieill. N. Dict. H. N.* xxv, p. 377 (1817).

Psittacula roseicollis, *Waterhouse in Alexander's Exped. Int. S. A.* ii, p. 266 (1838) [Gt. Namaqualand]; *Layard, B. S. Afr.* p. 231 (1867); *Finsch, Papag.* ii, p. 640 (1868); *Layard, Ibis*, 1869, p. 372 [Limpopo]; *Gurney, in Andersson's B. Damaraland*, p. 216 (1872).

Agapornis roseicollis, *Strickl. and Sclat. Contr. Orn.* 1852, p. 156; *Sharpe, ed. Layard's B. S. Afr.* p. 192 (1876); *Salvadori, Cat. B. M.* xx, p. 512 (1891); *Fleck, Journ. Ornith.* 1884, p. 395; *Shelley, B. Afr.* i, p. 141 (1896).

Description. Adult male.—Above and below, grass-green; a broad frontal band, sides of the face and throat rosy red, deepest on the forehead, getting paler on the throat; quills dusky washed with green, rump and upper tail-coverts, which extend nearly to the end of the tail, cobalt-blue; tail dark green tipped with a bluish wash, all but the two central feathers with a bright red stripe along the shaft and a subterminal dusky spot; greater under wing-coverts tinged with blue, the others green.

Iris brown ; bill greenish-yellow ; legs grey.

Length 6·6 ; wing 4·0 ; tail 1·75 ; culmen 0·75 ; tarsus 0·50.

The sexes are alike. The young have paler cheeks and chests and a fulvescent forehead.

Distribution.—The Rosy-faced Lovebird is found in south-west Africa from the Orange river valley northwards through German south-west Africa and Bechuanaland to Angola, and perhaps beyond to Gaboon.

South African localities are as follows : Cape Colony—Upington and Kakamas on the Orange river (Bradshaw in S. A. Mus.) ; Transvaal—Limpopo river (Ortlepp and Layard) ; Bechuanaland—Lake Ngami (Andersson) ; German south-west Africa—'Um'uma Mountains, Gt. Namaqualand (Alexander), Omaruru, Ondonga, and Okavango river (Andersson).



FIG. 77.—*Agapornis roseicollis*. $\times \frac{7}{8}$.

Habits.—The only notice of the habits of this little Parrot is that of Andersson which is as follows :—“ This species is always observed in small flocks, and seldom far away from water, to which it resorts at least once a day, and is consequently not a bad guide to a thirsty traveller ; though if he be inexperienced it would hardly avail him much as it frequently happens that the drinking places resorted to by this and other water-loving birds are but of small compass and strangely situated.

“ This species is very swift of flight, and the little flocks in which it is observed seem to flash upon the sight as they change their feeding grounds or pass to and from their drinking-place ; their flight, however, is only for a comparatively short distance at a time. They utter rapid and shrill notes when on the wing, or when suddenly disturbed or alarmed. Their food consists of large berries and berry-like seeds.

“This bird does not make any nest of its own, but takes possession of those belonging to other birds, especially the Social Weaver Bird (*Philetærus socius*) (vol. i, p. 115) and the White-browed Weaver Bird (*Ploceipasser mahali*) (vol. i, p. 83). I cannot say whether it forcibly ejects the rightful owners of these nests, or merely occupies such as have been abandoned, but in the case of the first-named species, I have seen the Parrots and Weaver Birds incubating in about equal numbers under the shelter of the same friendly roof. The egg is pure white not unlike a Woodpecker's but more elongated.” Examples in the South African Museum measure 0.92×0.69 .

These birds are amusing pets in an aviary though somewhat quarrelsome and inclined to bully other birds.

490. *Agapornis lilianæ*. *Nyasaland Lovebird*.

Agapornis lilianæ, *Shelley, Ibis*, 1894, p. 466, pl. 12; *id. B. Afr. i*, p. 141 (1896); *Alexander, Ibis*, 1900, p. 431 [Zambesi].

Description. *Male*.—Head and throat brick-red, inclining to vermilion towards the forehead, the back of the head and hinder neck greenish-yellow; remainder of the plumage bright grass-green, slightly paler and yellower on the under parts; inner webs of the quills dark brown; tail with a blackish subterminal band and a scarlet basal patch on all but the central feathers.

Iris hazel; bill rose coloured; base of mandible and soft parts round the eye, bluish-flesh; legs and feet flesh colour.

Length 5.2; wing 3.45; culmen 0.06; tarsus 0.05.

The female has the head and throat slightly paler; wing 3.5.

Distribution.—The types, obtained by Mr. Whyte and described by Captain Shelley, were shot at Fort Liwondi on the upper Shiré, where this bird had apparently been observed thirty years previously by Sir John Kirk. Mr. Alexander has recently met with the same bird along the Zambesi between Chicowa and Zumbo.

Habits.—This Lovebird is found in flocks of about twenty individuals, the greater number of which are males. They frequent thick undergrowth along the banks of the Zambesi and Shiré rivers in one or two limited localities, and are usually only seen on their way to and from the river, to which they resort daily, uttering as they go rounds of cries almost in unison, but so shrill that they almost set one's teeth on edge.

Order IV. STRIGES.

The Owls, which compose this Order, are a very well-marked and distinct group of birds. They were formerly associated with the *Accipitres* or Birds of prey, but the resemblances between the two are chiefly superficial, and most modern authors are agreed to consider them as forming a separate Order with distant relationships only to the Parrots as well as to the *Accipitres*.

The following are the more obvious external characteristics of the Order :—

Bill short and hooked, the basal portion forming a cere which is generally concealed by the numerous long stiff bristles surrounding the eye and forming a facial disc; a tuft of elongated erectile feathers above the eye, usually termed the ear-tufts, often present; eyes large and forwardly directed; eleven primaries, twelve rectrices; no after shaft to the feathers (except *Strix*); plumage soft and fluffy; outer toe reversible; nest usually in a hole in a tree; eggs always white and rounded; young hatched helpless, but covered with down and cared for by their parents for a considerable period.

Osteological and anatomical characters are: Palate desmognathous; skull with basipterygoid processes; oil gland present and naked (except for small tufts of feathers in *Strix* and *Asio*); spinal feather tract well defined on the neck; of the five Garrodian thigh muscles only the femoro-caudal is present; deep flexors of the toes normal, the flexor hallucis supplying the hallux, the flexor perforans digitorum the second, third, and fourth digits.

The Owls are nocturnal or crepuscular in their habits, shunning as a rule the bright light of the middle of the day; they are carnivorous, feeding on smaller rodents (such as mice) of which they destroy very large numbers; some of the smaller species feed chiefly on insects; all Owls throw up the bones and other indigestible parts of their food in the form of pellets, which are often to be found below their roosting places in great abundance, and an examination of which proves the enormous service they do to man and agriculture.

The Owls may be divided into two families separated by sufficiently distinct characters, the *Strigidæ* containing only two genera, and the *Bubonidæ* containing the majority of Owls.

Key of the Genera.

1. Claw of the middle toe pectinated on its inner side; no ear tufts; facial disc very distinct *Strix*, p. 235.
- B. Claw of the middle toe not pectinated.
- a. Tarsus bare, no ear tufts *Scotopelia*, p. 260.
- b. Tarsus feathered at least for three-fourths of its length.
- a¹. Ear opening larger than the eye, provided with an operculum; facial disc well marked, extending as far below as above the eye.
- a². Ear tufts present; iris always yellow. *Asio*, p. 241.
- b². Ear tufts absent; iris always brown. *Syrnium*, p. 245.
- b¹. Ear opening smaller than the eye, without operculum; facial disc not well defined and hardly extending below the level of the eye.
- a³. Cere normal not swollen; nostrils at its anterior margin; ear tufts present.
- a³. Of large size, wing over 12·0; wings short, falling short of the tail by at least the length of the tarsus. *Bubo*, p. 247.
- b³. Of small size, wing under 8·0; wings long, almost or quite reaching the tail tip..... *Scops*, p. 254.
- b². Cere swollen and pea-shaped, nostrils within its limits; no ear tufts..... *Glaucidium*, p. 256.

Family I. STRIGIDÆ.

Skull long and narrow relatively; sternum with one slight notch posteriorly; the furcula ankylosed to the keel of the sternum; second joint of the third toe considerably longer than the basal joint; claw of the middle toe pectinated on its inner margin.

There are only two genera in this family: *Strix*, which is practically cosmopolitan, and *Heliodilus*, peculiar to Madagascar.

Genus I. STRIX.

Type.

Strix, *Linn. Syst. Nat.* i, p. 133 (1766) *S. flammea*.

Bill somewhat small, compressed and weak; facial disc very complete, the stiff decomposed feathers radiating out in every

direction from the eye and bordered by a series of narrow upstanding stiff feathers forming a surrounding ruff; no ear tufts; wings long and pointed reaching nearly to the end of the tail, the difference between the length of the primaries and secondaries about equal to the tarsus; legs long, tarsus feathered for about two-thirds its length, the lower portion covered by a few bristles only; toes bare or with only a few bristles; claw of the middle toe pectinated along its inner edge.

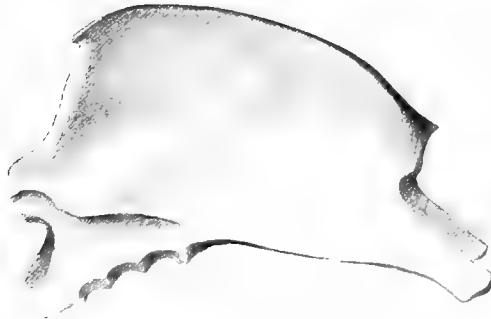


FIG. 78.—Sternum of *Strix flammea*, showing the slight posterior notch. $\times \frac{3}{4}$.

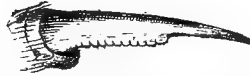


FIG. 79.—Claw of the middle toe of *Strix flammea*, showing the pectination. $\times \frac{3}{4}$.

This genus contains some three or four species in addition to the common Barn Owl, which is cosmopolitan in its range, but which has recently been divided up into a large number of local races or sub-species. In addition to the world-wide form one other species is found within our limits.

Key of the Species.

- | | | |
|----|---------------------------------------------------------------------------|------------------------------|
| A. | Back vermiculated grey; a reddish-brown spot in front of the eye | <i>S. flammea</i> , p. 237. |
| B. | Back brown with a few white spots; a black spot in front of the eye | <i>S. capensis</i> , p. 239. |

491. *Strix flammea*. Barn Owl.

Strix flammea, *Linn. Syst. Nat.* i, p. 133 (1766); *Sharpe, ed. Layard's B. S. Afr.* pp. 82, 802 (1875-84); *id. Cat. B. M.* ii, p. 291 (1875); *Oates, Matabeleland*, p. 300 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 47 (1882); *Butler, Feilden, and Reid, Zool.* 1882, p. 205 [Camperdown]; *Shelley, Ibis*, 1882, p. 204 [Shongo river]; *Fleck, Journ. Ornith.* 1894, p. 395 [Reheboth]; *Rendall, Ibis*, 1896, p. 167 [near Barberton]; *Shelley, B. Afr.* i, p. 141 (1896); *Sowerby, Ibis*, 1898, p. 575 [Chiquaqua]; *Woodward Bros. Natal B.* p. 159 (1899); *Marshall, Ibis*, 1900, p. 261 [near Salisbury].

Strix affinis, *Layard, B. S. Afr.* p. 43 (1867); *Ayres, Ibis*, 1878, p. 284 [Potchefstroom].

Strix poënsis, *Gurney, Ibis*, 1868, p. 105; *id. in Andersson's B. Damaraland*, p. 36 (1871); *Buckley, Ibis*, 1874, p. 362 [Palapye].

“Dood-vogel” of Dutch.

Description. *Adult.*—General colour above, pearly-grey, all the feathers yellowish-buff at their basal halves and vermiculated grey and horn at their apical halves, a more conspicuous white terminal and brown subterminal spot present at the tip of each shaft; wing-quills banded buff and brown, the inner half of the inner webs white; tail buff, with three brown transverse bands and a paler brown tip slightly vermiculated, the outer edge of the outer feather white; facial disc of decomposed feathers radiating outwards from the eye in every direction white, except for a brown spot in front of the eye; ruff surrounding the disc buff above, white below, with a row of black-tipped feathers outside the pure white ones; below, white, the breast washed with buff and the whole spotted with small angular spots of brown; feathery covering of the lower half of the tarsus gradually diminishing; toes with a few scattered bristles.

Iris very dark brown; bill yellow; feet and toes yellow.

Length 16.25; wing 11.70; tail 4.80; tarsus 2.40; culmen 10.0.

The nestling is covered with white down, the feathers which appear first being usually orange coloured.

European birds are usually darker below and the spots are not so numerous or large.

Distribution.—The Barn Owl is one of the most completely cosmopolitan of birds, being found all over the world except in New Zealand and some of the Pacific Isles. As is natural, there is some variation in so wide-ranging a bird, but hardly sufficient to warrant the formation even of sub-species, though this has been done to a considerable extent of recent years.

The Barn Owl is found throughout the greater part of South Africa except perhaps the coast-lands of Natal. It is common throughout the Colony; the Cape division (S. A. Mus.), Port Elizabeth, East London (Rickard), Port St. John's and Beaufort West (S. A. Mus.), Orange river (Bradshaw), being recorded localities. In Natal it was obtained at Camperdown, near Maritzburg, by Reid, and is common according to the Woodward's in the upper districts. Other localities are: Transvaal—Barberton (Rendall), Potchefstroom (Ayres); Bechuanaland—Palapye (Buckley); Rhodesia—Tati (Oates), Shongo river near Gwelo (Ayres), Sibanini (Holub), and Chiquaqua (Sowerby).

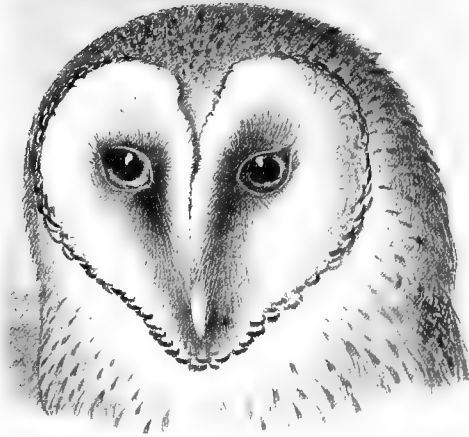


FIG. 80.—*Strix flammea*.

According to Andersson it is scarce throughout German southwest Africa, though recorded from Reheboth by Fleck; finally there is an example from Tete on the Zambesi, obtained by Kirk, now in the British Museum.

Habits.—The Barn Owl, as its name implies, is generally associated with outhouses and buildings and breeds in the roofs and lofts of most of the farmhouses in South Africa; in Mashonaland Marshall has found it occupying disused mining shafts and drives.

They are usually found in pairs, and prey chiefly on mice; the numerous pellets containing the rejected bones of these and other small rodents are often to be found in considerable quantities below their resting places; they also devour other small mammals, birds, and large insects, and are therefore of great value to the agriculturist. During the daytime they generally remain concealed, coming out in the dark of night to hunt their prey. The cry is not a hoot but a loud, somewhat weird, shriek, while a kind of snoring sound is emitted by both young and old. The Barn Owl makes no nest but lays its eggs in holes, in buildings or hollow trees, or even on the ground. These are laid and hatched at intervals of several days or weeks in Europe, nestlings being found alongside freshly laid eggs. In South Africa, according to Layard, the eggs are from two to four in number, oval, pure white, and not shiny, measuring about 1.7×1.25 .

492. *Strix capensis*. Grass Owl.

Strix capensis, *Smith, S. A. Quart. Journ.* ii, p. 317 (1834); *id. Illustr. Zool. S. Afr. Aves*, pl. 45 (1840); *Gurney, Ibis*, 1859, p. 242 (Natal); *Layard, B. S. Afr.* p. 44 (1867); *Buckley, Ibis*, 1874, p. 362; *Sharpe, ed. Layard's B. S. Afr.* pp. 81, 802 (1875-84); *id. Cat. B. M.* ii, p. 307 (1875); *Oates, Matabeleland*, p. 300 [Wakkerstroom district]; *Butler, Feilden, and Reid, Zool.* 1882, p. 205 [Newcastle]; *Shelley, B. Afr.* i, p. 141 (1896); *Woodward Bros. Natal B.* p. 159 (1899); *Reichenow, Vög. Afr.* i, p. 678 (1901).

Scelostrix capensis, *Gurney, Ibis*, 1868, p. 150; *Ayres, Ibis*, 1871, p. 150 [Potchefstroom].

Aluco punctata, *Shelley, Ibis*, 1875, p. 66 [Umgeni river].

Description. Adult female.—Above, very dark brown with a few small inconspicuous white spots at the tips of the feathers; wing-quills brown with lighter crossbands, which become buffy towards the base and white along the inner edge; the coverts along the radial edge of the wing are also buff; central tail-feathers like the back, outer ones with increasing amounts of white; facial disc pure white; a black spot in front of the eye, facial ruff surrounding the disc brown above, buffy-white with brown tips on the sides and below; lower surface white, slightly washed with buff on the breast, covered throughout with little rounded spots of dark brown; tarsal feathering becoming very thin on the lower half of the tarsus, toes quite bare.

Iris dusky or black; bill white, yellowish at base; legs and toes dirty yellow.

Length 15·5; wing 12·25; tail 4·55; culmen 1·10; tarsus 2·90.

A younger bird has the facial disc tinged with red, a stronger buffy wash on the under parts and marked traces of transverse bands on the tail.

Distribution.—The Grass Owl is rather a rare bird, found chiefly in the eastern and southern half of South Africa, and extending beyond our limits to Angola and Nyasaland.

The following are recorded localities: Cape Colony—Cape division (Smith and Layard), George division (Atmore), Knysna (Marais and S. A. Mus.); Natal—Ifafa (Woodward), Umgeni river, near Durban (Shelley), Richmond Road (Reid), Newcastle (Butler); Basutoland—Maseru (Bowker); Transvaal—Sandspruit in Wakkerstroom district (Oates), Potchefstroom (Ayres).

Habits.—This Owl is almost invariably found in the grass and rushes along streams or vleis; here during the day it sleeps on the ground and is sometimes put up by dogs; it appears to be nowhere plentiful. Mr. Atmore found a nest containing three fully fledged young birds in the Palmiet swamps at Blanco in the George district in May; no other information in regard to its breeding habits is available.

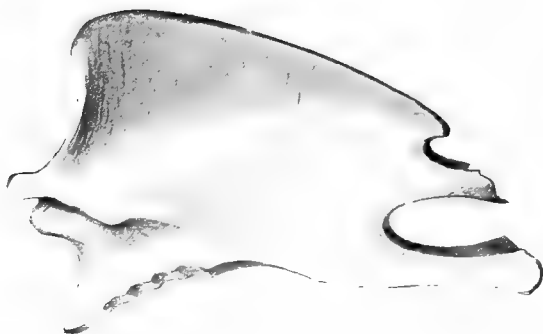


FIG. 81.—Sternum of *Bubo maculosus*, showing the double posterior notch. $\times \frac{1}{2}$.

Family II. BUBONIDÆ.

Skull short and comparatively broad; sternum with two deep notches on both sides posteriorly; furcula entirely free from the keel of the sternum; second joint of the third toe equal to the

basal one; claw of middle toe not pectinated (in South African genera).

This family contains the bulk of the genera of owls, and is sometimes divided into subfamilies, but the characters named for this purpose appear to be rather superficial except in the case of *Photodilus*, a Madagascar genus, which does not here concern us.

Genus I. **ASIO.**

Type.

Asio, *Briss. Orn.* i, p. 28 (1760) *A. otus*.

Bill moderate; cere not swollen, nostrils large ovals at the edge of the cere; facial disc very plainly marked out and extending as far below the eye as above; ear tufts present, but sometimes but very little developed; ear opening very large with an operculum; iris always yellow; wings long and pointed reaching or nearly reaching the end of the tail and nearly twice as long; tarsi feathered; toes sometimes feathered, sometimes bare, sometimes with bristles.

This genus is spread over the greater part of the world except the Australian region; two out of four African species are found within our limits.

Key of the Species.

- A. With large and conspicuous ear tufts; upper and lower surface streaked with black..... *A. leucotis*, p. 243.
- B. With very small ear tufts; no black streaks on the upper and lower surface *A. capensis*, p. 241.

493. **Asio capensis.** *Marsh Owl.*

Otus capensis, *Smith, S. Afr. Quart. Journ.* ii, p. 316 (1834); *id. Ill. Zool. S. Afr. Aves*, pl. 67 (1841); *Layard, B. S. Afr.* p. 43 (1867); *id. Ibis*, 1869, p. 71 [Bredasdorp]; *Buckley, Ibis*, 1874, p. 361; *Oakley, Trans. Philos. Soc.* ii, p. 46 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 45 (1882).

Phasmodoptynx capensis, *Gurney, Ibis*, 1862, p. 26 [Natal]; *Ayres, Ibis*, 1871, p. 148 [Potchefstroom]; *Gurney in Andersson's B. Damara-land*, p. 43 (1871).

Asio capensis, *Sharpe, ed. Layard's B. S. Afr.* pp. 78, 802 (1875-84); *id. Cat. B. M.* ii, p. 239 (1875); *Oates, Matabeleland*, p. 300 (1881); *Butler, Feilden, and Reid, Zool.* 1882, p. 205 [Newcastle]; *Shelley, Ibis*, 1882, p. 240 [Mashonaland]; *Fleck, Journ. Ornith.* 1894, p. 394; *Shelley, B. Afr.* i, p. 142 (1896); *Woodward Bros. Natal B.* p. 158 (1899); *Alexander, Ibis*, 1900, p. 432 [Zambesi].

Asio nisuellæ, *Reichenow, Vög. Afr.* i, p. 659 (1901).

Description. *Adult male.*—General colour above, including the wing-coverts, dark brown, with traces, especially on the wing-coverts, of paler vermiculations; wing-quills dark brown with very broad bars of fulvous, the inner primaries and outer secondaries tipped with whitish; tail-feathers pale fulvous with five transverse bars of brown; in the central feathers the brown extends to the tip of the feathers; a ring of black round the eye, rest of the facial disc fulvous-grey marked off by a darker line; lower surface of the body pale brown; the lower breast and flanks mottled with white,



FIG. 32.—*Asio capensis*. $\times \frac{9}{10}$.

the thighs, tarsi, and under tail-coverts pale fulvous and unspotted; the feathering of the tarsus extends to the basal joint of the toes and a line of bristles runs along the middle of these nearly to the claws.

Iris dark hazel; bill, toes and claws black and slaty-brown.

Length 14.75; wing 12.0; tail 6.5; tarsus 2.40; culmen 0.60.

The sexes resemble one another in size and plumage.

Distribution.—The Marsh Owl has a curious distribution, it is found in South Africa northwards to Angola on the west, and to British east Africa on the east; it reappears in Morocco and is

occasionally found in southern Spain. There is a closely allied if not identical owl in Madagascar.

In South Africa it is generally distributed throughout, though far more abundant on the eastern side, which is better watered and therefore more suitable to its habits.

The following are recorded localities: Cape Colony—Bredasdorp (Layard), King Williams Town (Trevelyan), Transkei where common (Oakley); Natal—Common throughout Maritzburg and Newcastle (Oates); Orange River Colony—Bloemfontein (Bt. Mus.) Roodeval and Vredefort Rd. (B. Hamilton); Transvaal—Lydenburg (Bt. Mus.), Potchefstroom (Ayres), Limpopo river (Eriksson in S. A. Mus.); Bechuanaland—Linokana near Mafeking (Holub); Mashonaland (Ayres); German south-west Africa—Rare (Andersson and Fleck); Portuguese east Africa—Senna (Alexander) and Shupanga (Kirk) on the Zambesi.

Habits.—These Owls are confined to swampy places where they conceal themselves among the rushes and long grass during the day. They are generally found in small parties of five and six individuals; when flushed they make short flights like a covey of partridges, settling down again almost immediately; though apparently flying well by day, and not minding the sunlight, yet they naturally appear more frequently at evening time when they search for their prey, which consists of frogs, lizards, swamp-mice and aquatic insects. The cry is a harsh screech not a hoot.

Ayres found these Owls breeding in the swamps near Potchefstroom; the nest merely consists of a slight cavity or depression in the ground, lined with a few dry rushes and hidden under a clump of reeds or long grass. The eggs, two to four in number, are pure white and slightly glossy, measuring about 1.6 × 1.4. Ayres found the male bird assisting in incubation.

Eriksson also found this Owl breeding on the Limpopo near its junction with the Marico during the months from February to April, and gives a similar account.

494. *Asio leucotis*. *White-faced Owl*.

Strix leucotis, *Temm. Pl. Col.* i, pl. 16 (1820).

Ephialtes leucotis, *Gurney, Ibis*, 1862, p. 26 [Natal]; *Layard, B. S. Afr.* p. 41 (1867); *Buckley, Ibis*, 1874, p. 362 [Serule]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 47 (1882).

Otus leucotis, *Gurney, Ibis*, 1868, p. 149.

Scops leucotis, *Ayres, Ibis*, 1871, p. 149 [Potchefstroom]; *Gurney in Andersson's B. Damaraland*, p. 40 (1872); *Sharpe, ed. Layard's*

B. S. Afr. pp. 74, 801 (1875-84); *id. Cat. B. M.* ii, p. 97 (1875); *Ayres, Ibis*, 1877, p. 341 [Potchefstroom]; *Oates, Matabeleland*, p. 299 (1881); *Shelley, B. Afr.* i, p. 143 (1896); *Marshall, Ibis*, 1900, p. 270 [nr. Salisbury]; *Alexander, Ibis*, 1900, p. 433 [Chicowa on the Zambesi].

Pisorhina leucotis, Fleck, Journ. Ornith. 1894, p. 394.

Asio leucotis, Reichenow, Vög. Afr. i, p. 661 (1901).

Description. Adult male.—General colour above, grey narrowly mottled and vermiculated with darker; crown of the head washed with black; back and wing-coverts streaked with the same colour; a row of white spots along the outer scapulars; wing-quills and tail-feathers grey like the back, banded with darker; facial disc white with a greyish patch below the eye bounded behind by a strongly-marked black margin; the feathers of the ear tufts are also black on the outer web; below, like the back, but the vermiculations more barlike, becoming white on the abdomen and under tail-coverts, all with longitudinal narrow streaks of black; tarsi dirty white with a few small black spots, the feathering extending almost to the tips of the toes.

Iris orange-yellow; bill bluish-horn; toes greyish.

Length 12·25; wing 7·75; tail 3·80; tarsus 1·60; culmen 0·80; ear tufts 1·75.

Distribution.—The White-faced Owl is found all over Africa south of the Sahara, from Gambia, Kordofan and Somaliland southwards. Within our limits it does not extend far south of the Orange river, on the banks of which it was procured by Bradshaw. In Natal it is not uncommon near the coast. In the Transvaal, Rhodesia and German south-west Africa it appears to be fairly abundant, as the following list of localities shows: Natal—Near Durban (Millar); Transvaal—Komatipoort and Oliphant river in Lydenburg (Francis), Potchefstroom and Limpopo river (Ayres); Bechuanaland—Mahura's country (Arnot), Serule in Bamangwato (Buckley), near Lake Ngami (Andersson and Fleck); Rhodesia—Umvungu river near Gwelo (Oates), Pandamatenka (Holub), near Salisbury (Marshall); German south-west Africa; common in Damara-land, rarer in Great Namaqualand (Andersson), Reheboth (Fleck).

Habits.—According to Andersson this Owl is always found in pairs, and though a thoroughly nocturnal bird can see very well during the day; its food consists chiefly of insects and grasshoppers, but it also preys on rats and mice, as their remains have been found in stomachs examined by Oates and Ayres.

This little Owl seems to breed all the year round. Ayres found a nest in Natal in June, Eriksson in the north-west Transvaal in March, and Andersson in September, October, and November in Damaraland. It often adopts the nest of some other bird; one found by Andersson was in a hollow in one of the mass of nests constructed by the Buffalo Weaver Bird (*Textor erythrorhynchus*). When it builds its own nest it makes a structure of a few sticks put together so loosely that the eggs can be seen through from below. These are pure white, two or three in number, very broad and rounded equally at both ends. Mr. Millar writes that this Owl has nested in his garden for several years, building its own edifice, but apparently not difficult to please, as its architecture is of the crudest, the nest consisting of a few leaves placed in the centre of a large tree where three boughs branch out about twelve feet above the ground. Two eggs sent by Mr. Millar to the South African Museum are smooth, white, somewhat rounded ovals, measuring 1.6×1.3 .

Genus II. SYRNIUM.

Type.

Syrnium, *Savigny, Descr. Egypte, Ois.* pp. 9, 51 (1810)... *S. aluco*.

Bill moderate, cere not swollen, nostrils oval at the margin of the cere; facial disc not so well defined as in *Asio*, but extending equally above and below the eye; no ear tufts; ear opening with an operculum; wing somewhat rounded, extending nearly to the tip of the tail, which is more than half the length of the wing; tarsi feathered to the base of the toes, which (in the South African species), are covered only by a few bristles; irides always brown.

This genus is found over the greater part of the world except the Australian region and Madagascar. There are only two African species, one of which is found in South Africa.

495. **Syrnium woodfordi.** *Woodford's Owl.*

Noctua woodfordi, *Smith, S. Afr. Quart. Journ.* ii, p. 312 (1834).

Athene woodfordi, *Smith, Illustr. Zool. S. Afr. Aves*, pl. 71 (1842);

Gurney, Ibis, 1859, p. 242, 1862, p. 37 [Natal].

Strix woodfordi, *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 47 (1858) [Knysna].

Syrnium woodfordi, *Layard, B. S. Afr.* p. 42 (1867); *Sharpe, ed. Layard's B. S. Afr.* pp. 76, 801 (1875-84); *id. Cat. B. M.* ii, p. 267

(1875); *Barratt, Ibis*, 1876, p. 197 [Potchefstroom]; *Seebohm, Ibis*, 1887, p. 351; *Shelley, B. Afr.* i, p. 142 (1896); *Sowerby, Ibis*, 1898, p. 575 [Fort Chiquaqua]; *Woodward Bros. Natal B.* p. 158 (1899); *Alexander, Ibis*, 1900, p. 432 [Zumbo]; *Reichenow, Vög. Afr.* i, p. 668 (1901).

“Ibengwana” of the Zulus (Woodward).

Description. *Adult male.*—General colour above, dark brown, almost black, with small triangular white spots, which on the lower back and upper tail-coverts show a tendency to widen out into bars; outer webs of the outer scapulars and greater wing-coverts barred white and brown; quills dark brown barred and tipped with paler

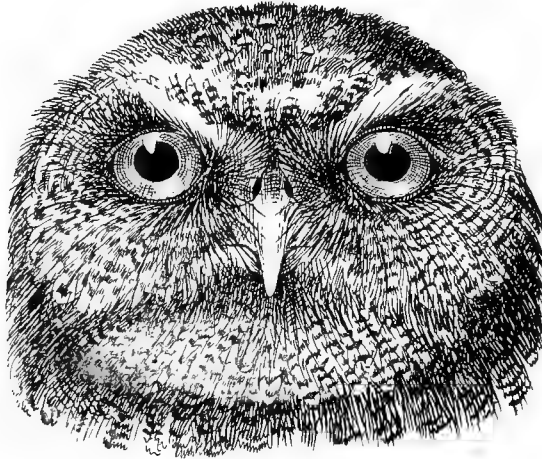


FIG. 83.—*Synnium woodfordi*. $\times \frac{9}{10}$.

brown, tail also dark brown with five transverse bars and a tip of paler; facial disc grey with a black ring round the eye; below, white barred with brown, the white predominating on the abdomen and tail-coverts, the brown on the breast; tarsi dirty white speckled with black, the toes as a rule bare of feathers and bristles.

Iris brown, bill yellow, toes dirty yellow.

Length 14·5; wing 9·5; tail 5·40; culmen 0·75; tarsus 1·80.

The sexes are alike in dimensions and plumage.

Distribution.—Woodford's Owl is rather a rare bird and is only found in or about forest and thick bush. It is not uncommon at Knysna, where it has been obtained by Victorin, Marais, and several

other collectors; it has also been recorded from near Port Elizabeth, and Mr. Shortridge has recently sent an example to the South African Museum from Port St. John's. In Natal it is not uncommon in the bush near the sea coast. There is an example in the British Museum from Potchefstroom; Sowerby once met with it at Fort Chiquaqua in Mashonaland and Alexander records it from Zumbo on the Zambesi. Beyond our limits it is spread over Nyasaland, German and British east Africa as far north as Nairobi and Mombasa.

Habits.—The Woodward's give the following account: "We have found this Owl very common in the coast bush. It is fond of the dark recesses of the woods, where its cheerful hooting notes are constantly heard during the clear winter nights. Its diet does not consist only of mice, as we have taken grasshoppers and beetles from its stomach."

To Mr. Millar I am indebted for the following note on its breeding habits. "On two occasions the nest of this Owl has come under my observation. This was near Durban, in the stump of a dead tree about ten feet from the ground, which had been hollowed out about eighteen inches downwards; on each occasion there was only one egg hard set with the bird sitting in the nest. The first was taken on September 24, 1899, the second on October 21, 1900. The nest had the appearance of being scooped out, and with the exception of a few pieces of dead wood was entirely bare without any leaves." The eggs are white measuring 1.75 × 1.40.

Genus III. **BUBO.**

Type.

Bubo, *Duméril, Zool. Anal.* p. 34 (1806)..... *B. ignarus.*

Bill stout, hooked and rounded, cere not swollen; nostrils oval at the margin of the cere, ear tufts large and well developed; facial disc not very strongly marked and not extending so far below as above the eye; wings somewhat rounded and falling short of the tail by more than the length of the middle toe, the third and fourth quills the longest and sub-equal; tarsi and toes feathered almost to the claws (in all South African species).

This genus contains some twenty-five owls of large size, distributed all over the world except in the Australian region. Three out of ten African species are found within our limits.

Key of the Species.

- A. Bill black; above, black or brown spotted with ochre and white.
- a. Larger, wing 14·15; ear-coverts greyish with a few darker shaft marks, not transversely banded *B. capensis*, p. 248.
- b. Smaller, wing 12·13; ear-coverts greyish transversely barred with black *B. maculosus*, p. 249.
- B. Bill pale ash-y-horn; large, wing 17·18; above, brown vermiculated with white *B. lacteus*, p. 252.

496. **Bubo capensis.** *Cape Eagle Owl.*

Bubo capensis, *Smith, S. Afr. Quart. Journ.* ii, p. 317 (1834); *id. Illustr. Zool. S. Afr. Aves*, pl. 70 (1842); *Layard, B. S. Afr.* p. 39 (1867); *id. Ibis*, 1869, p. 71 [Buffelsjagts river]; *Sharpe, ed. Layard's B. S. Afr.* pp. 70, 801 (1875); *id. Cat. B. M.* ii, p. 27 (1875); *Butler, Feilden, and Reid, Zool.* 1882, p. 204 [Newcastle]; *Shelley, B. Afr.* i, p. 143 (1896); *Woodward Bros. Natal B.* p. 156 (1899); *Reichenow, Vög. Afr.* i, p. 653 (1901).

Description. *Adult female.*—Above, brown spotted and mottled with orange-tawny, wing-coverts with white spots as well; quills brown with transverse bands of tawny which become almost white on the inner webs; tail also banded dark brown and tawny; facial disc white with black shafts to the decomposed feathers, ear-coverts darker, but never transversely banded, bounded on either side by a strongly-marked black band and below by a row of tawny feathers centrally streaked with black; a white spot of soft downy feathers on the upper breast; rest of the lower surface mottled with black, white, and tawny, the distribution becoming bandlike on the flanks; legs, which are feathered to the claws, pale fulvous to white and not mottled or spotted; under tail-coverts white and a few bars of dark brown, a large and conspicuous corn about 1·0 long at the base of the tarso-metatarsus.

Iris orange-yellow; bill and cere black; claws light horn.

Length in flesh 19·5; wing 14·5; tail 7·25; tarsus 2·75; culmen 1·20; ear tufts 2·40.

Distribution.—The Cape Eagle Owl appears to be confined to the southern portion of South Africa. It has not hitherto been met with beyond the limits of the Colony and Natal. It is not uncommon in the neighbourhood of Cape Town, whence it was first described by Smith; Layard obtained eggs on the Berg river;

Atmore on the Buffelsjagts river in the Swellendam division, and the South African Museum possesses an example from Coernay in the Alexandra division. In Natal it is widespread, having been obtained near Newcastle by Feilden in June and in south Natal and north Zululand by the Woodwards.

A closely allied, though distinct species (*B. ascalaphus*) is found in Abyssinia and north-east Africa.

Habits.—This Eagle Owl is, to a certain extent at any rate, diurnal in its habits, as Layard shot one during the day in bright sunlight after a long chase across the Cape flats, and the Woodwards too state that it hunts over the open veld near woods. It preys on small animals and birds, even attacking, according to the Woodwards, the Springhaas (*Pedetes caffer*). The nest, which is generally placed on an exposed bank near a river, has been found and described by Layard, Atmore, and the Woodwards; it is like that of a hawk, made up of sticks, while the numerous pellets cast by the old birds make a soft bed for the eggs and young; the eggs are from two to four in number, pure white, smooth and not shiny, rounded at both ends and measuring about 2.0 × 1.75. Layard found a nest on the Berg river on September 21; the nest taken by Atmore was in a mimosa tree on the Buffelsjagts river; it contained three eggs and had been previously used by a crow.

497. *Bubo maculosus*. *Spotted Eagle Owl*.

- Le Choucouhou, *Levaillant, Ois. d'Afr.* i, p. 157, pl. 39 (1799).
Strix maculosa, *Vicill. N. Dict. Hist. Nat.* vii, p. 44 (1817); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 47 (1858) [Cape and Knysna].
Strix africana, *Temm. Pl. Col.* p. 50 (1824).
Otus maculosa, *Smith, S. A. Quart. Journ.* ii, p. 315 (1834).
Bubo maculosus, *Gurney, Ibis*, 1859, p. 242 [Natal]; *Layard, B. S. Afr.* p. 40 (1867); *Pelzeln, Novara Reise, Vögel*, p. 26, pl. vi, fig. 1 (egg) (1869); *Ayres, Ibis*, 1869, p. 289 [Transvaal]; *Gurney, Andersson's B. Damaraland*, p. 42 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 73, 801 (1875-84); *id. Cat. B. M.* ii, p. 31 (1875); *Barratt, Ibis*, 1876, p. 196; *Ayres, Ibis*, 1879, p. 287 [Rustenburg]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 43 (1882); *Butler, Feilden, and Reid, Zool.* 1882, p. 204 [Natal]; *Fleck, Journ. Ornith.* 1894, p. 394 [Reheboth]; *Shelley, B. Afr.* i, p. 143; *Rendall, Ibis*, 1896, p. 166 [Barberton]; *Sowerby, Ibis*, 1898, p. 575 [Chiquaquua]; *Woodward Bros. Natal Birds*, p. 155 (1899); *Marshall, Ibis*, 1900, p. 260 [Salisbury dist.]; *Reichenow, Vog. Afr.* i, p. 654 (1901); *Harris, Essays and Photogr.* p. 155, pl. xlii (young birds) (1901).

“Isikuluhulu” of Amaxosa (Stanford); “Isikora” of Natal Zulus (Woodward); both these names are also applied to other species of owls.

Description. *Adult male.*—General colour above, mottled and vermiculated dark brown, pale fulvous and white, darkest on the head; quills dark brown with pale fulvous cross-bands, becoming white on the inner webs; tail-feathers the same all but the two centre ones which are tipped with white; feathers of the lores and chin and a patch on the throat white; ear-coverts greyish barred with black with a transverse line of black behind them forming the



FIG. 84.—*Bubo maculosus*.

boundary of the facial disc; rest of the lower surface including the thighs and legs more or less regularly transversely barred with dark brown and white; toes, which are feathered to the claws, dirty white. A small corn at the base of the tarso-metatarsus.

Iris bright yellow to orange; bill, cere and claws black.

Length about 20·3; wing 12·75; tail 7·5; tarsus 2·50; culmen without cere 1·0; ear tufts about 2·0.

The female does not differ from the male either in size or marking to any appreciable extent.

Distribution.—The Spotted Eagle Owl is spread all over the southern half of the continent, ranging as far north as the Congo on the west, and Ugogo and Lamu in east Africa. It is replaced in west and north-east Africa by a closely-allied sub-species.

In South Africa this is almost everywhere the commonest owl, and is recorded from nearly all the districts which have been worked over.

The following are some of the principal localities: Cape Colony—Cape division (Victorin, Zelebor, and S. A. Mus.), Stellenbosch, Ceres, Worcester, Middelburg, Graaff Reinet, Peddie, Kimberley, Upington on the Orange river (S. A. Mus.), near Aliwal North (Whitehead), Port Elizabeth and East London (Rickard); Natal—common (Woodward), Richmond road and Newcastle (Butler); Orange River Colony—Bloemfontein (Barratt), Vredefort road (B. Hamilton); Transvaal—Potchefstroom and Rustenburg (Barratt), Barberton (Rendall); Bechuanaland—Notuani river (Holub); Rhodesia—Salisbury district, common (Marshall); German south-west Africa—somewhat rare at Rehoboth (Fleck).

Habits.—The Spotted Eagle Owl is far the commonest owl in South Africa, it is found everywhere and in all sorts of districts, in the forests and bushland, on the open treeless plains and in wild as well as cultivated areas. Layard and others believe it to be partially migratory, as parties of from eight to ten individuals have been observed consorting with one another, but they are also often found in pairs. Their cry is “hoo hoo” in two clear notes, and they also make a cracking sound with their bills, which is very characteristic, and given vent to when disturbed or wounded.

They prey on mice, moles, rats, and frogs, snakes, and insects of various kinds, and according to the Woodwards will, when opportunity occurs, kill pigeons. Small birds often mob them when they appear during the day, the leaders being the Drongos and the Bulbuls.

They usually nest on the ground in a slight depression, with little or no attempt at architecture. The eggs are rounded, smooth and white, measuring about 2.0×1.65 ; in western Cape Colony they are usually two in number and laid in October or November, but in the upper part of Natal Butler found three eggs which were incubated on June 30.

Dr. Stark gives the following account of the bird:—"Hoetjes Bay (*i.e.*, Saldana Bay in the western part of the Cape Colony), October 8, 1896. This morning as I was climbing the side of a rocky kopje about a quarter of a mile from the village, a large horned owl flew from just in front of me, leaving exposed two eggs lying in a scratching on the earth on a shelf of rock sheltered by low weeds and bushes. She flew a short distance and sat fully exposed on a rock with horns erect and with the brilliant yellow irides conspicuous. I had previously seen another *Bubo* on this side of the hill and heard it hoot one evening—a rather mellow "hou hou," which reminded me of the noise made by a baboon. These owls are very common in the neighbourhood, and I have often startled them from their nests under bushes on the bush-covered plains and sides of the hills. Next morning when I returned to the nest I found both the eggs gone, one lay broken about ten feet off under a rock; the nest was a flat space of ground about a foot across, with a few leaves and bits of broken dead stick strewn promiscuously about it.

498. ***Bubo lacteus*.** *Verreaux's Eagle Owl.*

- Strix lactea*, *Temm. Pl. Col.* ii, pl. iv (1820).
Bubo lacteus, *Smith, S. A. Quart. Journ.* ii, p. 317 (1834); *Gurney. Ibis*, 1863, p. 321, 1868, p. 50 [Natal]; *Sharpe, ed. Layard's B. S. Afr.* pp. 71, 801 (1875-84); *id. Cat. B. M.* ii, p. 33 (1875); *Oates, Matabeleland*, p. 299 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 40 (1882); *Gurney, Proc. Zool. Soc.* 1884, p. 560; *Rendall, Ibis*, 1896, p. 166 [Barberton]; *Shelley, B. Afr.* i, p. 144 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 414, 495 [Zululand]; *Woodward Bros. Natal B.* p. 156 (1899); *Marshall, Ibis*, 1900, p. 260 [Mashonaland]; *Woodward Bros., Ibis*, 1900, p. 519 [St. Lucia Lake]; *Reichenow Vög. Afr.* i, p. 650 (1901).
Bubo verreauxi, *Bp. Consp.* i, p. 49 (1850); *Layard, B. S. Afr.* p. 38 (1867); *Buckley, Ibis*, 1874, p. 362 [Limpopo]; *Fleck, Journ. Ornith.* 1894, p. 394.
Huhua verreauxi, *Gurney, Ibis*, 1868, p. 147; *id. in Andersson's B. Damaraland*, p. 41 (1872).
Huhua lactea, *W. Ayres, Ibis*, 1887, p. 48 [eastern Transvaal].

Description. *Adult.*—Above, dark grey, finely mottled with white, the markings on the crown forming a fine transverse banding; wings with some of the coverts edged with white, forming an irregular longitudinal bar; quills dark brown with paler cross-bands, vermiculated on the outer web, becoming pure white on the

inner; tail-feathers also banded in the same fashion; bristles of the lores black with white bases, rest of the facial disc white, defined on either side by a marked black band; below, throughout finely vermiculated with brown and white, darkest on the breast, the white predominating on the thighs and under tail-coverts; no trace of a corn at the base of the tarso-metatarsus.

Iris dark hazel; bill pale ashy-horn; cere bluish-grey, upper eyelid rose-pink; claws dusky black.

Length about 28·0; wing 17·25; tail 9·5; tarsus 3·0; culmen without cere 1·5.

Distribution.—This, the largest of our Eagle Owls, is spread over the greater part of Africa south of Senegambia and Abyssinia, though not hitherto noticed in the west African forest region. Throughout South Africa this fine bird seems to be universally distributed though nowhere common; it appears to be most frequently met with in the western and dryer districts.

The following are localities: Cape Colony—Stellenbosch division (S.A. Mus.), Blanco in George, Meiring's Poort in Oudtshoorn, Beaufort west division and Colesberg (Layard), near Douglas in Griqualand west (Miss Orpen in S. A. Mus.); Natal—rare (Gurney and Woodward), Ulundi and St. Lucia Lake in Zululand (Woodward); Transvaal—Barberton (Rendall), along the eastern border of Zoutspansberg (W. Ayres), Limpopo river (Buckley); Bechuanaland—Lake regions (Andersson); Rhodesia—Kwesi river between Tati and Bulawayo (Oates), Umfuli river (Marshall); German south-west Africa—throughout (Andersson), Reheboth, Kalahari, and Okavango (Fleck).

Habits.—Verreaux's Eagle Owl is usually found in pairs in wooded kloofs near streams and rivers; during the day time it retires to the deepest shades of a high and thick tree and remains dozing, though conscious if danger threatens. At night it sallies forth in search of its prey, which consists of guinea fowls and other birds, small mammals up to the size of hares, and even large insects. It is specially destructive to domestic fowls and will soon clear out a poultry yard. The cry which is sometimes uttered during the daytime but is more usually heard during the night, is a hollow sepulchral hoot and reminded Layard of the call note of the leopard.

Eriksson gives the following note of its nesting habits:—"Nest in a tree made of twigs, very strong, lined with feathers, containing two young ones and one egg, found at Olongo west of Gambos in

Angola, on July 22, 1882. Another nest was a large flattish structure composed of sticks and twigs finely put together without any lining of softer materials; it was situated in the highest branches of a large dry tree; the eggs, two in number, were pure white, round at both ends and slightly incubated; this nest was found on the Limpopo river near its junction with the Marico on August 8."

The egg from the former nest, now in the South African Museum, is smooth, rounded and white; it measures 2.35 × 2.0.

Genus IV. **SCOPS.**

Type.

Scops, *Sav. (nec Moehr. 1752) Decr. de l'Egypte*,
pp. 9, 47 (1810) *P. scops.*
Pisorhina, *Kaup, Isis*, 1848, p. 769 *P. menadensis.*

Bill small and weak, not much hooked, cere slightly swollen, the nostrils round, at the margin of the cere; facial disc not very distinctly marked, ear tufts well developed; wings long, reaching to the end of the tail or only falling short of it by very little; tail short, about half the length of the wing; tarsi feathered to the toe joints but the toes themselves free from feathers (in the South African species).

This genus, containing a large number of owls of small size, is found all over the world except in Australia. Only one species closely allied to that of central and southern Europe (*S. giu*) is found within our limits. The White-faced Owl usually placed here is better located in the genus *Asio*.

Scops is the name usually used for these little owls; it has recently been rejected by some authors as it was previously used by Moehring (*Avium Genera*, p. 73, 1752), for another group of birds, but Moehring was not a binominalist and his genera are not generally recognised.

499. **Scops capensis.** *Cape Scops Owl.*

Le Scops, *Levaillant, Ois. d'Afr. i*, p. 162 (1799).
Scops capensis, *Smith, S. Afr. Quart. Journ. ii*, p. 315 (1834); *Gurney in Andersson's B. Damaraland*, p. 38 (1872); *Sharpe, ed. Layard's B. S. Afr.* pp. 75, 801 (1875-84); *id. Cat. B. M.* ii, p. 52, pl. iii, fig. 1 (1875); *Butler, Feilden, and Reid, Zool.* 1882, p. 204 [Newcastle]; *Ayres, Ibis*, 1885, p. 342 [Rustenburg]; *Shelley, B. Afr. i*, p. 143

(1896); *Sharpe, Ibis*, 1897, p. 496 [Zululand]; *Woodward Bros. Natal B.* p. 157 (1899).

Ephialtes capensis, *Gurney, Ibis*, 1859, p. 242 [Natal]; *id. Ibis*, 1868, p. 149; *Holub & Pelzeln, Orn. Süd-Afr.* p. 47 (1882).

Ephialtes senegalensis, *Layard, B. S. Afr.* p. 41 (1867).

Pisorhina capensis, *Fleck, Journ. Ornith.* 1894, p. 394; *Reichenow, Vog. Afr. i.* p. 666 (1901).

Description. *Adult female.*—General colour above, dark grey streaked and mottled with black, and spotted especially on the scapulars and wing-coverts with white, also with traces here and there of a rufous wash; quills greyish-black spotted on the outer web only with white; tail mottled black and pale rufous; lores and facial disc iron-grey, bounded behind by an indistinct line with



FIG. 85.—*Scops capensis*. $\times \frac{1}{4}$.

rufous edging; below, lighter than the back, becoming almost white on the abdomen and lower tail-coverts, with black streaks and mottlings often with a rufous edging; feathering of the tarsus falling short of the toe joints.

Iris bright yellow; bill and toes bluish-horn.

Length 7·0; wing 5·0; tail 2·10; tarsus 1·0; culmen 0·4.

A male is slightly larger in size, wing 5·15; tail 2·30.

Distribution.—The Cape Scops Owl is closely allied to the European species, only differing in its slightly smaller size and in the tarsus not being feathered quite up to the toe joints. It is found over the greater part of Africa, from Abyssinia southwards

to Cape Colony, but appears to be very rare or absent in the forest districts of West Africa.

Within our limits it is widely distributed, though apparently very rarely met with, probably on account of its strictly nocturnal habits and small size.

The following are localities: Cape Colony—Swellendam (S. A. Mus.); Natal—Near Newcastle (Butler), Ulundi in Zululand (Woodward); Transvaal—Sabi river, common (Francis in S. A. Mus.), Rustenburg (Ayres), Potchefstroom (S. A. Mus.); Bechuanaland—Near Lake Ngami (Eriksson in S. A. Mus.); Rhodesia—near Sibanini in west Matabeleland (Holub); German south-west Africa—Damaraland, rare (Andersson), Reheboth (Fleck), Ochimbora (Eriksson in S. A. Mus.).

Habits.—But few observations have been made on the habits of this little Owl. It is seldom if ever seen during the day and probably escapes observation at night owing to its small size. It has a low melancholy and monotonous note, "kroo kroo," heard soon after sunset or later during the night according to Ayres, while one met with by Andersson made a noise something like the tapping of a woodpecker, which was probably caused by the opening and shutting of the beak. This species appears to confine itself to insect food, beetles and moths having been found in the stomachs of individuals examined by Ayres and Francis.

Genus V. **GLAUCIDIUM.**

Type.

Glaucidium, *Boie, Isis*, 1826, p. 970..... *G. passerinum*.

Bill small, cere inflated and pea-shaped, within which are placed the nostrils which are small and round; facial disc hardly marked out from the surrounding area; no ear tufts; wings short and rounded falling short of the tip of the tail by at least the length of the tarsus; first primary shorter than the secondaries; tarsi feathered to the base of the toes, which are themselves covered with short bristles.

This genus, containing about thirty species of small Owls, is spread nearly all over the world except in the Australian region. Two species are found in South Africa.

Key of the Species.

- A. Smaller, wing under 5·0 ; centre of back and tail brown with pearly-white spots..... *G. perlatum*, p. 257.
 B. Larger, wing over 5·0 ; centre of back and tail barred with brown and ochre-yellow. *G. capense*, p. 259.

500. *Glaucidium perlatum*. *Pearl-spotted Owl.*

La Chevêchette perlée, *Levaill. Ois. d'Afr.* vi, p. 120, pl. 284 (1808).

Strix perlata, *Vieill. N. Dict. d'Hist. Nat.* vii, p. 26 (1817).

Noctua perlata, *Smith, S. Afr. Quart. Journ.* ii, p. 313 (1834).

Strix licua, *Licht. Verz. Säugeth. u. Vög. Kaffernl.* p. 12 (1842).

Athene licua, *Layard, B. S. Afr.* p. 38 (1867).

Athene perlata, *Gurney in Andersson's B. Damaraland*, p. 37 (1872); *Ayres, Ibis*, 1871, p. 149 [Limpopo].

Carine perlata, *Bulkley, Ibis*, 1874, p. 361 [Tati]; *Sharpe, ed. Layard's B. S. Afr.* pp. 77, 802 (1874-85); *Fleck, J. Ornith.* 1894, p. 394; *Rendall, Ibis*, 1896, p. 167.

Glaucidium perlatum, *Sharpe, Cat. B. M.* ii, p. 209 (1875); *Ayres, Ibis*, 1879, p. 287 [Rustenburg]; *Oates, Matabeleland*, p. 300 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 40 (1882); *Shelley, Ibis*, 1882, p. 239 [Umfuli river]; *W. Ayres, Ibis*, 1887, p. 49 [Lehtaba river]; *Shelley, B. Afr.* i, p. 142 (1896); *Woodward Bros. and Sharpe, Ibis*, 1897, pp. 414, 496; *Woodward Bros. Natal B.* p. 157 (1899); *Marshall, Ibis*, 1900, p. 260 [Salisbury]; *Alexander, ibid.* p. 432 [Zambesi Valley]; *Reichenow, Vög. Afr.* i, p. 674 (1901).

"Mundugulu" of Zulus (Woodward) and of Matabele (Ayres).

Description. *Adult male.*—General colour above, pale-brown, covered on the crown, back and wing-coverts with rounded black-edged spots of white; along the scapulars the spots are larger, forming a longitudinal line; round the hind neck an irregular collar of white feathers slightly mottled with dark-brown and washed towards the tip with rufous; wing-quills brown, spotted with white merging into rufous on both the inner and outer webs; tail-feathers dark-brown with a row of four darker-edged white spots on either web; facial disc not well defined, greyish-white; no ear tufts; below, chin and lower throat white divided by a patch of brown; rest of the lower surface mottled-brown and white, the former predominating on the breast, the latter on the abdomen, which with the under tail-coverts is almost pure white; tarsi, feathered to the basal joint of the toes, white spotted with brown; toes covered with a few scattered bristles hardly concealing them.

Iris bright yellow; bill greenish-yellow; toes yellowish; claws pale with dusky tips.

Length about 7·0; wing 4·10; tail 2·75; tarsus 0·95; culmen 0·55.

The female resembles the male in size and coloration. The young bird has no white spots on the head and back; the white nuchal collar is without the rufous edging, and the white on the thighs and throat is washed with rufous.

Distribution.—The Pearl-spotted Owl is found over Africa south of the Sahara from Gambia, Abyssinia, and Somaliland southwards in suitable localities, but it does not occur in the great equatorial forests of west Africa.

Within our limits it does not seem to be found south of the Orange river or in Natal proper, but north of this is everywhere abundant up to the Zambesi.

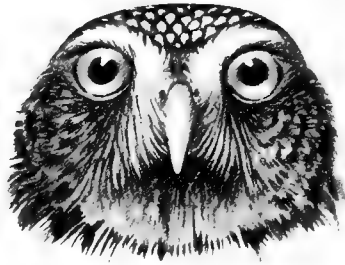


FIG. 86.—*Glaucidium perlatum*. × 15.

The following are the chief recorded localities: Cape Colony—Orange river near Upington (S. A. Mus.), north of Colesberg (Ortlepp), Vaal river in Griqualand West (Atmore); Zululand—Ulundi and Black Umfolosi rivers (Woodward); Transvaal—Sabi river, and Komatipoort in Lydenburg (Francis in S. A. Mus.), Lehtaba river drift in Zoutspansberg (W. Ayres), Rustenburg (Ayres); Bechuanaland—Kanye (Exton); Rhodesia—Tati (Buckley and Oates), Umfuli river (Ayres), near Salisbury (Marshall); German south-west Africa—common throughout (Andersson); Zambesi valley, common (Alexander).

Habits.—This little Bird is common everywhere along the rivers of the bush- and thorn-countries; it is at least partially diurnal in its habits and may be often seen in bright sun-light. It is usually

found in pairs and during the heat of the day sits perched in the shade of a thick tree, whence it flies off when disturbed with a dipping flight like that of a thrush. Its food consists chiefly of insects, such as grasshoppers and even termites, but it occasionally catches mice and lizards. This Owl does not hoot, but has a peculiar whistle compared by Ayres to that of the Golden Cuckoo and frequently heard in the evening and early morning. It is often mobbed by small birds when detected during the day time.

Although many naturalists and collectors have obtained and observed this bird, no one, so far as I am aware, has yet described its nesting habits or its eggs.

501. *Glaucidium capense*. *Barred Owl*.

Noctua capensis, *Smith, S. Afr. Quart. Journ.* ii, p. 313 (1834).

Athene capensis, *Smith, Ill. Zool. S. Afr. Aves*, pl. 33 (1839); *Layard, B. S. Afr.* p. 37 (1867).

Tænioglaux capensis, *Gurney, Ibis*, 1868, p. 147; *id. in Andersson's B. Damaraland*, p. 38 (1872); *W. Ayres, Ibis*, 1887, p. 50 [Zoutspansberg].

Carine capensis, *Sharpe, ed. Layard's B. S. Afr.* pp. 77, 802, pl. 3 (1875-84).

Glaucidium capense, *Sharpe, Cat. B. M.* ii, p. 223 (1875); *Shelley, Ibis*, 1882, p. 239 [Umfuli river]; *id. B. Afr.* i, p. 142 (1896); *W. L. Sclater, Ibis*, 1899, p. 286 [Inhambane]; *Alexander, Ibis*, 1900, p. 433 [Zambesi Valley]; *Reichenow, Vög. Afr.* i, p. 672 (1901).

Description. Adult male.—General colour above, brown, the crown and nape finely barred with white, the back and wings more broadly with pale rufous which also forms a wash all over the back; outer webs of the outer scapulars white, forming a longitudinal band on either side; wing-quills brown, barred with pale rufous with a few white spots on the coverts, inner primaries and secondaries; tail with narrow transverse bands of brown and pale rufous; a white eyebrow; lores and ear-coverts gray, chin and lower throat white, separated by a brown irregular band; rest of the under surface white, the breast banded, the abdomen spotted with brown; tarsi feathered to the base of the toes, dirty white; toes sparsely covered with coarse bristles.

Iris bright yellow; bill bluish-horn; toes pale yellow.

Length about 9.75; wing 5.30; tail 3.40; culmen 0.60; tarsus 1.20.

The sexes resemble one another in size and plumage.

Distribution.—East and south Africa from about the latitude of Zanzibar southwards. A rare bird in South Africa. The type is said by Smith to have been obtained in a forest district of the eastern province of Cape Colony, but I have not heard of the occurrence of this Owl south of the Orange river since. It is noted from the Vaal river in Griqualand West by Ortlepp; in the Transvaal from the Oliphant river in Zoutspansberg by W. Ayres. In Rhodesia it was obtained by Bradshaw on the Chobe river and by Ayres on the Umfuli; Andersson had an example from the Cunene. In Portuguese east Africa Alexander obtained several specimens between Tete and Chishombe on the Zambesi, and Francis one at Inhambane.

Habits.—Very little is known of the habits of this rare Owl. Ayres states that though rarely seen by daylight it was often heard at night on the Umfuli river, but that even on moonlight nights and guided by its soft “kro kro,” it was difficult to see and shoot. He found insects in the crop, while Ortlepp found the bones of mice.

Genus VI. SCOTOPELIA.

Type.

Scotopelia, *Bp. Consp. i*, p. 4 (1850) S. peli.

Owls of large size without any ear tufts; tarsi naked throughout the great part of their extent; covered with small rounded scales; the soles of the toes covered with sharp pointed spicules. Three species of this purely African genus have been described; one of these alone reaches our limits.

502. **Scotopelia peli.** *Pel's Fishing Owl.*

Scotopelia peli, *Bp. Consp. i*, p. 44 (1850); *Gurney, Ibis*, 1859, p. 445, pl. 15; *Kirk, Ibis*, 1864, p. 317 [Zambesi]; *Sharpe, ed. Layard's B. S. Afr.* pp. 69, 801 (1875-84); *id. Cat. B. M.* ii, p. 10 (1875); *Shelley, Ibis*, 1894, p. 465; *id. B. Afr. i*, p. 144 (1896); *Alexander, Ibis*, 1900, p. 434 [Zambesi]; *Reichenow, Vög. Afr. i*, p. 648 (1901).

Description. *Adult.*—Above, including the wings and tail rufous-bay, with numerous black cross bars, most of the feathers of the head and neck with black terminal spots only; sides of the face and lower surface ochreous-yellow with distinct longitudinal

streaks of black becoming rather more cordiform in shape on the flanks.

Iris dark brown; bill dark bluish-horn; legs and feet whitish-flesh.

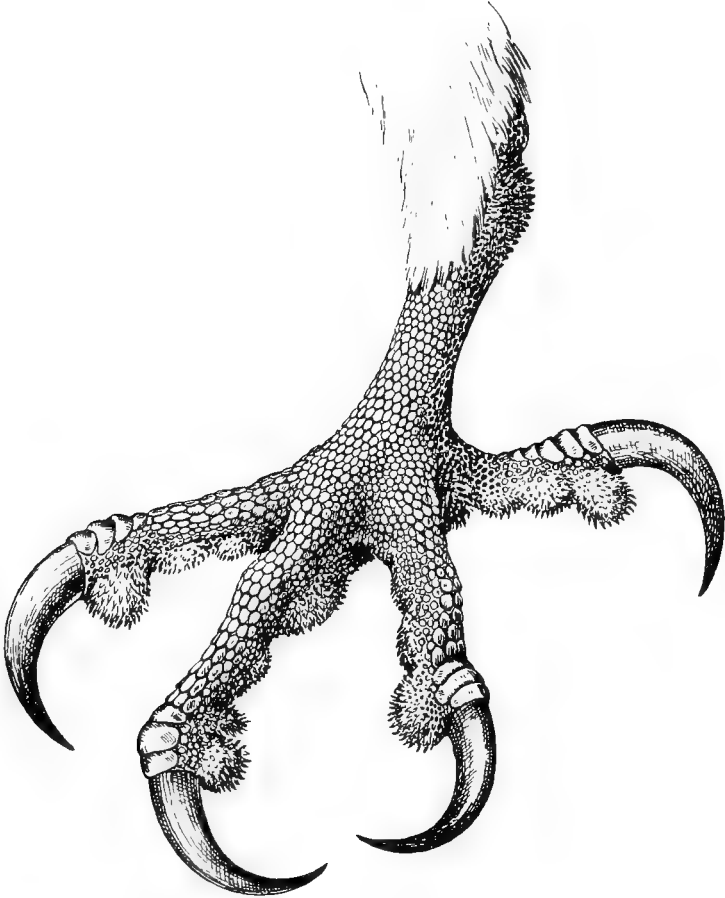


FIG. 87.—Foot of *Scotopelia peli*. $\times \frac{2}{3}$.

Length about 23; wing 18·4; tail 10·8; tarsus 2·9; culmen 2·3̄.

Distribution.—This Owl is found throughout the greater part of tropical Africa from Gambia in the west and the Tana river in the east, southwards to the Zambesi, where it was obtained many years

ago by the Livingstone expedition and more recently at Zumbo by Alexander.

South of the Zambesi it is very rare; there is a specimen obtained on the Umlass river near Durban by Gordge now in the Shelley collection; Mr. Quekett tells me he has heard of an example having been recently shot at Umzinto in the Alexandria district of Natal; finally Mr. Sydney Turner of Port St. John's in Pondoland shot a Pel's Fishing Owl on the St. John's river some years ago, thus bringing the species within the limits of the Colony.



FIG. 88.—*Scotopelia peli*. $\times \frac{2}{3}$

Habits.—The Fishing Owl is usually seen in pairs, each pair occupying a separate district, usually in the neighbourhood of a river; during the day they take refuge in the thick bush found along the banks, but at night they are flying about hunting for their prey, which consists of fishes and probably of small mammals as well. Waller states moreover that they capture and devour Guinea fowls while roosting. Their voice is a deep humming note repeated alternately by male and female and has a very weird sound in the still dark night.

Order V. ACCIPITRES.

Bill strong, upper mandible longer than the lower, culmen curved and ending in a hook; basal portion of the upper mandible covered by a soft membrane, the cere, in which are pierced the nostrils; the feet strong, always provided with a hallux and powerful claws. Female usually larger than the male; young hatched helpless and covered with down, usually remaining in the nest for some time.

Other characters are as follows: oil-gland present and tufted; a well-defined spinal feather-tract on the neck; two carotids; plantar tendons usually galline; ambiens muscle always present; palate usually desmognathous; primaries eleven, tail-feathers usually twelve sometimes fourteen.

This Order contains the diurnal birds of prey, which are now usually separated from the Owls. With regard to the further division of the Order, there can be no doubt that, apart from the Condors of the New World which do not here concern us, the Secretary bird and the Osprey form two very distinct groups, which by some authors have been considered as suborders; the Vultures on the other hand are certainly more closely allied to the typical Hawks. Perhaps however the most convenient way of dealing with the Order will be to recognise four families, which may be separated from one another by the following superficial characters.

- A. Legs very long, tarso-metatarsus about half the length of the wing *Serpentariidæ*, p. 402.
- B. Legs moderate, tarso-metatarsus never a quarter length of the wing.
 - a. Outer toe reversible, no after-shaft to the contour feathers *Pandionidæ*, p. 398.
 - b. Outer toe not reversible, after-shaft present.
 - a¹. Crown of the head naked or covered with down *Vulturidæ*, p. 382.
 - b¹. Crown of the head covered with feathers ... *Falconidæ*, p. 263.

Family I. FALCONIDÆ.

This family contains the great majority of the birds of prey, and the following are the principal characters distinguishing it. Skull generally with desmognathous palate and never with basipterygoid processes, deep plantar tendons galline (see fig. 2*b*, p. 2), *i.e.*, the

flexor longus hallucis supplies the hallux, sending a slip to the second toe ; as a rule the two tendons are connected by a vinculum ; oil gland tufted ; ambiens and femoro-caudal muscles present ; outer toe not reversible ; after-shafts present, head covered with feathers.

Authorities are in marked disagreement in regard to the division of this family into subfamilies ; I have, therefore, here not attempted to separate the genera into larger divisions.

Key of the Genera.

- Edge of the upper mandible with a distinct tooth behind the hook.
- a.* Head not crested, no long feathers on the flanks.
- a*¹. Nostrils rounded with a central bony tubercle.
- a*². Tarsus distinctly shorter than the middle toe and claw, inner and outer toes equal *Falco*, p. 266.
- b*². Tarsus equal to or longer than the middle toe and claw, outer toe longer than the inner *Tinnunculus*, p. 275.
- b*¹. Nostrils oval without bony tubercle ; tarsus $1\frac{1}{2}$ times length of the middle toe
- b.* Head crested ; flank feathers elongated covering the abdomen and thighs *Baza*, p. 286.
- B.* Edge of the upper mandible straight or slightly sinuated, not toothed.
- a.* Tibia and tarsus practically equal in length, the difference between them always less than the hind claw.
- a*¹. Lores and sides of the face bare ; tarsus covered with polygonal scales *Polyboroides*, p. 379.
- b*¹. Lores and sides of the face covered with feathers and bristles.
- a*². Nostrils circular with a central bony tubercle *Melierax*, p. 360.
- b*². Nostrils oval without bony tubercle.
- a*³. Tarsus with transverse shields in front and smaller polygonal ones behind..... *Circus*, p. 366.
- b*³. Tarsus with transverse shields in front and behind, with a few smaller polygonal ones at the sides.

- a*⁴. Middle toe elongated; without claw more than twice the length of the culmen without cere *Accipiter*, p. 347.
- b*⁴. Middle toe without claw equal to or less than twice the length of the culmen without cere ... *Astur*, p. 354.
- b*. Tibia much longer than the tarsus, always exceeding it by more than the length of the hind claw.
- a*¹. Lores clothed with bristles.
- a*². Tarsus feathered to the toes.
- a*³. Nostrils concealed by bristles; a tuft of bristles on the chin *Gypaëtus*, p. 320.
- b*³. Nostrils not so concealed, no bristles on the chin.
- a*⁴. An occipital crest of long feathers whose length exceeds the distance by which the wings fall short of the tail..... *Lophoaëtus*, p. 307.
- b*⁴. Crest if present small.
- a*⁵. Wings short and rounded, differences between the length of the primaries and secondaries hardly noticeable *Spizaëtus*, p. 303.
- b*⁵. Wings long and pointed, difference between the primaries and secondaries exceeding the length of the tarsus.
- a*⁶. Ridge of the culmen equal to the inner toes without claw *Eutolmaëtus*, p. 298.
- b*⁶. Ridge of the culmen longer than the inner toe without claw..... *Aquila*, p. 291.
- b*². Lower portion of the tarsus bare.
- a*³. Tarsus covered behind and in front by transverse scutes..... *Buteo*, p. 329.
- b*³. Tarsus never with transverse scutes behind.
- a*⁴. Nostrils rounded with central bony tubercle; tarsus with transverse scutes in front *Asterinula*, p. 327.
- b*⁴. Nostrils oblique ovals; tarsus covered with polygonal scales throughout *Circaëtus*, p. 322.
- c*⁴. Nostrils rounded; tarsus with transverse scales in front; tail forked *Milvus*, p. 335.

- d*⁴. Nostrils horizontal ovals, tarsus with small rounded or polygonal scales; tail only slightly forked or square *Elanus*, p. 339.
- e*⁴. Nostrils oblique slits, tarsus covered with small polygonal scales; bill very weak, compressed and keeled *Machærhamphus*, p. 344.
- b*¹. Lores and a space round the eye naked without bristles or feathers.
- a*². Tail moderate, about one-third the length of the wing.
- a*³. Bill compressed and slender and without festoon, tarsus covered with small hexagonal scales *Gypohierax*, p. 318.
- b*³. Bill stout, edge of the upper mandible distinctly festooned, tarsus with three or four transversely enlarged scutes *Haliaëtus*, p. 309.
- b*². Tail very short, about quarter length of wings; tarsus covered throughout with swollen and rounded scales ... *Helotarsus*, p. 314.
- c*¹. Lores covered with small scale-like feathers, no bristles *Fernis*, p. 345.

Genus I. **FALCO.***Type.***Falco**, *Linn. Syst. Nat.* i, p. 124 (1766) *F. peregrinus*.

Bill strong, sharply down-curved and hooked; edge of upper mandible with a well-marked tooth behind the hook and often a festoon as well; nostrils round, with central tubercle; wings long and pointed, reaching nearly to the tip of the tail, third primary usually the longest; difference between the primaries and secondaries more than half the length of the tail; tail slightly rounded; tarsus about as long as the middle toe without claw, upper third feathered in front, bare portion covered with hexagonal scales which are rather larger in front; toes all very long, the outer one longer than the inner; claws much curved and sharp.

This genus, containing the true Falcons, is cosmopolitani, being found throughout the world except in the Pacific Islands. Some twelve species have been noticed in Africa, five of which reach our limits.

Key of the Species.

- A. Larger wing over 11·0.
 a. Head like the back, blue or dark brown *F. minor*, p. 268.
 b. Head and nape rufous, contrasting with the
 blue or brown back..... *F. biarmicus*, p. 269.

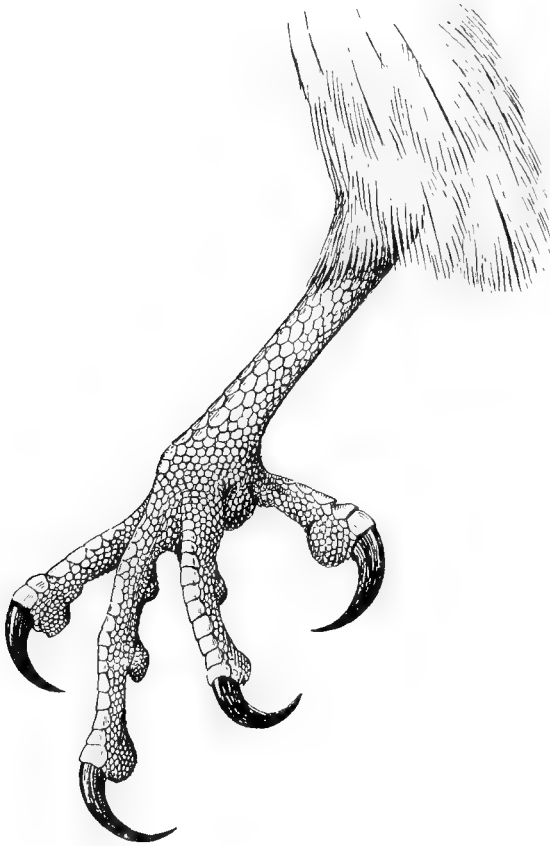


FIG. 89.—Left foot of *Falco biarmicus*. $\times \frac{9}{15}$

- B. Smaller, wing under 11·0.
 a. Thighs orange-rufous.
 a'. Under parts whitish with broad brown
 streaks *F. subbuteo*, ad. p. 272.

- b¹. Underparts orange-rufous like the thighs,
with narrow brown streaks *F. cuvieri*, *ad.* p. 273.
- b. Thighs whitish, streaked with brown.
- a¹. Ear coverts black *F. subbuteo*, *juv.* p. 272.
- b¹. Ear coverts tawny, narrowly streaked
with black..... *F. cuvieri*, *juv.* p. 273.
- c. Thighs transversely banded with black and
white like the abdomen *F. ruficollis*, p. 274.

503. **Falco minor.** *South African Peregrine.*

Falco peregrinoides (*nec Temm.*) *Smith*, *S. A. Quart. Journ.* i, p. 235 (1830).

Falco minor, *Bp. Rev. Mag. Zool.* 1850, p. 484; *Gurney, Ibis*, 1861, p. 181 [Natal]; *Layard, B. S. Afr.* p. 19 (1867); *id. Ibis*, 1869, p. 362 [Berg river]; *Gurney in Andersson's B. Damaraland*, p. 12 (1872); *Sharpe, Cat. B. M.* i, p. 383, pl. xii (1874); *Sharpe, cd. Layard's B. S. Afr.* p. 57 (1875); *Holub & Pelzeln, Orn. Süd-Afr.* p. 28 (1882); *Gurney Ibis*, 1882, pp. 306, 313; *Shelley, B. Afr.* i, p. 145 (1896); *Woodward Bros. Natal B.* p. 151 (1899); *Reichenow, Vög. Afr.* i, p. 622 (1901).

Falco peregrinus, var. *capensis*, *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 48 (1858).

Description. *Adult male.*—General colour above, slaty-blue, darkest, almost black, on the nape and shoulders; most of the feathers of the back and wing-coverts marked with darker transverse bars; quills dark slate, regularly spotted with very pale fawn; tail like the back with narrow white tips and a subterminal almost black band and traces of others; a black moustache patch below the eye between which and the crown is a patch of white, lower surface white tinged with pale fawn, the chest with a few narrow darker fawn shaft stripes, the lower breast and abdomen with narrow spots of blackish forming regular narrow transverse bars on the flanks and thighs, lower surface of tail and wings pale ashy.

Iris brown; bill black; cere and base of both mandibles yellow; legs bright yellow; claws almost black.

Length 17.25; wing 12.25; tail 5.80; culmen 1.15; tarsus 1.90.

The female is larger; wing 12.27. A young bird is brown above, the nape somewhat mottled with yellow and most of the feathers edged and tipped with pale tawny; the primaries are spotted on the inner webs and the tail on both webs with pale tawny; below, pale yellowish-buff, streaked with broad splashes of brown. Iris dark brown.

Distribution.—The South African Peregrine differs from the European bird in its slightly smaller size; also it does not seem to possess at any stage the rufous patch on the nape found in the more northern bird.

It is by no means common in South Africa though widely distributed. Beyond our limits it is found in Madagascar, Nyasaland, Angola, and Abyssinia, though there seems to be some little doubt as to whether the bird from north-east Africa should not be identified with the true Peregrine of Europe.

The following are South African localities where this bird appears to be found chiefly if not exclusively in the summer months. Cape Colony—Cape div. January (Victorin, Smith, and Layard), Stellenbosch, January, and Malmesbury, March (S. A. Mus.), Swellendam (Atmore), Knysna, April (Victorin), Albany (Atherstone and Grahamstown Museum), Uitenhage (Smith), East London in summer (Wood), Port St. John's, Oct. (Shortridge); Natal—Near Durban (Durban Mus.); Rhodesia—Pandamatenka (Holub); German south-west Africa—near Otjimbingue and Ondonga, January (Andersson).

Habits.—But little has been written about the habits of this Falcon, probably in this respect it does not differ from the more familiar Peregrine of Europe.

In regard to the breeding habits, however, it diverges, as it is stated by Mr. Kotze of Berg river to build in trees instead of laying its eggs on a ledge of a cliff or in an old crows' nest. The eggs as described by Layard are three in number, usually more or less spotted and stained with dry blood-colour on a dirty cream-coloured ground and varying very much in markings; they measure 1.75×1.3 .

504. *Falco biarmicus*. *South African Lanner*.

Falco biarmicus, *Temm. Pl. Col. i*, pl. 324 (1825); *Gurney, Ibis*, 1860, p. 207, 1862, p. 154 [Natal]; *Layard, B. S. Afr.* p. 20 (1867); *Sharpe, Cat. B. M. i*, p. 391 (1874); *id. ed. Layard's B. S. Afr.* pp. 58, 800, pl. ii (1875-84); *Buckley, Ibis*, 1874, p. 360; *Ayres, Ibis*, 1877, p. 341 [Lydenburg]; *Oates, Matabeleland*, p. 299 (1881) [Newcastle]; *Holub & Pélzeln, Orn. Süd-Afr.* p. 28 (1882); *Butler, Feilden, and Reid, Zool.* 1882, p. 170 [Newcastle]; *Shelley, Ibis*, 1882, p. 239 [Mashonaland]; *Gurney, Ibis*, 1882, p. 442; *Shelley, B. Afr. i*, p. 145 (1896); *Sowerby, Ibis*, 1898, p. 574 [Chiquaqua]; *Woodward Bros. Natal Birds*, p. 151 (1899); *Marshall, Ibis*, 1900, p. 270 [Mashonaland]; *Reichenow, Vög. Afr. i*, p. 624 (1901).

Falco chiqueroides, *Smith, S. A. Quart. Journ.* i, p. 233 (1830).

Falco cervicalis, *Gurney in Andersson's B. Damaraland*, p. 13 (1872).

Falco tanypterus (*nec Schleg.*) *Fleck, Journ. Ornith.* 1894, p. 393.

Description. *Adult female.*—Crown of the head brick-red with black shafts becoming whitish on the fore-part of the forehead; a stripe across the forehead above the eye and ear-coverts to the sides of the neck, a patch below the eye and a nape spot black; cheeks and ear-coverts pale rufous; general colour of the back dark slate, all the feathers except the wing-primaries barred and tipped bluish-grey; primaries slaty-black, barred on the inner webs with white; tail with about ten light and ten dark narrow bands tipped with



FIG. 90.—*Falco biarmicus*. $\times \frac{9}{10}$.

white; below, very pale fawn colour, in quite adult birds unspotted throughout, but in younger individuals with a few spots of dark brown especially on the flanks; axillaries and under wing-coverts also pale fawn spotted with dark brown.

Iris brown; bill horn-coloured at base, blue at tip; cere and skin round the eye pale yellow; legs yellow.

Length 17·0; wing 13·0 to 13·75; tail 6·80; culmen 1·10; tarsus 2·10.

A male is smaller; length 16·0; wing 11·50 to 12·0.

The young bird has the black on the head rather more extended; the upper surface is dark brown with pale rufous edgings to the feathers, the tail is dark brown barred and tipped with pale rufous, under surface pale fawn thickly spotted on the breast and upper

abdomen with elongate brown spots, throat and under tail-coverts unspotted, thighs with brown shaft streaks.

Distribution.—The South African Lanner is fairly common in suitable localities throughout South Africa and extends northwards to Angola, Nyasaland and Central Africa as far as Victoria Nyanza at any rate, perhaps to Abyssinia; here, however, it meets the very closely-allied *F. tanypterus* which is spotted below to a certain extent even in old birds and the exact boundary of the ranges of the two species is not yet accurately demarcated.

The following are some of the principal South African localities: Cape Colony—Worcester, Caledon, Beaufort West, Peddie, and Orange river near Upington (S. Afr. Mus.), Albany div. (Grahamstown Mus.), Eland's Post in Stockenström (Atmore), Colesberg (Ortlepp), Little Namaqualand (Andersson), Latakoo near Kuruman (Brit. Mus.); Natal—Rare in coast country (Ayres), common in the midlands and highlands (Woodward), Newcastle (Oates and Feilden); Transvaal—Lydenburg and Potchefstroom (Ayres and S. A. Mus.); Rhodesia—Tati river (Holub), Mashonaland (Ayres and Marshall); German south-west Africa—Throughout (Andersson), Omaruru (Eriksson in S. A. Mus.).

Habits.—The South African Lanner is usually found in mountainous districts, where it has its eyrie on some inaccessible cliff and whence it sets forth daily after its prey. It is extraordinarily rapid on the wing and will often follow a party out partridge-shooting, dashing down on wounded birds and carrying them off if possible; it is also a scourge to the poultry yard and dove-cot. Small mammals, reptiles, and even grasshoppers are also eaten.

Mr. Ayres found the Lanner breeding in the Lydenburg district of the Transvaal in June and July, but gives no details.

Butler found a nest containing young birds in down in a kloof in the Drakensberg near Newcastle on August 18. The nest was a good sized stick-structure and built in a small green bush on the side of a precipitous cliff within six feet of the summit, but in an inaccessible situation, on account of an overhanging ledge of rock which completely covered it from above. The chicks were but a few days old and were covered with white down. The nest looked as if it was an eyrie of long standing and had probably been used by the same pair of birds for several years.

Ayres kept for some time a pair of young birds, which he found became very tame and docile.

505. *Falco subbuteo*. *Hobby*.

Falco subbuteo, *Linn. Syst. Nat.* i, p. 127 (1766); *Dresser, B. Eur.* v., p. 69, pl. 379 (1871); *Sharpe, Cat. B. M.* i, p. 395 (1874); *id. ed. Layard's B. S. Afr.* p. 59 (1875); *Gurney, Ibis*, 1882, p. 152; *Shelley, B. Afr.* i, p. 145 (1896); *Marshall, Ibis*, 1900, p. 259 [near Salisbury]; *Alexander, Ibis*, 1900, p. 434 [Zambesi]; *Reichenow, Vög. Afr.* i, p. 628 (1901).

Hypotriorchis subbuteo, *Layard, B. S. Afr.* p. 21 (1867) [in part]; *Gurney in Andersson's B. Damaraland*, p. 14 (1872).

Description. Adult male.—(Ovampoland)—General colour above, dark slaty-grey, darkest on the head, lighter on the rump, most of the feathers with dark shaft streaks; forehead and eyebrow whitish, nape tinged with rufous; primaries darker than the back, both they and the tail-feathers barred with rufous on the inner webs; moustache-streak and patch round the eye black; chin, throat, and breast very pale rufous, the latter with conspicuous brown longitudinal streaks; abdomen, flanks, thighs, and under tail-coverts rich rufous; under wing-coverts pale rufous mottled with black.

Iris dark-brown; bill bluish-black, yellowish at the base; cere, orbits, and feet yellow.

Length 12·0; wing 9·60; tail 5·25; culmen 0·75; tarsus 1·35.

The female is larger, length 13·5; wing 10·6.

A young bird is greyish-black above, with fulvous edging and tips to the feathers; the forehead is white, the nape spot is more conspicuous, almost forming a collar, and is nearly white; ear-coverts black; below, the ground colour is white to pale rufous throughout, and the spots are continued on to the thighs and flanks; the rufous bars on the tail are also more conspicuous.

Distribution.—The European Hobby breeds throughout Europe and the greater part of Asia, from Spain and England eastwards to Kamtschatka and Japan; during the northern winter months it migrates southwards to India and the eastern half of Africa, extending its wanderings as far south as the neighbourhood of Cape Town.

Within our limits it is not very common. It does not appear to have been noticed in the Transvaal nor can it be abundant in Natal, as the only occurrence there recorded, so far as I am aware, is based on a single example in the British Museum. Most of the birds met with in South Africa appear to be young of the year.

The following are localities: Cape Colony—Cape division, March (S. A. Mus.) Beaufort West, George and Swellendam

(Layard), Knysna (Marais); Natal (Bt. Mus.); Rhodesia—Common near Salisbury (Marshall); German south-west Africa—Damara-land during the rainy season (Andersson), Ovaquenyama, February, and Ochimbora, November (Eriksson in S. A. Mus.).

Habits.—Marshall states as follows:—"Though I have observed but few myself, the Hobby would appear to be fairly common round Salisbury, for Mr. Swynnerton has recently shot five specimens, nearly all of which were obtained while they were hawking for crepuscular insects when it was almost dark. The stomachs contained beetles, locusts, and a butterfly." Andersson also states that the Hobby feeds principally on locusts and white ants.

As the Hobby is a migrant from the European winter it is not likely to be found breeding in South Africa, but in Europe it usually adapts for itself the nest of some other bird such as a Crow or Magpie. The eggs, three in number, are, as a rule, yellowish-white closely freckled with rufous, sometimes suffused with reddish-brown.

506. *Falco cuvieri.* *African Hobby.*

Falco cuvieri, *Smith, S. Afr. Quart. Journ.* i, p. 392 (1830); *Sharpe, Cat. B. M.* i, p. 400 (1874); *id. ed. Layard's B. S. Afr.* p. 59 (1875); *Gurney, Ibis*, 1882, p. 152; *Shelley, B. Afr.* i, p. 145 (1896); *Reichenow, Vög. Afr.* i, p. 630 (1901).

Falco bosschii, *Schleg, Nederl. Tijdschr.* i, p. 123, pl. 5 (1863).

Description. Adult.—Above, very dark slate, darkest on the head; a distinct rufous collar on the nape; primary quills barred with rufous on the inner web; two centre feathers of the tail unbarred, others barred on both webs with rich rufous; a stripe below the eye and malar stripe black; under surface, including the cheeks and sides of the neck, rufous, very pale on the throat, darker on the flanks and under tail-coverts; the breast-feathers all marked with narrow dark brown shaft stripes.

Iris brown; bill dark horny-blue, yellowish at the base of the lower mandible; cere, orbits and feet orange.

Length 13; wing 9; tail 5.25; culmen 0.75; tarsus 1.25.

A young bird in the South African Museum is brown above, with rufous edgings and tips to most of the feathers, the crown is streaked with black, the ear-coverts tawny streaked with black; the tail-feathers are all conspicuously barred with pale fulvous on both webs; the under-surface is white with conspicuous brown streaks on the breast and flanks.

Distribution.—Africa, south of the Sahara from the Gambia river on the west and Shoa on the east southwards. In South Africa it appears to be an exceedingly rare bird. The type was obtained by Sir Andrew Smith on the banks of the Kei river in the eastern half of the Colony. There is a young specimen from the neighbourhood of Durban, obtained in February, preserved in the South African Museum, but beyond these two I know of no other recorded localities in South Africa.

507. **Falco ruficollis.** *Red-necked Falcon.*

Falco ruficollis, *Swains. B. W. Afr.* i, p. 107, pl. 2 (1837); *Sharpe, Cat. B. M.* i, p. 404 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 60, 800 (1875-84); *Gurney, Ibis*, 1882, p. 161; *Butler, Feilden, and Reid, Zool.* 1882, p. 170 [Rorke's Drift]; *Shelley, B. Afr.* i, p. 145 (1896); *Alexander, Ibis*, 1900, p. 434 [Zambesi]; *Reichenow, Vög. Afr.* i, p. 631 (1901).

Chicquera ruficollis, *Gurney, Ibis*, 1868, p. 141; *Ayres, Ibis*, 1869, p. 288, 1878, p. 282 [Potchefstroom]; *Gurney in Andersson's B. Damaraland*, p. 14 (1872).

Hypotriorchis ruficollis, *Layard, B. S. Afr.* p. 21 (1867).

Description. Adult male.—Crown and hind neck rich chestnut, forehead whitish; small eyebrow and a patch below the eye black, rest of the upper surface cobalt-blue narrowly barred with black throughout; quills black barred with bluish on the inner webs; proximal two-thirds of the tail like the back, distal third black with white tip; below, chin and throat white, cheeks and breast very pale chestnut, rest of the lower surface including the under wing-coverts silvery-blue transversely barred with black like the back.

Iris brown; bill horny-black, yellow at the base; cere and orbits bright yellow; legs dark yellow; claws black.

Length 12.25; wing 8.30; tail 5.35; culmen 0.75; tarsus 1.70.

The female is larger, length 14.0; wing 9.51; tarsus 1.90.

In the young bird, according to Alexander, the crown and nuchal patch are blackish, the feathers edged with chestnut, the forehead, neck, and throat creamy-white, the feathers of the interscapular region greyish-black, edged with rufous, as are those of the wing-coverts, mantle, and rump; feathers of the chest with dark rufous shafts.

Distribution.—The Red-necked Falcon is found over the greater part of Africa from Senegambia and Abyssinia southwards. In South Africa it is by no means common, and has only been twice recorded

from the Colony and once from Natal. It appears to become more abundant towards the tropics, especially along the banks of rivers.

The following are the recorded localities: Cape Colony—Nelspoort in Beaufort West (Layard), Orange river near Upington in May (Bradshaw in S. A. Mus.); Natal—Rorke's drift on the Buffalo, October (Reid); Transvaal—Potchefstroom, May and July (Ayres in S. A. Mus.); Portuguese east Africa—Chicowa on the Zambesi, January and September (Alexander), Urema river near Beira, October (S. A. Mus.); rare in German south-west Africa (Andersson).

Habits.—This Falcon is nearly always found in pairs and frequents the tops of trees generally along river-banks, whence it keeps a good look out for its prey, which usually consists of small birds. It is also exceedingly fond of locusts and white ants, when these are abundant. In tropical Africa it is always to be found along the rivers, where there are *Borassus* palms, among the thick leaves of which it roosts, often in company with the Guinea Pigeon, with which it lives in apparent amity.

It has not hitherto been found breeding in South Africa, but Reichenow describes the egg as somewhat rounded in shape, with a yellowish ground colour spotted and blotched with rufous-brown and measuring 1.6 × 1.3.

Genus II. **TINNUNCULUS.**

Type.

Tinnunculus, *Vieill. Ois. Amér. Sept.* i, p. 39 (1807)...*T. sparverius*.

Bill weaker than in *Falco*, hooked, with a single tooth and a slight festoon; nostrils circular with a central bony tubercle sometimes slightly overhung but never concealed by bristles; wings long and pointed, the difference between the primaries and secondaries always more than half the length of the tarsus; tail long and slightly rounded; tarsus always longer than the middle toe, feathered in front for about its upper third, the bare portion covered with hexagonal scales which are larger in front; outer and inner toes about equal.

This genus contains the Kestrels and their allies, and in this work includes the birds separated by some authors under the generic titles of *Erythropus* and *Dissodectes*. Under these circumstances the genus contains some thirty-three species spread all over

the world except in the Pacific Isles. Of these fifteen occur in Africa, and six here described from South Africa.

The European Kestrel (*T. alaudarius*) has sometimes been included among South African birds, notably by Sharpe in his edition of Layard's work. The only recorded instance however of its occurrence has been shown by Gurney to be due to a mistake in identification.

Key of the Species.

- | | | |
|------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------|
| A. | Head blue or bluish, contrasting with the rufous back. | |
| a. | Back spotted with black; claws black | <i>T. rupicolus</i> , ad. p. 276. |
| b. | Back without spots, claws pale horn | <i>T. naumanni</i> , ♂, p. 280. |
| B. | Head tawny-rufous like the back. | |
| a. | Claws black, tail blue. | |
| a ¹ . | Larger wing about 11·0; back and thighs transversely barred with black | <i>T. rupicoloides</i> , p. 279. |
| b ¹ . | Smaller wing less than 10·0; back and thighs spotted with black... | <i>T. rupicolus</i> , juv. p. 276. |
| b. | Claws pale horny; tail rufous like back..... | <i>T. naumanni</i> , juv. p. 280. |
| C. | Head, like the back, dark slate; back unstreaked. | |
| a. | Under wing-coverts slate, like the back | <i>T. vespertinus</i> , ♂, p. 282. |
| b. | Under wing-coverts white, contrasting with the back..... | <i>T. amurensis</i> , ♂, p. 284. |
| D. | Head rufous, contrasting with the back, which is silvery-grey transversely banded with black | <i>T. vespertinus</i> , ♀, p. 282. |
| E. | Head and back dark brown, forehead and nape white | <i>T. vespertinus</i> , juv. p. 282. |
| F. | Head and back bluish-slate, the latter transversely banded with black..... | <i>T. amurensis</i> , ♀ et juv. p. 284. |
| G. | Head and rump grey, contrasting with the black back | <i>T. dickinsoni</i> , p. 285. |

508. **Tinnunculus rupicolus.** *South African Kestrel.*

Le Montagnard, *Levaill. Ois. d'Afr.* i, p. 144, pl. 35 (1799).

Falco rupicolus, *Daud. Traité*, ii, p. 135 (1800); *Smith, S. Afr. Quart. Journ.* i, p. 237 (1830); *Grill, K. Vet. Akad. Handl.* ii, no. 10 p. 47 (1858) [Knysna].

Tinnunculus rupicolus, Gurney, *Ibis*, 1859, p. 240 [Natal]; *P. L. Slater*, *Proc. Zool. Soc.* 1866, p. 22 [Windvogelberg]; *Layard*, *B. S. Afr.* p. 22 (1867); *Gurney in Andersson's B. Damaraland*, p. 18 (1872); *Buckley, Ibis*, 1874, p. 360 [Tugela river]; *Shelley, Ibis*, 1875, p. 66 [Pinetown]; *Ayres, Ibis*, 1877, p. 341 [Potchefstroom]; *Gurney, Ibis*, 1881, p. 465; *Holub and Pelzeln, Orn. Süd-Afr.* p. 29 (1882); *Shelley, Ibis*, 1882, p. 239 [Spaldings]; *Symonds, Ibis*, 1887, p. 326 [Kroonstad]; *Shelley, B. Afr.* i, p. 146 (1896); *Woodward Bros. Ibis*, 1898, p. 220 [Zululand]; *Haagner, Ibis*, 1901, p. 193 [near Johannesburg].

Cerchneis rupicola, *Sharpe, Cat. B. M.* i, p. 429 (1874); *id. P. Z. S.* 1874, p. 580, pl. 68; *id. ed. Layard's B. S. Afr.* pp. 62, 800 (1875-84); *Oates, Matabeleland*, p. 299 (1881) [Newcastle, Natal]; *Fleck, Journ. Ornith.* 1894, p. 394; *Sowerby, Ibis*, 1898, p. 575 [near Salisbury]; *Woodward Bros. Natal B.* p. 152 (1899); *Reichenow, Vög. Afr.* i, p. 640 (1901).

“Roodevalk,” “Rooivalk,” or “Steenvalk” of Dutch.



FIG. 91.—*Tinnunculus rupicolus*. $\times \frac{1}{2}$.

Description.—Crown, nape, and sides of the head dull slate narrowly streaked with black; back, scapulars and wing-coverts chestnut with a few diamond-shaped spots of dark brown; wing-quills and greater coverts dark brown, the former barred on their inner webs with white; upper tail-coverts and tail-feathers slaty-grey, the latter with a broad subterminal band of black and white tips, all except the two centre feathers narrowly barred with black on the inner web only; below, chestnut becoming much paler on the throat and under tail-coverts, the upper breast with longitudinal, the lower with diamond-shaped black spots, thighs and under tail-coverts unspotted; under wing-coverts white with a few black spots.

Iris dark brown; bill bluish-black, darkest at the tip; cere and orbits yellow; legs ochre-yellow; claws black.

Length (in flesh) 12·5; wing 9·3; tail 6·0; culmen 0·75; tarsus 1·75.

Most of the female birds have all the tail-feathers barred with black on both webs, though apparently very old birds have the tail as in the male; size much as in the male, perhaps slightly larger, average length of wing of three males 9·3, of six females 9·4.

A young bird has the head rufous thickly streaked with black, the back is more profusely spotted with black and the primaries and tail-feathers tipped with pale rufous; the tail is strongly barred on both webs with black; below, the streak-like spots extend onto the abdomen and thighs.

Distribution.—This appears to be almost everywhere the commonest hawk in South Africa, and to be a resident throughout the year from Cape Town to the Cunene and from Durban to the Zambesi. Beyond our limits it has only been noticed in Nyasaland and Angola, and it probably does not extend to the north of the 10° of south latitude.

The following are a few of the more important localities recorded: Cape Colony—Cape div. January and June, Worcester, May (S. A. Mus.), Port Elizabeth and East London (Rickards), Middelburg and Orange river (S. A. Mus.); Natal—Common throughout from Durban (S. A. Mus.) to Newcastle (Oates); Orange River Colony—Kroonstad (Symonds); Transvaal—Potchefstroom (Ayres) and near Johannesburg (Haagner); Rhodesia—Salisbury dist. (Sowerby); German south-west Africa—throughout (Andersson).

Habits.—The South African Kestrel closely resembles its English ally in habits and markings, the most noticeable difference being that the blue of the crown of the head extends over the ear-coverts and cheeks in the South African bird. It is generally found in pairs, and spends the day watching from a fixed post or hovering in the air on the look-out for mice, small birds, and grasshoppers, which form the chief portion of its diet, and on which it swoops down with great speed and dexterity. It is by no means a shy bird, and it has a somewhat shrill musical whistle which it practises early and late.

It nests in clefts in the sides of precipices and occasionally in mimosa trees, while Symonds noticed a pair which built for four or five years in succession in an inaccessible situation on the Dutch Church at Kroonstad. Haagner found a nest on October 7 at Modderfontein near Johannesburg, in a mimosa. It was constructed of twigs lined with hair, wool, and feathers, and contained three eggs.

These were cream coloured, thickly spotted and blotched with various shades of brown, and measured about 1·7 × 1·3. The eggs, however, vary considerably in size and markings, some being of a pure cream colour almost without spots.

509. *Tinnunculus rupicoloides*. *Larger Kestrel*.

Falco rupicoloides, *Smith, S. Afr. Quart. Journ.* i, p. 238 (1830); *id.*, *Ill. Zool. S. Afr. Aves*, pl. 92 (1844).

Tinnunculus rupicoloides, *Layard, B. S. Afr.* p. 23 (1867); *Gurney, Ibis*, 1868, p. 142; *Ayres, Ibis*, 1869, p. 288 [Potchefstroom]; *Gurney in Andersson's B. Damaraland*, p. 19 (1872); *id. Ibis*, 1881, p. 465; *Holub & Pelzeln, Orn. Süd-Afr.* p. 30 (1882); *Ayres, Ibis*, 1885, p. 342 [Potchefstroom]; *Symonds, Ibis*, 1887, p. 326 [Kroonstad]; *Shelley, B. Afr.* i, p. 146 (1896); *Marshall, Ibis*, 1900, p. 259 [Salisbury]; *Haagner, Ibis*, 1901, pp. 16, 193 [Modderfontein].

Cerchneis rupicoloides, *Sharpe, Cat. B. M.* i, p. 432 (1874); *id. ed. Layard's B. S. Afr.* pp. 63, 800 (1875-84); *Barratt, Ibis*, 1876, p. 196 [Rustenburg]; *Oates, Matabeleland*, p. 299 (1881); *Builer, Feilden, and Reid, Zool.* 1882, p. 171 [Rorke's Drift]; *Fleck, Journ. Orn.* 1894, pp. 370, 394 [Kalahari]; *Reichenow, Vög. Afr.* i, p. 639 (1901).

Description. Adult male.—General colour above, pale rufous; the head and nape with narrow streaks of black, the back and wings with broad bars of the same colour; rump and upper tail-coverts pale slaty-blue, subterminally barred with black; quills very dark brown, white on the basal half of the inner web and notched with rufous, on the inner feathers a row of rufous spots on the outer web as well; tail banded slaty-blue and black; the subterminal black band about twice as broad as the others, the tip white; below pale rufous, narrowly streaked on the breast, barred on the flanks with very dark brown, under wing- and tail-coverts white.

Iris pale yellow to white, eyelids yellow; bill bluish-ash, yellowish at the base; cere yellow; tarsi and feet yellow.

Length 14·5; wing 11; tail 6·25; culmen 0·80; tarsus 2·20.

The female is a little larger, length 15·5; wing 11·5.

Distribution.—The Larger Kestrel is, so far as we know, confined to South Africa and has not yet been found north of the Zambesi, though a closely-allied species (*C. fieldi*) has recently been described from Somaliland.

Our present species was first discovered by Sir A. Smith, whose example was shot on the banks of the Groene river in Little

Namaqualand, and it appears to be chiefly found on the drier and higher portions of the South African plateau. The following are recorded localities: Cape Colony—Beaufort West (Jackson), Albany div. rare (Grahamstown Mus.), Orange River, near Aliwal North (Whitehead), near Port Nolloth in Namaqualand (Stark); Natal—Rorke's Drift and Ladysmith (Butler, Feilden, and Reid); Orange river Colony—Kroonstad rare (Symonds), Vredefort Road Station (B. Hamilton); Transvaal—Potchefstroom (Ayres), Rustenburg, Pretoria, and Lydenburg districts (Barratt and Oates), Modderfontein near Johannesburg (Haagner); Bechuanaland—Lake Ngami (Andersson), Linokana (Holub); Rhodesia—Salisbury, common (Marshall); German south-west Africa—Rare in Damaraland, common towards the Orange river (Andersson).

Habits.—This Kestrel closely resembles the previous species in its habits; it is not a timid bird and is often to be seen perched on telegraph wires whence it can keep a good look out for its prey. Shrews, mice, lizards, and insects of various kinds, specially scorpions and locusts, form its usual food.

This bird is no doubt a permanent resident in South Africa. It has been noticed nesting by several observers. Haagner found a clutch of five eggs on the 15th October in the deserted nest of a Secretary Bird which had been tenanted three years previously.

Marshall observed in 1897 a pair which nested on a ledge of the Cecil Hotel in Salisbury, but they failed to bring off their young as they were tormented by the crows. Mr. Jackson sent Mr. Layard a very large number of the eggs of this bird; these are of a dirty-white ground colour mottled and blotched with darker, but varying a great deal both in markings, shape, dimensions, averaging about 1.65×1.35 .

510. *Tinnunculus naumanni*. Lesser Kestrel.

Falco naumanni, *Fleisch, Sylvan.* p. 173 (1818).

Falco tinnunculoides, *Temm. Man. Ornith.* i, p. 30 (1820).

Falco cenchrus, *Cuv. Règne Anim.* i, p. 322 (1829); *Sharpe and Dresser, B. Europe* vi, p. 125, pl. 385 (1871).

Tinnunculus cenchrus, *Layard, B. S. Afr.* p. 22 (1867); *id. Ibis*, 1869, p. 362; *Gurney in Andersson's B. Damaraland*, p. 17 (1872); *Ayres, Ibis*, 1878, p. 282, 1879, p. 287, 1885, p. 342 [Potchefstroom]; *Gurney, Ibis*, 1881, p. 470; *id. List D. Bds. Prey*, p. 159 (1884); *Shelley, B. Afr.* i, p. 146 (1896).

Cenchrus naumanni, *Sharpe, Cat. B. M.* i, p. 435 (1874); *id. ed. Layard's B. S. Afr.* pp. 64, 800 (1875); *Woodward Bros. Natal B.* p. 153 (1899); *Reichenow, Vög. Afr.* i, p. 644 (1901).

Tinnunculus tinnunculoides, *Buckley, Ibis*, 1874, p. 361 [Limpopo];
Shelley, Ibis, 1882, p. 239 [Inshlangeen R.].

Cenchrus tinnunculoides, *Barratt, Ibis*, 1876, p. 196; *Oates, Matabeleland*, p. 299 (1881).

Tinnunculus naumanni, *Marshall, Ibis*, 1900, p. 260 (Salisbury).

Description. Adult male.—Head and neck, rump and upper tail-coverts, tail-feathers, and most of the wing-feathers bluish-grey; most of the outer wing-coverts slightly edged with cinnamon; centre of the back, scapulars and some of the inner, median, and lesser coverts rich cinnamon without spots; primaries black, white on the basal half of the inner web; tail with a broad subterminal band of black and a terminal tip of white; below, a paler cinnamon colour than the back, with a few spots of brown on the lower breast and flanks; thighs pale tawny, under tail-coverts yellowish-white; under wing-coverts white.

Iris dark brown; bill light blue, yellowish at base, darker at tip; cere, orbits and feet yellow; claws generally white.

Length 13·0; wing 9·0; tail 5·25; culmen 0·75; tarsus 1·25.

The female is very different from the male; above rufous; the crown and nape streaked, the back and wings barred with black; primaries black notched with pale rufous on the inner web; tail rufous barred with black, the subterminal band much broader and the tip white; cheeks and ear-coverts silvery-white with a few shaft lines of black; below, fulvous-white throughout; the breast streaked, the flanks spotted with black.

Length 12·5; wing 9·30.

The young male is like the adult female but somewhat paler rufous, the blue tail is gained by a moult but the blue head by a change of feathers.

Distribution.—The Lesser Kestrel breeds throughout southern Europe, north Africa, and western and central Asia, extending as far as China. In the northern winter it migrates southwards to India, and east and south Africa.

Within our limits, where it is only found during the southern summer, it is most abundant in Rhodesia and the Transvaal, and occurs but seldom in Cape Colony and Natal.

The following are localities: Cape Colony—Swellendam, January (Layard), King Williams Town (Trevelyan); Natal—Upper parts (Woodward); Transvaal—Potchefstroom, October, December, February and May (Ayres), Rustenburg district, November (Oates); Bechuanaland—Boatlanama (Exton in S. A. Mus.); Rhodesia—

Inshlangeen (*i.e.*, Shangani river) November (Ayres); German south-west Africa—Otjimbingue, February, scarce in Damaraland (Andersson).

Habits.—The Lesser Kestrel only visits this country to escape the winter of the northern hemisphere. It is almost invariably found in flocks often numbering many hundreds. These wander about the country in an irregular manner pursuing the flights of locusts on which they chiefly subsist. They catch the locusts on the wing, striking at them with their feet and conveying them to their mouth with their claws. They are tame birds, and after feeding and gorging themselves a number of them may often be seen perched on high trees. Mr. Marshall gives the following account. "This little Kestrel is fairly common during the rainy season, usually occurring in flocks which sometimes attain considerable proportions. When they hover they flutter their wings a good deal more than does *T. rupicoloides*, and it is a pretty sight to see twenty or thirty of them working systematically over an open piece of ground. Stomachs contained grasshoppers, centipedes, and beetles, and one bird was crammed with hunting spiders."

511. **Tinnunculus vespertinus.** *Western Red-legged Kestrel.*

Falco vespertinus, *Linn. Syst. Nat.* i, p. 129 (1766); *Sharpe and Dresser, B. Eur.* vi, p. 93, pl. 382 (1871).

Erythropus vespertinus, *Gurney, Proc. Zool. Soc.* 1864, p. 2; *id. in Andersson's B. Damaraland*, p. 15 (1872); *id. Ibis*, 1882, p. 146; *Shelley, B. Afr.* i, p. 145 (1896).

Cerchneis vespertina, *Sharpe, Cat. B. M.* i, p. 443 (1874); *id. ed. Layard's B. S. Afr.* p. 65 (1875).

Description. *Adult male.*—General colour above, dark, becoming almost black on the head and tail, and lighter and more silvery on the wings; below, silvery-slate throughout, except the thighs, abdomen and under tail-coverts, which are cinnamon-rufous; under wing-coverts slaty-black.

Iris light brown; bill yellowish-horn, blackish at the tip; cere, orbits, and feet bright brownish-red, claws yellowish-white, horn coloured at tips.

Length 12·5; wing 9·25; tail 5·0; culmen 0·70; tarsus 1·20.

The female differs from the male; crown rufous; the rest of the upper surface a silvery-grey everywhere barred with black; tail

tipped with white and with the subterminal bar of black about twice as broad as the others; feathers round the eye black; throat and cheeks white tinged with fulvous; rest of the underparts rufous becoming paler on the under tail-coverts; soft parts as in the male but less bright.

Length 11·0; wing 9·7.

A young bird, a female, is dark brown above, the head streaked with darker, the feathers of the back and wings edged and tipped with very pale rufous or white; forehead, many of the nape feathers, cheeks and chin white, ring round the eye and moustachial streak black, rest of the underparts white to pale rufous with broad longitudinal streaks of blackish-brown; tail dark brown transversely banded with pale rufous to grey.

In this stage it closely resembles a young Hobby (*Falco subbuteo*), but can be distinguished by its long tarsus, considerably exceeding the middle toe (without claw) in length, and by the colour of the claws which are horny or almost white instead of black.

Distribution.—The Western Red-footed Falcon is found in north-east and south-east Europe, and northern Asia, from Finland and Turkey to Lake Baikal. During the northern winter it migrates southwards to eastern and south-western Africa. Within our limits it has only been found in Ovampoland, Damaraland, and Great Namaqualand, where during the rainy season it is exceedingly abundant according to Andersson.

The recorded localities are Omatalo, January, and Otjimbingue, January and February (Andersson in S. A. Mus.).

Habits.—Andersson's account of this bird is as follows: "This pretty Falcon usually arrives in Damaraland and Great Namaqualand about the rainy season and again retires northwards upon the approach of the dry season. During these annual visits it is exceedingly abundant and may be counted by hundreds and by thousands; nay their numbers at times exceed all belief. On one particular occasion, a friend of mine and myself attempted to form a rough approximation to the number of these birds actually within sight, and of the black-and-yellow-billed Kites with which they appeared to be mixed up in about equal proportions. Taking a small section of the sky, we came to the conclusion, by counting and estimating, that there were at least ten thousand individuals; and as the heavens above and all around us appeared to be darkened by a living mass of Kites and Hawks, we set down the aggregate number individually within our view at fifty thousand, feeling at the same time that we were probably below the mark."

“These birds during their stay in Damaraland, feed almost exclusively on white ants, on which they fatten amazingly, as does every other bird or animal that diets upon this insect. Locusts are another favourite kind of food, but less certain.”

512. **Tinnunculus amurensis.** *Eastern Red-legged Kestrel.*

Falco vespertinus var. *amurensis*, *Radde, Reis. Sibir.* ii, p. 102, pl. 1, figs. 1-3 (1863).

Erythropus vespertinus (*nec Linn.*), *Kirk, Ibis*, 1864, p. 316 [Zambesi].
Hypotriorchis concolor, *Gurney, Ibis*, 1866, p. 127.

Erythropus amurensis, *Gurney, Ibis*, 1868, p. 41, pl. 2; *Layard, Ibis*, 1871, p. 227 [Matabeleland]; *Gurney in Andersson's B. Damaraland*, p. 17 (1872); *Ayres, Ibis*, 1873, p. 280, 1877, p. 341 [Potchefstroom]; *Gurney, Ibis*, 1882, pp. 147, 152; *Shelley, Ibis*, 1882, p. 239 [Bechuanaland]; *id. B. Afr.* i, p. 145 (1896).

Cerchneis amurensis, *Sharpe, Cat. B. M.* i, p. 445 (1874); *id. ed. Layard's B. S. Afr.* pp. 66, 801 (1875-84); *Oates, Matabeleland*, p. 299 (1881); *Woodward Bros. Natal B.* p. 152 (1899).

Falco amurensis, *Seebohm, Ibis*, 1887, p. 344 [Natal].

Tinnunculus amurensis, *Marshall, Ibis*, 1900, p. 260 [Salisbury].

Description. *Adult male.*—General colour above, slaty-black, darkest on the head, somewhat paler on the wings and tail; below, bluish-grey, the throat almost white; thighs, abdomen, and lower tail-coverts chestnut; under wing-coverts pure white.

Iris hazel; bill yellowish-horn, blackish at tip; cere, orbits and feet, dark orange, claws yellowish-horn.

Length 12·25; wing 9·0; tail 5·25; culmen 0·80; tarsus 1·25.

The female is lighter than the male, a leaden grey, paler on the wings and tail, most of the feathers obscurely barred with black; primary quills barred with white on the inner web; tail with narrow bars and a much broader subterminal one of black; feathers round the eye, and an indistinct moustachial streak black, rest of the lower surface and sides of the neck creamy-white becoming tinged with rufous on the thighs and under tail-coverts; the breast with conspicuous longitudinal blotches of dark brown, becoming somewhat transverse on the flanks; under wing-coverts white spotted with black.

Length 12·5; wing 9·40.

The young bird is like the female, but has the feathers of the back edged and tipped with fulvous.

Distribution.—The Eastern Red-footed Falcon has a very inter-

esting range; it spends the northern summer in Amoorland, Japan, and North China, where it nests; Leaving the neighbourhood of Peking in September, it passes through India, where it has been regularly observed in Cachar in October and November. It spends our southern summer, from October to March, in South Africa, where it is found in the upper part of Natal, the Transvaal, and Rhodesia. Hitherto curiously enough it does not seem to have been met with in east Africa.

The following are recorded localities: Cape Colony—Knysna (Andersson), King Williams Town (S. A. Mus.); Natal—Near Maritzburg, common in summer (Ayres); Transvaal—Potchefstroom, December, January (Ayres); Bechuanaland—Boatlanami, December (Ayres); Rhodesia—between Bulawayo and Victoria Falls, December (Oates), near Salisbury (Marshall); German south-west Africa—Rare in Damaraland (Andersson); Portuguese east Africa—Zambesi valley (Kirk).

Habits.—Like its western relative the Eastern Red-legged Falcon is a gregarious bird, hunting in companies of twenty to several hundred, and scouring the ground for insects which form its food exclusively. Marshall found in the stomach of one, examined, eighteen Pentatomid bugs, six water beetles, one grasshopper, two winged Carabara ants, and a number of winged termites. They are fond of the neighbourhood of streams and are usually seen in the evening.

Mr. Seebohm observed a flock of perhaps 300 of these Falcons in the early part of March on a farm in the upper part of Natal. They spent the day hawking like Swallows at a great height in the air, and at night roosted all together on the naked branches of some tall trees in the bush.

It is not probable that either this or the previous species will be found breeding in South Africa.

513. *Tinnunculus dickinsoni*. *Dickinson's Kestrel*.

- Falco* (Dissodectes) *dickinsoni*, *P. L. Selater, P. Z. S.* 1864, p. 249; *id. Ibis*, 1864, p. 305, pl. 8; *Kirk, ibid.* p. 316; *Holub & Pelzeln, Orn. Süd-Afr.* p. 28 (1882); *Alexander, Ibis*, 1900, p. 434 [Tete.]
Cerchneis dickersoni, *Sharpe, Cat. B. M.* i, p. 447 (1874); *id. ed. Layard's B. S. Afr.* pp 68, 801 (1875-84); *Reichenow, Vög. Afr. i.* p. 637 (1901).
Dissodectes dickinsoni, *Gurney, Ibis*, 1881, p. 277.
Erythropus dickinsoni, *Shelley B. Afr. i.* p. 145 (1896).

Description. *Adult male.*—Head, neck, and shoulders dark grey with fine black shaft lines; centre of the back and wings black, the primaries barred with white on the inner webs for about three quarters of their length; upper tail-coverts pale silvery-grey; tail the same colour strongly barred with black and tipped with white, the subterminal black band being considerably broader than the others; below, dark grey, darkest on the flanks, nearly white on the under tail-coverts, most of the feathers with black shaft marks; under wing-coverts mottled black and grey.

Iris reddish-brown; bill bluish-black; cere, orbits, and base of lower mandible yellow; legs orange; claws black.

Length 11·5; wings 8·5; tail 5·5; culmen 0·80; tarsus 1·70.

The female is similar in plumage but rather larger; wing 9·0.

The young female bird has a reddish-yellow head and neck, and is a paler grey below.

Distribution.—This, a somewhat rare Hawk, is confined to the southern half of Africa. The type was obtained by Dickinson at Chibisa, on the Shiré river in Nyasaland, and it has also been found in the Zambesi valley, from whence it ranges to Ovampoland and Benguela in the west and to the Rovuma valley in the east.

South African localities are: Rhodesia—Tamafopha, between Bulawayo and the Victoria falls, April (Bradshaw and Holub), Chobe river (Bradshaw in S. A. Mus.), Salisbury (Marshall in litt.); Portuguese east Africa—Tete on the Zambesi, August (Alexander); German south-west Africa—Ochimbora in Ovampoland, November (Eriksson in S. A. Mus.).

Habits.—Little is known of the habits of this Kestrel; Holub states that it preys chiefly on small birds such as weavers and finches, and that it lives in small companies. Anchieta found that it appeared in flocks in August in Caconda, and fed on insects disturbed by grass fires. Mr. Whyte found it nesting in Nyasaland in the fronds of tall palms, and it is probably a resident throughout its range.

Genus III. BAZA.

Type.

Baza, *Hodgson, Journ. A. S. B.* v, p. 777 (1836) *B. lophotes*.

Bill strong, with two distinct teeth on the edge of the upper mandible behind the hook; cere narrow; nostrils elongate and slit-

like with overhanging membrane; head crested; wings moderate, reaching about two-thirds of the way down the tail; feathers of the flanks very long covering the abdomen and thighs; tail square, under tail-coverts long-covering the basal half of the tail-feathers; tarsus very short, feathered in front for about half its length, the bare portion covered with reticulate scales.

This genus, containing some seventeen species, is spread over Africa, including Madagascar and southern Asia, extending eastwards to the Solomon Isles and Australia. Only one out of four African species occurs within our limits.

514. **Baza verreauxi.** *Cuckoo Falcon.*

Aviceda verreauxi, *Lafr. Rev. Zool.* 1846, p. 130; *Gurney, Ibis*, 1864, p. 356 [Natal]; *Layard, B. S. Afr.* p. 24 (1867).

Aviceda cuculoides (*nec Swains.*), *Gurney, Ibis*, 1859, p. 240 [Natal].

Baza verreauxi, *Sharpe, Cat. B. M.* i, p. 354 (1874); *id. ed. Layard's B. S. Afr.* p. 54, pl. i (1875); *Shelley, Ibis*, 1875, p. 66 [Durban]; *Gurney, Ibis*, 1880, p. 463, 1886, p. 297 [Transvaal]; *Shelley, B. Afr.* i, p. 147 (1896); *Woodward Bros. Natal B.* p. 156 (1899); *Marshall, Ibis*, 1900, p. 259 [Mashonaland]; *Woodward Bros. Ibis*, 1900, p. 519 [St. Lucia Lake]; *Reichenow, Vög. Afr.* i, p. 619 (1901).

Description. Adult female.—General colour above, dark slate, nearly all the feathers with concealed white bases, which show here and there, especially about the shoulders; round the back of the neck a chestnut-rufous collar also somewhat concealed by the covering slaty feathers; wing-quills like the back, with about five narrow black cross bars and whitish tips and a good deal of white towards the bases of the inner webs; upper tail-coverts banded with grey and black; tail-feathers with about three alternate bands of pale slaty-grey and black narrowly tipped with white; below, chin, throat and chest pale slaty-grey, lower breast, flanks and thighs white, transversely barred with ochreous-brown; abdomen and under tail-coverts white; quills and tail-feathers nearly white below, with well marked cross bands.

Iris yellow; bill black; cere and feet yellow, claws black.

Length 17; wing 12·0; tail 8·0; culmen 1·10; tarsus 1·35.

The male appears to resemble the female in size and colour, but is a little darker in shade.

A young bird is sepia-brown above, the feathers, especially of the wing and tail, tipped with pale rufous-brown, the tail is barred

light and darker brown; below, white throughout, spotted with drop-shaped ovals of a rufous brown; iris very light brown.

Distribution.—The Cuckoo Falcon is found only in the wooded districts of south and east Africa, extending from the George and Knysna districts of the Colony eastwards through Natal to the Zambesi. Beyond our limits it is met with in east Africa as far north as Mombasa and south Gallaland, including Nyasaland and Angola.



FIG. 92.—*Baza verreauri*. $\times \frac{11}{12}$.

The following are South African localities: Cape Colony—George (Atmore), Knysna (Marais), East London (Wood in S. A. Mus.), Port St. Johns (Shortridge); Natal—Near Durban, common (Shelley), St. Lucia Lake in Zululand (Woodward); Transvaal (Gurney); Rhodesia—Near Salisbury (Marshall).

Habits.—Little has been written on the habits of this Hawk; it frequents dense bush and is very shy; it feeds chiefly on mantids, locusts, and other insects, but occasionally on lizards, such as chameleons; the Woodwards state that it even occasionally kills fowls.

Genus IV. **POLIOHIERAX.**

Type.

Poliohierax, *Kaup, Isis*, 1847, p. 47 *P. semitorquatus*.

Bill very small with a single strongly-marked tooth; nostrils oval without overhanging membrane or central tubercle; wings moderate, the first primary the longest; tail rounded; tarsus long,

only the extreme upper portion feathered in front, the bare portion a good deal longer than the middle toe and claw, covered with polygonal scales, rather larger in front than on the sides or behind; toes weak, claws but little curved.

Only two species of these pigmy falcons are known, the African one here described and another confined to Burma and the Indo-Chinese regions.



FIG. 93.—Foot of *Poliohierax semitorquatus*. $\times \frac{1}{4}$.

515. *Poliohierax semitorquatus*. *Pigmy Falcon*.

Falco semitorquata, *Smith, Rep. Exped. C. Afr.* p. 44 (1836); *id. Illust. Zool. S. Afr. Aves*, pl. i (male) 1838.

Hypotriorchis castanonotus, *P. L. Sclater, Ibis*, 1861, p. 346, pl. xiii (female).

Poliohierax semitorquatus, *Gurney, in Andersson's B. Damaraland*, p. 19 (1872); *Sharpe, Cat. B. M.* i, p. 370 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp.55, 799 (1875-84); *Buckley, Ibis*, 1876, p. 132 [Bamangwato]; *Gurney, Ibis*, 1881, p. 275; *Fleck, Journ. Ornith.* 1894, p. 393 [Reheboth]; *Shelley B. Afr.* i, p. 146 (1896); *Reichenow, Vög. Afr.* i, p. 645 (1901).

Description. Adult male.—General colour above, bluish-grey, a patch of white on the nape, the upper tail-coverts the same colour, primaries and outer secondaries black tipped with white, and with a series of white spots along either web, tail-feathers also

black tipped with white and with four white spots on either web becoming almost complete bars on the outer tail-feathers; below, including the cheeks and under wing-coverts, white throughout.

Iris light brown; bill yellow, darker at the tip; cere yellow to orange; legs red, claws black (Ortlepp).

Length 7.75; wing 4.70; tail 2.85; culmen 0.45; tarsus 1.20; weight $2\frac{1}{2}$ oz. (Ortlepp).

The female differs from the male in having the central portions of the back and scapulars of a rich maroon-red. It is also larger; wing 6.0.

Distribution.—This species was originally discovered by Sir Andrew Smith, who obtained three examples in the neighbourhood of Old Latakoo near Kuruman in the present district of Bechuanaland. It appears to be very rare not only in South Africa but

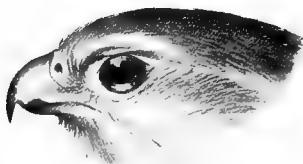


FIG. 94.—*Poliohierax torquatus*. $\times \frac{9}{10}$.

elsewhere. Beyond our limits it is found in the inner, drier portions of East Africa, extending northwards to Gondokoro, Shoa, and Somaliland, but has not hitherto been met with in Nyasaland. The following are the South African localities: Cape Colony—Orange river near Upington, August (Bradshaw), near Kimberley, May (Ortlepp in S. A. Mus.), near Kuruman (Smith); Basutoland (Mrs. Barber in S. A. Mus.); Transvaal (Sharpe and Layard); Bechuanaland—Bamangwato dist. (Buckley); German south-west Africa—Reheboth in Great Namaqualand, December (Fleck), rare in Great Namaqualand and Damaraland (Andersson).

Habits.—Andersson gives the following account:—"It is always met with in pairs and usually perches on bushes or on the lower or middle branches of small trees, though I have seen it on the topmost boughs of lofty trees. I never saw it soar like other Falcons. It is not shy, and when disturbed it never moves further than to the next conspicuous tree or bush. It feeds on small birds, mice, lizards, and coleopterous insects, the latter being, I apprehend, its chief food."

Genus V. **AQUILA.***Type.***Aquila**, *Brisson, Ornith. i, p. 420 (1760)*..... *A. chrysaëtus.*

Bill stout and strong, the culmen evenly curved and longer than the inner toe without claw; the edge of the upper mandible but very slightly curved; nostrils perpendicular ovals, entirely exposed; no occipital crest, wings long and pointed, the difference between

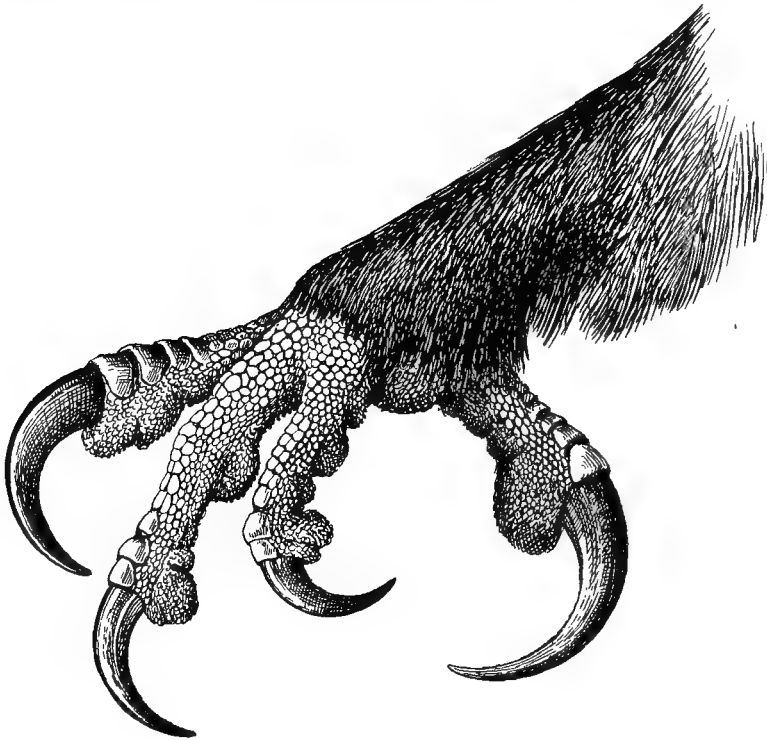


FIG. 95.—Left foot of *Aquila verreauxi*. $\times \frac{1}{4}$.

the length of the primaries and secondaries exceeding the length of the tarsus; tail square or very slightly rounded; tibia much longer than the tarsus; tarsus feathered to the bases of the toes; the outer toe with claw exceeds in length the inner toe without claw; claws powerful, sharp, and curved.

The true eagles are most of them large and powerful birds, and

are distributed all over the Old World except the Malayan and Australian regions, while in the New they are confined to North America north of Mexico.

Three out of six African species inhabit our area.

Key of the Species.

- A. Lower back and rump white; rest of the plumage black *A. verreauxi ad.* p. 292.
- B. Lower back and rump not contrasting with the rest of the plumage.
- a. Larger, wing more than 22; general plumage tawny, more or less mottled with black *A. verreauxi juv.* p. 292.
- b. Smaller, wing less than 21.
- a'. Back chestnut to tawny, contrasting with dark brown wing quills *A. rapax*, p. 294.
- b'. Back and wings sepia brown throughout.
- a². Below, sepia brown *A. wahlbergi ad.* p. 296.
- b². Below, white *A. wahlbergi juv.* p. 296.

516. **Aquila verreauxi.** *Verreaux's Eagle.*

Le Caffre, *Levaill. Ois. d'Afr.* i, p. 28, pl. 7 (1799).

Aquila verreauxi, *Less. Cent. Zool.* p. 105, pl. 38 (1830); *Layard, B. S. Afr.* p. 11 (1867); *id. Ibis*, 1869, p. 70; *Sharpe, Cat. B. M.* i, p. 234 (1874); *id. ed. Layard's B. S. Afr.* pp. 33, 797 (1875-84); *Gurney, Ibis*, 1877, p. 210; *Ayres, Ibis*, 1879, p. 285, 1884, p. 221 [Magaliesberg]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 25 (1882); *Shelley, B. Afr.* i, p. 148 (1896); *Woodward Bros. Natal B.* p. 114 (1899); *Reichenow, Vög. Afr.* i, p. 584 (1901).

Aquila vulturina, *Smith, S. A. Quart. Journ.* i, p. 112 (1830); *Gurney in Andersson's B. Damaraland*, p. 5 (1872).

"Dassievanger" or "Berghaan" of the Dutch colonists. "Nomakwezana" of the Amaxosa (Stanford).

Description. *Adult male.*—General colour above and below black, the centre of the back, rump and upper tail-coverts, except the lowermost, pure white, under surface of the quills below the notch dirty white, especially on the inner webs and with indications of transverse bars.

Iris light brown; bill leaden horn; cere and naked space round the eyes yellow; feet yellow.

Length 33·0; wing 23; tail 11·5; culmen 2·5; tarsus 4·2.

A female is rather larger, length 36·0; wing 25·75; tarsus 4·7.

A young bird has the crown and occiput tawny deepening to chestnut on the upper back; the upper tail-coverts whitish tipped with brown, the wing brown, the coverts, scapulars, and secondaries with much paler edges and tips; tail brown with paler tips; below, the throat and chest is black with traces of tawny edgings to the feathers, this latter increases on the abdomen and lower tail-coverts; the thighs are also brown and pale tawny. Younger birds are clear fawn colour above and below.

Distribution.—Verreaux's Eagle is found in the highlands of Abyssinia and Shoa and reappears in South Africa, but has not hitherto been noticed between these distant points.



FIG. 96.—*Aquila verreauxi*. $\times \frac{2}{3}$.

In South Africa it is fairly common in mountainous districts from Table Mountain to Colesberg; I recently saw a pair within twenty yards of me at Smitwinkel Bay, about five miles south of Simonstown; it breeds in the Drakensberg of Natal whence it comes down to the midland districts of that Colony, and in the Magaliesberg of the western Transvaal, but it is not known from German south-west Africa or Rhodesia.

The following are localities in the Cape Colony—about Table Mountain in the Cape district (Layard and Stark), French Hoek in Paarl and Cedarbergen in Clanwilliam (Stark), Worcester, Caledon, Beaufort West, Colesberg (S. A. Mus.), Albany and Bedford divisions (Grahamstown Museum), Namaqualand (Andersson).

Habits.—This very handsome and powerful bird was first described by Levaillant, but his description is so faulty and his account of its habits so erroneous, that the name *A. vulturina* of Daudin, founded on his work, has usually been ignored by subsequent naturalists. Essentially a bird of the mountains, the Dassievanger may be seen in couples sailing along usually at a height of 1,500 to 2,500 feet above the sea in search of rock rabbits (*Procapra capensis*) which form the greater portion of its nourishment; at times it remains for hours seated on a prominent rock watching; when flying the legs are carried under the tail in contact with it and the feet are closed. In addition to rock rabbits this eagle preys on young goats and lambs, and also occasionally on sickly sheep; it is further stated by the Dutch that when it finds a klipspringer (*Oreotragus saltator*) or even a rhebok (*Pelea capreola*) on the edge of a precipice, it dashes at it with wonderful force and knocking over its victim follows it with such velocity as to reach it almost immediately after it has been killed by its fall on the rocks below. Some inaccessible ledge on a krantz or precipice is usually selected as a site for a nest; this is a huge structure built up of dead sticks, measuring sometimes as much as six feet in height and seven feet across. Here usually in July one or two eggs are laid; these are rough in texture and of a chalky white with a bluish tinge, blotched here and there with irregular spots of dried blood colour; in measurement they average 3.20 × 2.35 but they vary considerably in shape. Stark found a nest in the Cedarbergen in Clanwilliam on August 18, containing one young one covered with white down, while the South African Museum possesses eggs from Frensch Hoek in the Paarl division, obtained many years ago by Mr. Hugo and others from the banks of the Orange river near Norvals Pont, obtained on June 20 by Mr. L. Hobbs.

517. **Aquila rapax.** *Tawny Eagle.*

Falco rapax, *Temm. Pl. Col.* i, pl. 455 (1828).

Aquila senegalla, *Cuv. Règne An.* i, p. 326 (1829); *Layard, B. S. Afr.* p. 10 (1867); *id. Ibis*, 1869, p. 70.

Aquila naevioides, *Cuv. Règne An.* i, p. 326 (1829); *Ayres, Ibis*, 1859, p. 238 [Natal]; *Lilford, Ibis*, 1865, p. 172, pl. v.; *Gurney, in Anderson's B. Damaraland*, p. 6 (1872).

Aquila choka, *Smith, S. Afr. Quart. Journ.* i, p. 114 (1830).

Aquila rapax, *Sharpe, Cat. B. M.* i, p. 242 (1874); *id. ed. Layard B. S. Afr.* pp. 35, 797 (1875-84); *Gurney, Ibis*, 1877, pp. 224-236; *Ayres,*

Ibis, 1878, p. 281 [Potchefstroom]; *Shelley, B. Afr.* i, p. 149 (1896); *Woodward Bros. Natal Birds*, p. 145 (1899); *Reichenow, Vög. Afr.* i, p. 587 (1901).

“Chok” or “Coo vögel” of Dutch (Layard).

Description. *Adult male.*—General colour above, chestnut-brown, the scapulars and some of the wing-coverts dark sepia-brown edged with paler chestnut-brown giving a parti-coloured appearance to that part; wing-quills black, greyish-black on the inner web below the notch, upper tail-coverts whity brown; tail dark ashy-black; below, including the under wing-coverts and thighs, tawny-brown throughout; under side of wing-quills and tail ashy-black.

Iris yellow freckled with brown; bill dark brown, black at the tip; gape and cere chrome yellow; legs chrome yellow, claws black.

Length 27; wing 20; tail 10; tarsus 3.90; culmen 2.45.

The female is larger, length 31.0; wing 22.2.

A young bird is pale tawny above, without the darker centres to the feathers; the wing-quills and tail as in the adult, but the latter showing traces of darker bars; below paler than the adult, almost white on the throat and under tail-coverts; iris brown.

Distribution—The Tawny Eagle is found throughout the greater part of Africa (except the tropical portions of west Africa) from the shores of the Mediterranean to Cape Colony; it occasionally visits southern Europe and perhaps Palestine, but in India is replaced by other allied species. Within our limits it appears to be most abundant in the central part of the Colony and Bechuanaland extending to Great Namaqualand and Damaraland. It is rare in Natal where it appears to be confined to Drakensberg and other mountains and has not been hitherto noticed in Rhodesia.

The following are localities: Cape Colony—Nelspoort in Beaufort West, Colesberg, Port Elizabeth (Layard), Albany, rare (Grahamstown Museum), Middelburg and Barkly West (S. A. Mus.), and Kuruman (Layard); Transvaal—Potchefstroom (Ayres), Limpopo river valley (Holub); Bechuanaland—Eastern Bamangwato (Holub); German south-west Africa—Omaruru (Eriksson in S. A. Mus.).

Habits—This eagle like the last is chiefly found in mountainous and open country where it may be seen soaring aloft at a great height or perched on some conspicuous rock or isolated tree on the look out for its prey. Layard says that it constantly accompanies persons in pursuit of game and that it will carry off wounded dassies, meerkats, and genets, as well as lambs and kids. Mr.

Ortlepp gives an instance of an occasion on which a pair darted down on a flock of merino lambs and ewes and only flew off after having dispatched forty, but this is doubtless unusual. Ayres and Andersson as well as others state that this eagle, contrary to the supposed noble attributes of its tribe feeds on carrion, and the former observer had one brought to him that had frequented for some time the slaughter yard of a Potchefstroom butcher feeding on the offal of cattle and sheep; it possessed to the full the very disagreeable odour and musky smell characteristic of the vultures. It has a shrill cry often heard when the bird is soaring high overhead.

The nest is built in the top of a tree, usually a mimosa, it consists of a large mass of sticks; the eggs are laid early, sometimes even in June; two of these, obtained near Nelspoort in the Beaufort West division by Mr. H. Jackson, are preserved in the South African Museum; they are oval, dirty white, and more or less blotched and spotted with dried blood colour, measuring 2.80 × 2.20.

This bird becomes very tame in captivity. One was kept in the Museum grounds for some time in the open chained to a log; it would almost feed out of one's hand and could be handled by its keeper with ease.

518. *Aquila wahlbergi*. *Wahlberg's Eagle*.

Aquila wahlbergi, *Sundev. Oefvers. K. Vet. Akad. Handl. Stockh.* 1850, p. 109 (1851); *Sharpe, Cat. B. M.* i, p. 245 (1874); *id. ed. Layard's B. S. Afr.* pp. 36, 797 (1875-84); *Bocage, Journ. Ornith.* 1876, p. 308 [Damaraland]; *Gurney, Ibis*, 1877, p. 333; *Shelley and Ayres, Ibis*, 1882, p. 238 [Mashonaland]; *Ayres, Ibis*, 1884, p. 220 [Rustenburg]; *Shelley, B. Afr.* i, p. 149 (1896); *Sowerby, Ibis*, 1898, p. 573 (Fort Chiquaqua); *Marshall, Ibis*, 1900, p. 257 [Mashonaland].

Aquila desmursi, *Hartl. Orn. W. Afr.*, p. 4 (1857); *Gurney, Trans. Zool. Soc.* v, p. 366, pl. 77 (1862); *Layard, Ibis*, 1871 p. 227 [Kuruman].

Hieraëtus wahlbergi, *Reichenow, Vög. Afr.* i, p. 581 (1901).

Description. Adult female.—General colour above and below, dark sepia brown; head with a crest consisting of eight or nine feathers the longest about 1½ inches; primary quills black, paler but not white on their inner webs below the notch; a few black bristles above and below the eye; tail above, brown like the back,

obsoletely barred on the inner web, below, ashy with traces of bands and a darker tip.

Iris hazel; bill horny black, bluish ash at the base; cere and gape very pale greenish-yellow; feet yellow, claws black.

Length 23·5; wing 17·0; tail 9·5; culmen 1·75; tarsus 2·85.

The male is rather smaller, length in flesh 21·0 (Ayres). A young bird is brown above, with paler margins to the feathers; head paler brown with whitish bases to the feathers; sides of the head, face, and neck, and the whole of the under parts white with a few remains of brown bars on the flanks, under tail and under wing-coverts; iris dark brown.

Distribution.—The type of this species, described by Sundevall, was obtained by Wahlberg in “Caffraria superiori, prope 25° lat.” which would correspond to western Transvaal of modern times. More recently it has been met with by Exton at Kuruman* in the Colony, by Ayres at Rustenburg in the Transvaal, and on the Hanyani and Umfuli rivers in Mashonaland; Mr. Monteiro sent an example from Delagoa Bay; Marshall states that it is common near Salisbury; Bocage records examples from Damaraland in the Lisbon Museum.

Beyond our limits it has been noticed in southern Angola, German east Africa and north-east and west Africa, but has not yet been found in Nyasaland.

Habits.—Ayres found this bird singly or in pairs in the Magaliesbergen where it was not uncommon and where it appears to feed chiefly on lizards and snakes; on one occasion he relates that his brother found a pair which had killed and partly devoured a large poisonous snake probably a species of Cobra (*Naia*); on another occasion in Mashonaland he found a whole swallow (*Hirundo dimidiata*) in the crop of an individual.

Mr. Marshall thus describes the nesting habits in Mashonaland:—“Mr. C. Timmler recently shot a fine female, as she left her nest. This latter was a large structure of sticks in the strong fork of a large tree about twenty feet from the ground, and was built with roots, grass, and a few green leaves. The single egg was dirty white, with large pale blotches of brownish-grey; it measures 60 × 48 mm. (*i.e.*, 2·35 × 1·90).” An egg in the South African Museum obtained by Mr. Eriksson near Huilla in Mossamedes corresponds very well with these measurements, but is very fairly

* This specimen, still preserved in the South African Museum, is labelled Kanye.

freckled with very pale brown. In this case too, the nest was built in a large tree and composed of sticks lined with leaves and contained only one egg a little incubated.

Genus VI. EUTOLMAËTUS.

Eutolmaëtus, *Blyth, J. A. S. B.* xiv, p. 174 (1845) *Type.* *E. fasciatus.*

Bill moderately strong and hooked, the ridge of the culmen being about equal to the length of the inner toe without claw; edge of the upper mandible slightly festooned; sometimes a slight occipital crest; other characters as in *Aquila*, to which this genus is very closely allied.

The Hawk-eagles range over southern Europe and Asia as far as Australia and over the whole of Africa. Out of four African species three come within our limits.

Key of the Species.

- A. Smaller, wing 13 to 17
 - a. Below white streaked with brown *E. pennatus ad.* p. 298.
 - b. Below sepia brown streaked with darker *E. pennatus juv.* p. 298.
- B. Medium, wing 17 to 19
 - a. Below, white streaked with brown..... *E. spilogaster ad.* p. 299.
 - b. Below, tawny rufous streaked with brown *E. spilogaster juv.* p. 299.
- C. Larger, wing 23 to 25
 - a. Below, chin and chest brown, rest of under parts white spotted with brown *E. bellicosus ad.* p. 301.
 - b. Below, white throughout..... *E. bellicosus juv.* p. 301.

519. **Eutolmaëtus pennatus.** *Booted Eagle.*

Falco pennatus, Gmel. Syst. Nat. i, p. 272 (1788).

Aquila pennata, Layard, B. S. Afr. p. 10 (1867); *id. Ibis*, 1869, p. 361; *Butler, Feilden, and Reid, Zool.* 1882, p. 460 [Newcastle].

Hieraëtus pennatus, Gurney, in Andersson's B. Damaraland, p. 7, (1872); *Reichenow, Vög. Afr.* i, p. 580 (1901).

Nisaëtus pennatus, Sharpe, Cat. B. M. i, p. 253 (1874); *Dresser, B. Eur.* v, p. 461, pls. 336, 7 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 37, 797 (1875-84); *Gurney, Ibis*, 1877, p. 419; *Ayres, Ibis*, 1886, p. 263 [Rustenburg]; *Shelley, B. Afr.* i, p. 149 (1896).

Description. Adult female.—Crown of the head and nape pale tawny with dark brown shaft stripes; back and wings brown, most of the feathers with creamy white mottlings and edgings; lower

portion of the upper tail-coverts white ; wings very dark brown above and below ; tail dark brown slightly tipped with white, with traces of four or five darker bars ; under parts white with dark brown shaft stripes on the throat and chest and traces of tawny mottlings on the thighs and under tail-coverts ; under wing-coverts white streaked and spotted with dark brown ; wing-quills black ; tail-feathers ashy below.

Iris pale brown ; bill bluish-black, pale bluish at the base ; cere and gape wax yellow ; feet pale wax yellow.

Length about 23·0 ; wing 15·4 ; tail 8·25 ; culmen 1·5 ; tarsus 2·1. The male is smaller, wing 13·25 ; tail 7·5 ; tarsus 2·1.

The young bird is darker above, the feathers of the head are dark brown edged with dark rufous ; the under parts and cheeks are dark brown throughout with black shaft streaks, the thighs and under tail-coverts a little paler.

Some birds retain the dark brown under parts for a long time and even breed in this plumage.

Distribution.—The Booted Eagle is found throughout southern Europe and Asia as far as Ceylon and Burma ; it is also spread over north-eastern and southern Africa, though nowhere very abundantly. Within our limits it has been noticed in the following localities : Cape Colony—Cape div. (S. A. Mus.), Berg river where it breeds, Nelspoort in Beaufort West, Swellendam and Grahams-town (Layard) ; Natal—Newcastle (Feilden) ; Transvaal—Rustenburg (Ayres) ; German south-west Africa—Ondonga (Andersson). It has further been obtained in Nyasaland but not hitherto in Angola or German east Africa.

Habits.—The only account of the habits of this somewhat rare bird in South Africa is that of Mr. Layard. He states that it was found breeding in the Berg river in September by Messrs. Cootze and Melck ; the nests are placed in trees and are lined with green leaves ; the clutch usually consists of two eggs of dirty white ground colour slightly smeared and freckled with pale brown. They measure 2·45 × 1·90.

Like others of this genus it appears to be a highly predatory species feeding on small mammals and birds.

520. **Eutolmaëtus spilogaster.** *African Hawk-Eagle.*

Spizaëtus spilogaster, *Bp. Rev. Mag. Zool.* 1850, p. 487 ; *Layard, B. S. Afr.* p. 14 (1867).

Spizaëtus ayresii, *Gurney, Ibis*, 1862, p. 149, pl. 4 [Natal] ; *id. Ibis*, 1864, p. 356.

Aquila bonellii, (*nec Less.*), *Layard, B. S. Afr.* p. 11 (1867).

Aquila fasciata (*nec Vieill.*), *Gurney, Ibis*, 1868, p. 138.

Pseudaëtus spilogaster, *Gurney, in Andersson's B. Damaraland*, p. 7 (1872).

Nisaëtus spilogaster, *Sharpe, Cat. B. M. i.*, p. 252 (1874); *id. ed. Layard's B. S. Afr.* pp. 38, 797 (1875-84); *Gurney, Ibis*, 1877, p. 421; *Ayres, Ibis*, 1884, p. 219 [Rustenburg]; *Bryden, Gun and Camera*, p. 65 (1893) [near Mafeking]; *Shelley, B. Afr. i.*, p. 149 (1896); *Marshall, Ibis*, 1900, p. 262 [Mashonaland].

Hieraëtus spilogaster, *Reichenow, Vög. Afr. i.*, 579 (1901).

Description. Adult female.—Above, brownish-black, the head streaked with white, and sometimes slightly crested; back, scapulars and wing-coverts conspicuously varied with large spots of white; primaries ashy on the outer web very dark brown at the tips, the secondaries mottled with brown or ashy with dark brown tips, upper tail-coverts banded and tipped with white; tail ashy grey with a dark brown tip and remains of darker bars, cheeks and under surface of the body pure white with black streaks on the cheeks and breast and irregular large spots on the under tail-coverts; under wing-coverts black, some of the feathers margined with white.

Iris bright yellow; bill bluish-black at tip, base of the lower mandible yellow; cere bright yellow; feet yellow; claws black.

Length 26·5; wing 18·3; tail 11·4; culmen 1·9; tarsus 3·9.

The adult male is very similar to the female but the white spots on the upper surface are less distinct, and the streaks on the lower surface more distinct. Wing 17·25; tail 10·75; tarsus 3·70.

A young bird is brown above, the feathers on the head and nape edged with rufous and with concealed white bases; there is very little white on the scapulars and wings except at the tips and on the inner webs of the secondaries; under parts including the cheeks and sides of the neck tawny rufous, darkest on the breast; chin, sides of the neck and breast with conspicuous dark brown shaft stripes; lower under wing-coverts dark brown, others tawny; wing and tail feathers white below with traces of bars.

Iris light yellow; bill ashy-black at the tip; cere and feet greenish-yellow.

Distribution.—This Eagle was first obtained in north-east Africa where it is found in Somaliland, Abyssinia, and along the Blue Nile as far north as Khartoum. It has also occurred in German east Africa, Nyasaland, and southern Angola. In South Africa though widely spread it is apparently rare as it has only been obtained on very few occasions, as follows: Cape Colony—Cape div. (Layard),

near Mafeking (Bryden); Natal (Ayres); Transvaal—Rustenburg (Ayres); Rhodesia—Near Salisbury (Marshall); German south-west Africa—Otjimbingue, Omanes river, Omaruru, Ondonga (Andersson).

Habits.—This Hawk Eagle is a bold and fearless bird of heavy but powerful flight; it perches on rocks and trees and is fond of returning to the same post of observation. Mr. Ayres gives a good account of its habits as follows:—“This Eagle swooped down from the mountain and seized a Rameroon pigeon, which my brother had wounded; he fired at it and missed, but it only flew a few yards and settled on a dead tree, evidently not liking to give up its prey, and remaining there till he loaded again and shot it. Another of these eagles caught a full grown fowl and ate it within a foot of my brother’s house. This Eagle is exceedingly destructive to poultry; descending from the highest parts of the mountains it skims quietly close to the ground and covered by any convenient clump of bushes or trees it alights on the ground as near as it can, and running among the grass seizes an unhappy fowl from amongst the lot and proceeds to eat it on the spot. It is very quick on the wing, and though very fearless when hungry, is generally shy and difficult to approach.

Mr. Marshall writes to me in regard to the breeding habits of this bird. The nest, which he examined consisted of the usual rough platform of sticks placed in a fork of a tree on the banks of the Suro-suro river about 30 feet from the ground; the female was shot from the nest which contained one egg. This egg presented by Mr. Marshall to the South African Museum is oval and somewhat rough, of a dirty white colour slightly blotched with very pale brown; it measures 2.4×1.95 .

521. *Eutolmaëtus bellicosus.* *Martial Eagle.*

Le Griffard, *Levaill. Ois. d'Afr.* i, p. 1, pl. 1 (1799).

Falco bellicosus, *Daud. Traité*, ii, p. 38 (1800).

Aquila bellicosa, *Smith, S. Afr. Quart. Journ.* i, p. 112 (1830); *id. Ill. Zool. S. Afr. Aves*, pl. 48 (1840); *Gurney, Ibis*, 1861, p. 129 [Natal].

Spizaëtus bellicosus, *Layard, B. S. Afr.* p. 13 (1867); *Sharpe, Cat. B. M.* i, p. 265 (1874); *id. ed. Layard's B. S. Afr.* p. 40 (1875); *Kirby, Haunts Wild Game*, p. 21 (1896); *Reichenow, V.g. Afr.* i, p. 576 (1901).

Nisaëtus bellicosus, *Gurney, Ibis*, 1877, pp. 419-422; *Ayres, Ibis*, 1884, p. 219 [Potchefstroom]; *Symonds, Ibis*, 1887, p. 325 [Kroonstad]; *Shelley, B. Afr.* i, p. 149 (1896).

Description. Adult female.—General colour above, dark sepia brown, some of the feathers especially the scapulars and wing-coverts edged and tipped with paler; a slight crest, not always apparent in the preserved skin; wing quills with traces of darker bars; tail like the back slightly tipped with white and with four to five ashy cross bars; below, chin, chest, and flanks, brown like the back, rest of the underparts pure white sparingly spotted with round blotches of brown; under wing-coverts dark brown mottled and tipped with white; wing-quills dark brown, ashy on the basal halves of the inner webs, tail ashy with seven dark bars below.

Iris bright yellow; bill black; cere yellowish-green; feet yellowish-white.

Length 33·0; wing 25·0; tail 12·0; culmen 2·8; tarsus 4·70.

Male.—A young bird is much paler above, nearly all the feathers have paler edging and tips, while the crown and nape is mottled dark brown and white; the tail is strongly tipped with white and crossed by eight to nine ashy bars; below, pure white throughout except for a patch of brown on either side of the chest and on the feathers covering the humerus; under wing-coverts white, tail ashy-white below, with seven to ten dark brown transverse bars. Iris brown.

The nestling is covered with white down.

Distribution.—This fine bird is found throughout the greater part of the Ethiopian region from Senegal and Abyssinia southwards to Cape Colony.

Hitherto it does not appear to have been noticed in Rhodesia; otherwise, though nowhere common, it seems to be widely spread.

The following are localities: Cape Colony—Caledon, George and Grahamstown (S. A. Mus.), Knysna, Port Elizabeth, and Colesberg (Layard); Natal—Only once (Gurney); Orange River Colony—Kroonstad (Symonds); Transvaal—Potechefstroom (Ayres), Lydenburg district (Kirby); Bechuanaland—Near Lake Ngami (Baines); German south-west Africa—Otjimbingue (Andersson).

Habits.—These handsome and powerful birds are very destructive to young goats and lambs which they kill by coming down on them with tremendous rapidity and striking them with their formidable hind claws so as to rip them completely open; they also prey on steenboks (*Rhaphicercus campestris*), blaauwboks (*Cephalophus monticola*), hares and meerkats. As a rule they carry off their booty to devour at their nest or eyrie, where quantities of remains

are generally to be found. Mr. Ayres found a nest on June 10 in the Orange River Colony; it was about five feet in diameter, built of sticks and lined with fresh green twigs and placed in an old gnarled tree on the side of a hill; it contained only one somewhat incubated egg; this was chalky white, blotched and spotted with reddish brown and rather rounded in shape, measuring 3.3×2.55 .

A nest was also found by Symonds on September 20, which contained one young bird in down. It was placed in a mimosa tree overhanging the river and was easily accessible. After watching the nest for some weeks in the hope of obtaining the parent birds without success, the young one was taken away and kept for some time in captivity. It became fairly tame and allowed one to enter its cage and scratch its head. Sir Harry Johnson also kept a Martial Hawk-eagle for some time; he relates, as proving the great strength of the bird, how, on one occasion when playing with the bird, a cat approached; in a second the eagle had darted out a foot and had driven its claws through the cat's skull killing it instantaneously.

Genus VII. **SPIZAËTUS.**

Type.

Spizaëtus, Vieill. *Analyse*, p. 24 (1816) *S. mauduyti*.

Bill somewhat short and deep, the culmen evenly curved throughout its length, edge of the upper mandible slightly festooned; nostrils oblique ovals entirely free from feathers or

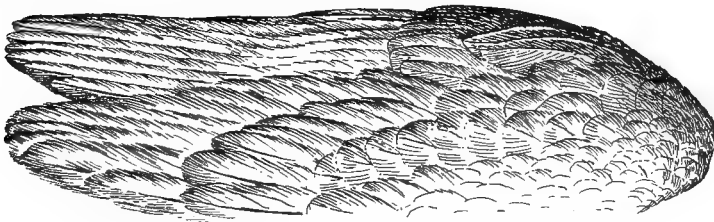


FIG. 97.—Wing of *Spizaëtus coronatus*. $\times \frac{1}{2}$.

bristles; a small occipital crest of short but broad feathers; wings short and rounded, only reaching to just beyond the upper tail-coverts; difference between the length of the primaries and secondaries hardly noticeable (in South African species); tail

rather long and square; tarsus feathered to the base of the toes; toes curved and sharp-pointed, that of the hind toe the longest.

This is a genus of forest-eagles found in Central and South America, Africa, and South Asia, as far as Japan and Celebes. The only African species is here described.

522. *Spizaëtus coronatus*. *Crowned Hawk-Eagle*.

Falco coronatus, *Linn. Syst. Nat.* 12th ed. i, p. 124 (1766).

Le Blanchard, *Levaill. Ois. d'Afr.* i, p. 12, pl. 3 (1799).

Aquila coronatus, *Smith, S. Afr. Quart. Journ.* 2nd ser. p. 273 (1834); *id. Ill. Zool. S. Afr. Aves* pls. 41, 42 (1840).

Spizaëtus coronatus, *Gurney, Ibis*, 1861, p. 129, 1863, p. 331 [Natal]; *Layard, B. S. Afr.* p. 12 (1867); *Gurney, Ibis*, 1868, p. 139; *Layard, Ibis*, 1869, pp. 71, 362; *Sharpe, Cat. B. M.* i, p. 266 (1874); *id. ed. Layard's B. S. Afr.* p. 39 (1875); *Gurney, Ibis*, 1877, pp. 423, 434; *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 26 (1882); *Shelley, B. Afr.* i, p. 149 (1896); *Woodward Bros. Natal B.* p. 145 (1899); *Reichenow, Vög. Afr.* i, p. 576 (1901).



FIG. 98.—*Spizaëtus coronatus*. $\times \frac{2}{3}$

Description. *Adult female*.—Above, black, the feathers of the occipital crest edged with white, round the neck from the throat to the nape a collar of smoky-brown; primaries ashy-black at the tip, white on the basal half of the inner web, a dark brown spot on the inner webs at the junction of the ashy and white; tail ashy-grey with three broad black cross bars and a slightly paler tip. Under-

parts black, the feathers of the breast and under tail-coverts banded with white, those of the breast with a rufous tinge in addition, so that the whole is much mottled, thighs and tarsal feathers also mottled black and white but the black spots much smaller; under wing-coverts rufous.

Iris yellow; bill black; cere dusky; gape yellow; feet yellow.

Length 36·0; wing 20·25; tail 13·75; culmen 2·60; tarsus 4·0.

The male is smaller; wing 17·75; tail 12·0; tarsus 3·80.

A young bird has the crown, sides of the head and throat pure white; the feathers of the back, wings and upper tail-coverts are pale ashy-brown with well-developed white margins and occasional dark brown spots and shaft marks; the wing-quills are much as in the adult but rather lighter; tail ashy, conspicuously tipped with white and with five black cross bands instead of three, above and below; under parts white, the breast and flanks with pale rufous centres to the feathers; thighs and tarsal feathers at first pure white, but very early developing the spotting so characteristic of the adult bird; under wing-coverts pale rufous.

Iris greyish-brown.

Distribution.—Essentially a forest-loving bird, this Hawk-Eagle is by no means common in South Africa and is only found in the southern and eastern districts of the Colony and in Natal, so far as our present knowledge goes; beyond our limits it has been obtained in Angola and west Africa and probably extends throughout the great forest-districts of the interior.

South African localities are: Cape Colony—Frensch Hoek in the Paarl div. (Layard), Knysna (Levaillant and S. A. Mus.), Albany div. (Stark); Natal—Clairmont near Durban, Karkloof near Howick (Woodward), Maritzburg (Fitzsimmons).

Habits.—This Hawk-Eagle, easily distinguished even on the wing by its long tail and short rounded wings, is a bold and rapacious bird attacking and killing animals a good deal larger than itself, such as monkeys, pigs, cats, lambs, and geese, as well as blue bucks, and rock-rabbits or dassies. It drops on its prey from above, waiting patiently for hours for a chance of so doing and descending with a heavy swoop; at other times it may be seen hovering in the air stationary, head to wind, with wings partly drawn in and then slowly gliding on again and hunting over the ground.

Dr. Stark was shown a fine nest of this bird by Mr. R. H. Ivy near Grahamstown in 1897. This nest is said to have been occu-



FIG. 99.—Nest of *Spizaëtus coronatus*, from a photograph taken by Dr. A. C. Stark.

ped for thirty years and the eggs were taken in 1895, 1896, and 1897. Two visits were made by Dr. Stark, on September 25, and October 3, to the locality; it is in a deep gap between grassy hills with rocky sides, and the bottom is filled with thick bush and large trees. In one of these, a Kaffir plum (*Harpephyllum caffrum*), was the nest; it was fixed in a crutch of four branches about 58 feet above the ground and 20 feet from the top of the tree; it was shaped somewhat like a globe with the upper portion cut off so that the upper edge falls in instead of being spread out as is the case with some large nests, and measured about 9 feet across and 9 feet in depth. The lower part was untidy with projecting sticks, the upper portion more neatly constructed. Lying on a bed of green leaves plucked from the Kaffir plum tree itself in a slight depression were two white and very rounded eggs, one of which was found to be slightly more incubated than the other. Below the nest at the foot of the tree the ground was covered with blotches of white droppings mingled with which were the skulls of rock rabbits and blue bucks. The accompanying figure is drawn from a photograph taken on the spot with one of the parent birds on the nest by Dr. Stark.

Genus VIII. LOPHOAËTUS.

Type.

Lophoaëtus, *Kaup, Isis*, 1847, p. 163 *L. occipitalis*.

Bill moderate, nostrils somewhat more rounded than in *Spizaëtus*; occipital crest well developed consisting of some half dozen narrow elongated feathers, some of which are from 4 to 5 inches long; wings moderately long and pointed, the difference between the primaries and secondaries about equal to the length of the tarsus; tail nearly square; tarsus rather long and slender and feathered throughout.

This genus contains only one species and is confined to Africa.

523. **Lophoaëtus occipitalis.** *Crested Hawk Eagle.*

Le Huppard, *Levaill. Ois. d'Afr.* i, p. 8, pl. 2 (1799).

Falco occipitalis, *Daud. Traité*, ii, p. 40 (1800).

Morphinus occipitalis, *Smith, S. A. Quart. Journ.* 1st ser. p. 115 (1830).

Spizaëtus occipitalis, *Grill, K. Vet. Akad. Handl.* ii, no 10, p. 50 (1858) [*Knysna*]; *Gurney, Ibis*, 1859, p. 238 [*Natal*]; *Kirk, Ibis*,

1864, p. 315 [Zambesi valley]; *Layard, B. S. Afr.* p. 13 (1867); *id. Ibis*, 1869, p. 71.

Lophoaëtus occipitalis, *Sharpe, Cat. B. M.* i, p. 274 (1874); *id. ed. Layard's B. S. Afr.* p. 41 (1875); *Gurney, Ibis*, 1877, p. 422; *W. Ayres, Ibis*, 1887, p. 48 [Zoutspansberg]; *Rendall, Ibis*, 1896, p. 166 [Barberton]; *Shelley, B. Afr.* i, p. 149 (1896); *Woodward Bros. Ibis*, 1895, p. 22 [Zululand]; *id. Natal B.* p. 146 (1899); *Reichenow, Vög. Afr.* i, p. 582 (1901).

"Kuifkop Valk" of Dutch colonists; "Black Hawk" of Natal Colonists; "Isipumongati" (*i.e.* fool) of the Zulus (Woodward).

Description. *Adult male.*—General colour dark chocolate-brown; a long crest of eight or ten narrow feathers 4 to 5 inches in length on the occiput the same colour; primaries white on the basal half, pale brown on the distal half, tipped and crossed by bars of blackish brown; tail dark brown crossed by four or five bars of paler brown becoming almost white on the basal bars and on the inner



FIG. 100.—*Lophoaëtus occipitalis*.

webs; underparts including the thighs brown; legs white (streaked with brown in younger birds); under wing-coverts dark brown and white; wing-quills and tail below white, banded with dark brown.

Iris bright yellow to hazel; bill bluish-black; cere pale yellow; toes pale yellow, claws black.

Length 23·0; wing 15·25; tail 8·5; culmen 1·8; tarsus 4·0.

The female is of much the same size; length 24·0; wing 15·25; tail 8·5; tarsus 4·0.

Distribution.—This bird is found over the greater part of the Ethiopian region, especially in the more wooded districts from Senegal and Abyssinia southwards.

Within our limits it is restricted to the southern and eastern portions of the Colony, to Natal, the eastern portion of the Transvaal and to the Zambesi valley. It was not met with by Andersson in Damaraland.

The following are localities: Cape Colony—George (Atmore), Knysna (Victorin), Albany, Stockenstroom, Port Elizabeth and East London (Layard), Port St. John's (S. A. Mus.); Natal—Durban to Maritzburg and Zululand (Woodward); Transvaal—Near Barber-ton (Rendall), Oliphants river in Zoutspansberg (W. Ayres).

Habits.—This remarkable bird can be distinguished at a glance by its long crest, which is usually erected when it is perched, and by its white legs, which are conspicuous against its chocolate-brown plumage. It is found chiefly in wooded districts intersected by rivers and may be frequently espied seated on a bare post or conspicuous position watching for its prey, which consists of small mammals such as rats, lizards, frogs, and toads. It is by no means bloodthirsty and seldom if ever kills other birds. When disturbed it makes off for but a short distance, being the reverse of shy, and has hence acquired its Zulu name. It has a loud piercing shriek to which it often gives vent when flying high in the air and wheeling round and round.

No one appears to have recorded any observations on the nesting habits of the Crested Hawk Eagle except Levillant; he states that it builds in trees and that the nest is lined with wool and feathers; two eggs, almost round, spotted with reddish-brown, form the clutch.

Genus IX. **HALIAËTUS.**

Type.

Haliaëtus, *Savign. Syst. Ois. d'Egypte*, p. 254 (1810). ...*H. albicillus*.

Bill stout, the edge of the upper mandible distinctly festooned, nostrils rounded ovals with a bony margin; sides of the face from round the eye to the cere bare of feathers; a crest of lanceolate feathers; wings somewhat rounded, the difference between the primaries and secondaries about two-thirds the length of the tarsus; tail short, about one-third the length of the wings, which just about reach the tip; tarsus feathered about half way down in front, the bare portion not so long as the middle toe and covered with six to eight transversely enlarged scutes; claws long, sharp, curved, and grooved beneath.

Some ten species of this genus are known, distributed over the coasts and larger rivers of all the continents except South America. Only one species, here described, inhabits Africa proper though a second is found in Madagascar.

524. **Haliaëtus vocifer.** *Sea Eagle.*

Le Vocifer, *Levaill. Ois. d'Afr.* i, p. 17, pl. iv (1799).

Falco vocifer, *Daud. Traité*, ii, p. 65 (1800).

Haliaëtus vocifer, *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 50 (1858) [Knysna]; *Gurney, Ibis*, 1859, p. 238, 1862, p. 36 [Natal];

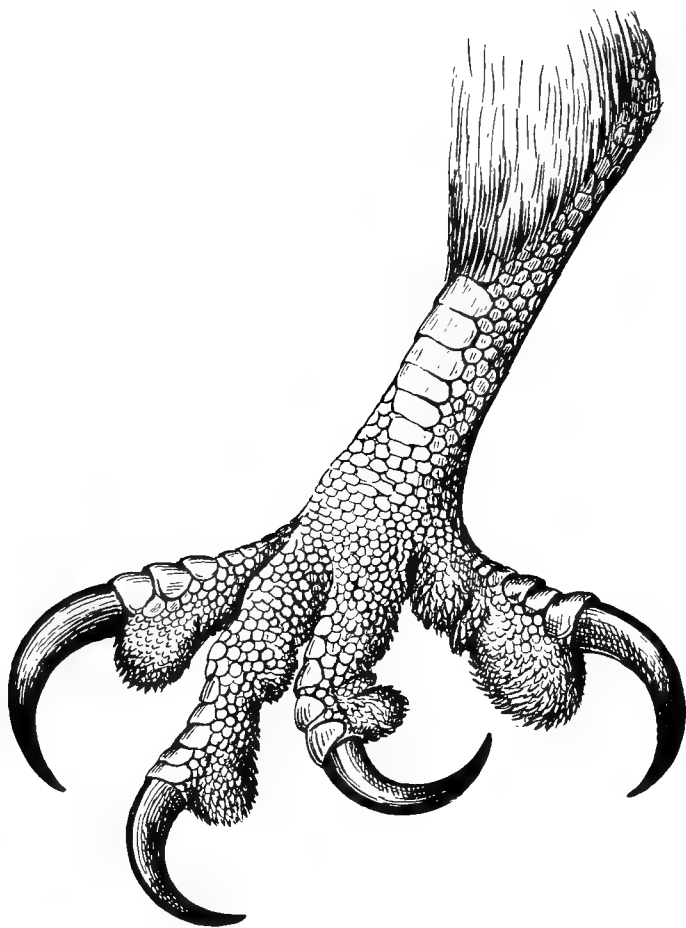


FIG. 101.—Foot of *Haliaëtus vocifer*. $\times \frac{3}{4}$.

Kirk, Ibis, 1864, p. 315 [Upper Zambesi]; *Layard, B. S. Afr.* p. 17 (1867); *id. Ibis*, 1869, p. 71; *Gurney in Andersson's B. Damara-land* p. 9 (1872); *Sharpe, Cat. B. M.* i, p. 310 (1874); *Buckley, Ibis*,

1874, p. 360 [Limpopo]; *Sharpe, ed. Layard's, B. S. Afr.* pp. 46, 798 (1875-84); *Ayres, Ibis*, 1877, p. 340 [Potchefstroom]; *Gurney, Ibis*, 1878, p. 453; *Shelley, Ibis*, 1882, p. 238 [Mashonaland]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 26 (1882) [Upper Zambesi]; *W. Ayres, Ibis*, 1887, p. 48 [Zoutspansberg]; *Bryden, Gun and Camera*, p. 66 (1893) [Botletli river]; *Fleck, Journ. Ornith.* 1894, p. 393; *Millais, Breath from the Veldt*, pp. 142, 173 (1895) [Bubye river]; *Shelley, B. Afr.* i, p. 148 (1896); *Woodward Bros. Ibis*, 1898, p. 223 [Zululand]; *id. Natal, B.* p. 148 (1899); *Marshall, Ibis*, 1900, p. 259 [Mashonaland]; *Alexander, Ibis*, 1900, p. 435 [Zambesi]; *Reichenow, Vög. Afr.* i, p. 605 (1901).
 "Groote Visch-vanger" of Dutch; "Oudekeloek" at Knysna (Marais); "Inkwazi" of Zulus (Woodward).



FIG. 102.—*Haliaëtus vocifer*. $\times \frac{3}{4}$.

Description. Adult male.—Head, neck, upper part of the back, breast, and tail pure white; rest of the upper surface including the wings black, except the least coverts which are deep rufous, as is also the abdomen, under tail- and under wing-coverts; wing-quills bluish-black below.

Iris yellow; bill black, yellow at base; cere yellow; legs yellow. Length 28·0; wing 20·5; tail 7·75; culmen 2·60; tarsus 3·50.

The female is larger, wing 22·0; tail 8·25; tarsus 4·20.

The young bird, which Mr. John Wood tells me does not acquire its mature plumage till the third summer, is brown above with white edgings and frecklings to many of the feathers, especially on the hind neck and upper tail-coverts; tail white with brown

frecklings and a terminal dark brown patch; below white with broad dark brown stripes on the breast and less defined brown patches on the abdomen, thighs, and under tail-coverts.

Iris very dark brown; feet whitish-yellow.

Distribution.—This Eagle is spread all over Africa south of the Sahara, from Senegal and the Upper Nile southwards, where suitable conditions occur.

In South Africa it is found along the coasts and extends up the larger rivers, and is fairly abundant in most parts of the country where such exist. It has not been met with, so far as I am aware, near Cape Town.

The following are localities: Cape Colony—Bredasdorp (Layard), Knysna (Victorin and Marais), Port Alfred in Bathurst and Sterkstroom (Grahamstown Mus.), Buffalo river (Rickard and Wood), St. John's river (Shortridge), Orange river (Layard and Bradshaw); Natal—Near Durban (Millar), Lidgetton (Fitzsimmons), Ifafa and Pongola river in Zululand (Woodward); Transvaal—Lehtaba river in Zoutspansberg (W. Ayres), Limpopo (Buckley), near Potchefstroom (T. Ayres); Bechuanaland—Botletli river (Andersson and Bryden); Rhodesia—Upper Zambesi (Kirk and Holub), Bubyee river (Millais); German south-west Africa—Okavango river (Andersson).

Habits.—This handsome bird is chiefly found along the coasts of South Africa especially at inlets and river-mouths, where it finds its prey. Hovering above the water or watching from a fixed post it suddenly darts with a violent rush on its finny victim, and grasping it with its powerful claws bears it away to devour at leisure at its post, either a rock or a bare tree, below which can often be found a considerable accumulation of fish bones and other *débris*.

Layard states that it occasionally carries off wounded ducks or other wild fowl, while Ayres found it near Potchefstroom feeding on carrion with the vultures and crows, though the Vaal river with plenty of fish in it was not far off. It is a bold and powerful bird and robs ospreys, pelicans and kites of their booty and also drives away crows from carcasses. The Sea Eagle has a very low and piercing cry which can be heard at a great distance, sometimes when circling high in the air, sometimes when perched, in which case its head is seen to be thrown back and its throat swollen with the great effort.

Layard received an egg from a correspondent taken from a nest

built in a tree on one of the islands in the Orange river, he describes it as white with fine grain and not so pointed as that of a turkey.

It also breeds at Knysna and on the Pongola river in Zululand, building a large nest of sticks in a big tree. Mr. John Wood tells me that in the neighbourhood of East London he has found a nest placed in a tree near the river containing two young birds.

Mr. Millar has sent me the following account of the habits of this bird near Durban: "The remarkable call of this fine eagle may still be heard at Durban as several pairs frequent the bay and even nest on the 'bluff' slopes facing the town.



FIG. 103.—Nest of *Haliaëtus vocifer*, from a photograph taken by Mr. A. D. Millar.

"On August 19, 1899, I discovered a nest on the 'bluff' overlooking the bay which contained one young bird recently hatched and an addled egg. In the nest were remnants of fish in different degrees of putrefaction, giving it an offensive odour.

"On August 19, 1900, I visited the same locality and found the birds had built in an adjoining tree, last year's nest having fallen with a portion of the bough which supported it. The new nest was difficult to get at being on a perpendicular Cabbage tree (*Cus-*

sonia sp.) about 25 feet high. The next day the nest was again visited, and on climbing an adjoining tree two young birds were visible stretching and sunning themselves.

“The present year (1901) on June 29, I again made an excursion to the same place but found the cabbage tree had fallen down and that the birds had built in an adjoining and also most inaccessible tree. However, the difficulties being overcome I found it contained two eggs, hard set, which would have been hatched in the course of a few days.

“A month later on July 29, I found the birds had returned and one egg was laid, and on August 3 there were two. The nest was then photographed at a short distance, as owing to the surroundings it could not be taken from far off, but the photograph (fig. 103) gives a good idea of its massive structure and of the enormous amount of material utilised ; it measures about 5 feet across.”

The clutch evidently consists of two eggs only ; these are white and somewhat rough, measuring about 3·0 × 2·25.

Genus X. **HELOTARSUS.**

Type.

Helotarsus, *Smith, S. Afr. Quart. Journ.* 1st ser.

p. 110 (1830) H. ecaudatus.

Bill rather short, the edge of upper mandible almost straight ; nostrils, long, perpendicular ovals quite free from bristles ; front part of face from the eye to the cere bare of feathers or bristles ; head crested ; wings long and pointed, difference between the length of the primaries and secondaries far exceeding the length of the tarsus ; tail excessively short, about a quarter the length of the wings, which extend a long way beyond its extremity ; tarsus bare behind clothed with feathers in front for about half its length ; the bare portion covered with small, somewhat rounded and swollen scales throughout.

Only one species, spread over the greater part of Africa, is now generally recognised.

525. **Helotarsus ecaudatus.** *Bateleur.*

Le Bateleur, *Levaill. Ois. d'Afr.* i, p. 31, pls. 7, 8 (1799).

Falco ecaudatus, *Daud. Traité*, ii, p. 54 (1800).

Helotarsus typus, *Smith, S. A. Quart. Journ.* 1st ser. p. 110 (1830).

Helotarsus ecaudatus, *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10.

p. 51 (1858) [Knysna] ; *Gurney, Ibis*, 1859, p. 238, 1862, p. 35

[Natal]; *Layard, B. S. Afr.* p. 18 (1867); *Gurney, Ibis*, 1868, p. 140; *Heuglin, Orn. Nordost Afr.* p. 80, pl. 2 (1869); *Gurney in Andersson's B. Damaraland*, p. 10 (1872); *Sharpe, Cat. B. M.* i, p. 300 (1874); *Buckley, Ibis*, 1874, p. 360 [Matabeleland]; *Sharpe, ed. Layard's B. S. Afr.* pp. 48, 798 (1875-84); *Gurney, Ibis*, 1878, p. 353; *Shelley, Ibis*, 1882, p. 238 [Tati river]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 27 (1882); *Symonds, Ibis*, 1887, p. 324 [Kroonstad]; *Bryden, Gun and Camera*, p. 65 (1893); *Fleck, Journ. Ornith.* 1894, p. 393; *Millais, Breath from the Veldt*, pp. 117, 317, sketches (1895); *Shelley, B. Afr.* i, p. 148 (1896); *Sowerby, Ibis*, 1898, p. 574 [Mashonaland]; *Woodward Bros. Natal B.* p. 148 (1899); *Marshall, Ibis*, 1900, p. 258 [Mashonaland]; *Alexander, ibid.* p. 436 [Zambesi valley]; *Woodward Bros. ibid.* p. 519 [Zululand]; *Reichenow, Vög. Afr.* i, p. 598 (1901).

“Berghaan” of the Colonists, a name often applied to other large birds of prey.



FIG. 104.—*Helotarsus ecaudatus*. $\times \frac{2}{3}$.

Description. Adult female.—Head, which is strongly crested, cheeks, sides of the neck and the whole of the underparts rich glossy black; centre of the back, inner scapulars, upper and under tail-coverts, and tail rich maroon-chestnut; shoulders and wing-coverts except the greater series silvery-brown; greater wing-coverts, primary and secondary wing-quills and scapulars blue-black; the secondaries are sometimes silvery and tipped with black perhaps in not quite adult birds, perhaps in the female as suggested by Gurney, under wing-coverts and axillaries white.

Iris brown; bill, base dark orange, middle portion yellow, tip black; cere and space round orbit coral coloured, sometimes orange-yellow; feet coral-red.

Length 24·0; wing 21·0; tail 4·25; culmen 2·10; tarsus 3·1. The male is slightly smaller.

The young bird is dark brown above, with fawn coloured margins to the feathers, the head and neck somewhat lighter; secondaries washed with bronzy-brown slightly tipped with rufous; tail black shaded with brown tipped with rufous; underparts brown with light edgings to the feathers, more rufous on the breast and whitish-brown on the abdomen; thighs blackish.

Iris brownish-yellow; bill brown, black at tip; cere bluish; feet yellowish.

A form of this bird in which the rich maroon of the back is replaced by creamy fulvous or white, but which differs in no other respect from the type, has been considered to represent a distinct species (*H. leuconotus*) by some authors. Others have suggested that the white backed form may be the fully adult bird. Whether this latter suggestion is the real explanation or not, there seems to be hardly sufficient grounds for specific separation of these two forms, the more so as their distributional areas are co-terminous.

Distribution.—The Bateleur is found over the greater part of Africa, south of the Sahara from Senegal and Abyssinia southwards, including British and German east Africa, Nyasaland and Angola. In South Africa it appears to be most common in German territory and Rhodesia, though occurring in the Transvaal, Natal, and the Colony in some districts. The following are localities: Cape Colony—Knysna (Victorin), Orange River (Bradshaw), Kimberley (Holub), Kuruman (Smith), Mafeking dist. (Bryden); Natal—near Durban (Ayres), midland districts and St. Lucia Lake in Zululand (Woodward); Orange river Colony—Near Kroonstad (Symonds); Transvaal—Zoutspansberg (Millais); Bechuanaland—Near Lake Ngami (Chapman); Rhodesia—Tati river (Ayres), Salisbury district (Marshall), Upper Zambesi (Bradshaw); German south-west Africa—Great Namaqualand and Damaraland (Andersson and Fleck).

Habits.—The Bateleur is one of the most characteristic South African birds; it can be easily recognised even on the wing by its very short stumpy tail and by its coral-red legs. It derives its name of Bateleur (*i.e.*, Harlequin or Mountebank) from its curious way of turning somersaults in the air; it also has a habit of swinging from side to side with first one wing up and then the other,

keeping the wings rigid and rather turned up over the back. Mr. Millais states that when this bird is hunting instead of watching for its prey in front or immediately below it appears to hold its head tightly compressed over its crop, so as to look backwards



FIG. 105.—*Helotarsus ecaudatus* flying.

through its legs over ground already passed over. The voice is a loud single scream usually heard at the pairing season when the birds are in the air. There can be no doubt that in addition to their usual diet of small mammals and reptiles these birds readily feed on carrion; Sowerby saw a young bird feeding on a dead mule,

and Mr. Hutchinson has observed them eating carrion along with the vultures. Though also said to attack poultry, Layard, who kept a specimen in his fowl house for some time, found that it did not interfere with his hens though it robbed the nests of the eggs. Bryden found a nest of the Bateleur on the Setlegoli river near Mafeking; it was placed in one of the highest and thorniest acacia trees in the neighbourhood; the nest, which was constructed of dry sticks, contained one large creamy-white egg. Andersson gives a similar account of the nesting habits of the species in Damaraland.

Genus XI. GYPOHIERAX.

Type.

Gypohierax, Rüpp. *N. Wirbelth.*, p. 46 (1835) *G. angolensis*.

Bill small, compressed at the sides, not toothed, nostrils perpendicular ovals entirely free from bristles; lores and ring round the eye, and a line on either side of the throat bare of feathers and bristles; wings long, reaching the end of the tail, which is short, about half the length of the wing and rounded; tarsus longer than the middle toe, covered with small hexagonal scales; clothed only in front on its upper portion.

This genus was formed for the reception of a single species—the Angola Vulture of Pennant. Its bare face and black and white plumage give it some external resemblance to the vultures of the genus *Neophron*, but most modern authors place it in the present family near the other Fishing Eagles. The single species is confined to the tropical coasts of west and east Africa.

526. **Gypohierax angolensis.** *Vulturine Sea Eagle.*

Falco angolensis, *Gmel. Syst. Nat.* i, p. 252 (1788).

Gypohierax angolensis, *Gray Gen. Birds* i, p. 7, pl. 4 (1844); *Sharpe, Cat. B. M.* i, p. 312 (1874); *Ayres, Ibis*, 1877, p. 340 [Potchefstroom]; *Gurney, Ibis*, 1878, p. 458; *Sharpe, ed. Layard's B. S. Afr.* p. 798 (1884); *Shelley, B. Afr.* i, 148 (1896); *Reichenow, Vög. Afr.* i, p. 603 (1901).

Description. *Adult male.*—General colour white, scapulars black, except the very highest which are mottled with white; quills black, the primaries mostly white, except the tips which are black, and the outer web which is more or less mottled with black, the inner

web less so; tail black with a broad white tip forming a terminal band; all the rest of the body white; head slightly crested.

Iris yellow to white; bill bluish; cere yellowish-pink; bare skin of face flesh colour; legs dirty pink.

Length 23·0; wing 17·12; tail 8·8; culmen 2·5; tarsus 3·35.

The female is similar but larger; length 24·5.

The young bird is brown with lighter tips to the feathers, especially on the head and neck; the wing-quills blackish-brown; the tail also blackish-brown with light brown tips.

Distribution.—The Vulturine Sea Eagle is found along the sea coast and at the mouths of rivers in tropical Africa from Gambia to Angola on the west, and on the east only on the German east African coast; it also occurs on Lake Nyasa. Within our limits it has been only once obtained by Mr. T. Ayres at Potchefstroom. This specimen, an immature bird in brown plumage, is preserved in the Norwich Museum.



FIG. 106.—*Gypohierax angolensis*. $\times \frac{2}{3}$.

Habits.—This Eagle was formerly placed among the vultures chiefly on account of its bare face and black and white plumage, in which respects it resembles the members of the genus *Neophron*; it has, however, the prehensile feet, rough soles and sharp talons of the true sea eagles, and is best placed in their immediate neighbourhood.

The Vulturine Sea Eagle preys on fishes, on which it descends on the surface of the water, also on crabs and other crustaceans. It is also very fond of the outside portion of the fruits of the oil palm,

in search of which it often wanders to a considerable distance from water.

The example obtained by Ayres, which must have been a strayed bird, was shot when perched on a willow tree in the village of Potchefstroom; its stomach was empty.

Genus XII. GYPAËTUS.

Type.

Gypaëtus, *Storr, Alpenreise*, i, p. 69 (1784) *G. barbatus*.

Bill high, compressed; culmen rounded throughout and hooked; basal half of the bill, including the nostrils, which are longitudinal ovals, entirely covered with coarse black bristles; a tuft of similar bristles on the chin; wings very long and powerful; tail also long and strong, wedge-shaped and pointed, the difference in length between the inner and outer feathers about equal to the length of the tarsus; tarsus feathered to the toes or to within an inch of them; claws moderate, curved, and blunt.

This genus is found in the mountain ranges of southern Europe, central Asia and Africa.

Only two species are recognised, the one here described and the true Lämmergeyer of Switzerland, which is distinguished by its completely feathered tarsus and black-streaked cheeks.

527. **Gypaëtus ossifragus.** *Southern Lämmergeyer.*

Phene ossifraga, *Savign. Syst. Ois. d'Egypte*, p. 245 (1809).

Gypaëtus barbatus (*nec Linn.*), *Smith, S. A. Quart. Journ.* i, p. 105 (1830).

Gypaëtus meridionalis, *Keys. and Blas. Wirb. Europ.* p. 28 (1840); *Rüpp. Syst. Uebers.* p. 9, pl. 1 (1845); *Gurney, Descript. Cat. Rapt. Birds*, p. 87 (1861); *id. Ibis*, 1864, p. 346 [Natal]; *Layard, B. S. Afr.* p. 2 (1867); *Gurney, Ibis*, 1868, p. 147; *Bryden, Kloof and Karoo*, p. 147 (1889); *Reichenow, Vog. Afr.* i, p. 601 (1901).

Gypaëtus ossifragus, *Sharpe, Cat. B. M.* i, p. 230 (1874); *id. ed. Layard's B. S. Afr.* pp. 32, 797 (1875-84); *Shelley, B. Afr.* i, p. 148 (1896); *Woodward Bros. Natal B.* p. 145 (1899).

"Årend" (*i.e.*, eagle) or "Lammervanger" of the Dutch; "Ukozi," "Olukulu" (also applied to other large eagles) of the Amaxosa (Stanford).

Description. *Adult male.*—Crown and centre of the head white becoming tawny on the occiput and rufous on the neck; patch

round the eye extending forward to the nostrils, together with the bristles covering the nostrils and the bunch of chin bristles, black, but the ear-coverts and cheeks pale tawny; the feathers round the neck are somewhat lanceolate and form a ruff; rest of the upper surface including the tail, ashy black, darkest on the edges of the feathers and white along the shafts; below, including the thighs, tawny-rufous, darkest on the upper breast, under tail-coverts tawny tipped with pale brown, feathering of the legs extending about three-fourths of the length of the tarsus, not reaching the bases of the toes.

Iris yellow surrounded by red; bill pale black, cere and base bluish; feet ashy.



FIG. 107.—*Gypaëtus ossifragus*. $\times \frac{1}{2}$.

Length about 44; wing 31; tail 19.5; culmen 3.8; tarsus 4.20.

A young bird has the head and neck all round, including the ruff, blackish; the bristles on the face and chin hardly developed; the rest of the upper surface brown, darkest on the wing- and tail-quills, the shafts of which are conspicuously white; below, except the throat, which is black, pale brown throughout. Iris hazel brown.

Distribution.—The Southern Lammergeyer replaces the European bird in Africa (except in the Atlas mountains where the European bird is said to be found); it has been obtained in Egypt, Nubia, Abyssinia and South Africa, but does not appear to have been hitherto noticed in East Africa.

This bird is seldom seen far away from the mountains, and it is along the southern ranges from Wellington eastwards and in the Drakensberg that it has chiefly been observed.

The following are the principal localities recorded : Cape Colony—Bain's Kloof in the Paarl division, Nelsport in Beaufort West, Swellendam, George and Graaff Reinet (Layard), Willowmore (Bryden), Caledon (S. A. Mus.); Natal—Inanda, near Durban (Ayres), Bushman Pass, near Escourt (Stark); Transvaal—Lydenburg (Ayres).

Habits.—The Lammervanger is almost entirely confined to mountain ranges and appears to be nowhere very common in South Africa; it is usually seen singly or in pairs circling about at a great height in search of food; its flight is very powerful and swift; while on the ground it closely resembles the Pharaoh's Vulture (*Neophron*) in gait and habits. Its food consists chiefly of carrion and bones, which it is stated to be able to digest with great ease and rapidity; Ayres found the vertebræ of an ox as well as the remains of a dassie (*Procavia*) in the stomach of one examined by him; it is also said to kill sickly lambs and sheep, but the stories which are told of its attacking men and full-grown sheep appear to be devoid of foundation.

No observations appear to have been made in regard to the breeding habits of this bird in South Africa, but the allied European species builds a large nest of sticks lined with soft material on some inaccessible ledge of rock and lays only one egg of a pale but lively brownish-orange.

Many legends are told about this remarkable-looking bird; the ancients believed that it carried bones too large to swallow up into the air and then let them drop in order to break them, and from this habit gave it the name "Ossifragus" (*i.e.*, bone breaker). The late Col. Bowker wrote that among the Boers it is supposed to be the raven let out of the Ark, and that it is considered very unlucky to do it any injury; family sickness, insolvency, loss of cattle and sheep, are all evils likely to befall anyone who interferes with it. The European species differs from the present one in having the tarsus feathered right down to the toes.

Genus XIII. CIRCAËTUS.

Type.

Circaëtus, *Vieill. Analyse*, p. 23 (1816) C. gallicus.

Beak strong, with regularly curved culmen and a very nearly straight margin to the upper mandible; nostrils oblique ovals with an osseous margin and partially covered by a few loreal bristles;

head slightly crested; wings and tail as in *Asturinnula*; tarsus with the lower two-thirds at least bare, covered with small reticulate scales throughout; toes short, claws small but sharp.

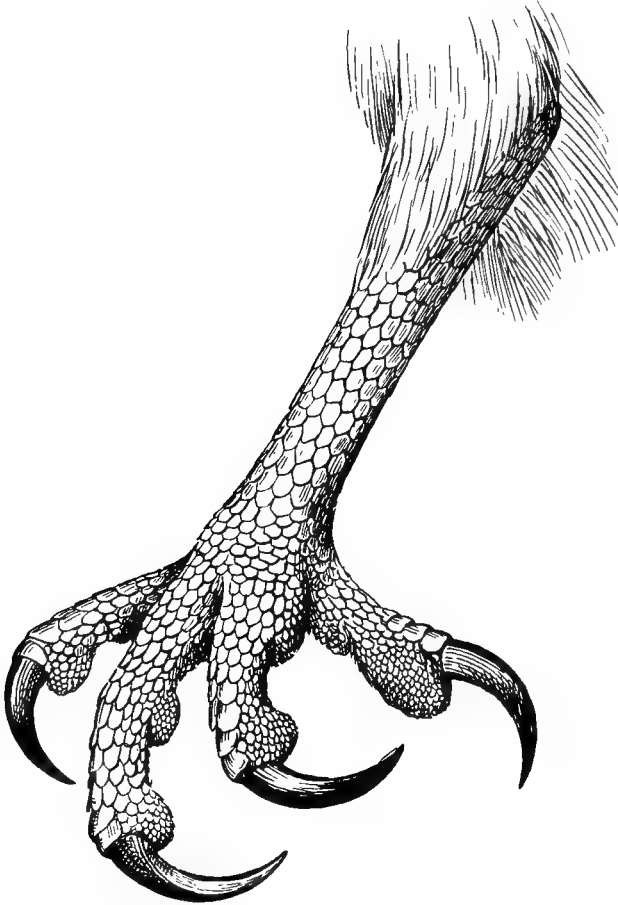


FIG. 108.—Foot of *Circaetus pectoralis*. $\times \frac{4}{3}$

One species of this genus is found in southern Europe and Asia, and winters in north Africa; the other five are confined to Africa, and of these two only are found within our limits.

Key of the Species.

- A. Larger wing 21 to 22.
 a. Below, chest sepia-brown, abdomen white *C. pectoralis*, ad. p. 324.
 b. Below, tawny-rufous, sometimes with shaft lines..... *C. pectoralis*, juv. p. 324.
 B. Smaller wing about 14; below, chin white, chest brown, abdomen white, barred with dark brown *C. fasciolatus*, p. 326.

528. *Circaëtus pectoralis*. *Black-breasted Harrier Eagle*.

Circaëtus pectoralis, *Smith, S. Afr. Quart. Journ.* 1st ser. p. 109 (1830); *Gurney, Ibis*, 1868, p. 139; *id. in Andersson's B. Damara-land*, p. 10 (1872); *Ayres, Ibis*, 1874, p. 105, 1877, p. 341, 1878, p. 281, 1880, p. 257, 1885, p. 242, 1886, p. 282 (Potchefstroom); *Gurney, Ibis*, 1878, pp. 150, 164; *Shelley, B. Afr. i*, p. 150 (1896); *Woodward Bros. Natal B.* p. 147 (1899); *Marshall, Ibis*, 1900, p. 257 [Salisbury]; *Reichenow, Vög. Afr. i*, p. 572 (1901).

Circaëtus thoracicus, *Less. Traité*, p. 48 (1841); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 50 (1858); *Gurney, Ibis*, 1859, p. 238, 1860, p. 203 [Natal]; *Verr. & des Murs, Ibis*, 1862, p. 209; *Layard, B. S. Afr.* p. 15 (1867).

Circaëtus cinereus (*nec Vieill.*), *Sharpe, Cat. B. M. i*, p. 282 (1874) [in part]; *id. ed. Layard's B. S. Afr.* pp. 43, 797 (1875-84).

Description. Adult.—Above, dark brown, some of the feathers of the wing and tail-coverts with paler edges and tips; quills very dark brown, white on the basal half of the inner web; tail tipped with white and with three dark cross bands, the interspaces becoming white on the inner webs of the outer feathers; sides of the neck, throat, and chest dark brown; rest of the underparts pure white; wings white below, only the tips of the quills brown, no bars; tail white below with three cross bars.

Iris light yellow; bill blackish; cere and gape olive-yellow, (bluish-white apud Marshall); legs dingy white.

Length 29·0; wing 21·0; tail 10·5; culmen 2·1; tarsus 3·75.

The female is slightly larger than the male, wing 22·0; tail 12·5; tarsus 3·85.

A young bird is much paler brown above; the head and neck are dirty white with brown shaft stripes; tail very dark brown with very faint traces of darker bars; below, including the under wing-coverts, tawny-rufous, palest on the sides of the neck and throat, where there are traces of darker shaft lines; ear-coverts greyish-brown; on the abdomen and under tail-coverts the tawny is varied

with white mottling. In an intermediate stage the underparts are brown much varied with white. The nestling is covered with white down.

Distribution.—This Harrier Eagle is apparently confined to south and east Africa, though Gurney in his long discussion on the relations of this species with the true *C. cinereus* gives references to accounts of specimens from Senegal and Abyssinia.

In South Africa at any rate the Black-breasted Harrier Eagle is widely distributed throughout, as shown by the following recorded localities: Cape Colony—Malmesbury, George, Beaufort West, Albany and Bathurst divisions (Layard), Oudtshoorn (Victorin), Kuruman (Gurney); plentiful in Natal (Woodward); Transvaal—Potchefstroom in winter (Ayres); Rhodesia—Fort Chiquaqua (Sowerby), Salisbury (Marshall); Damaraland (Andersson).



FIG. 109.—*Circaëtus pectoralis*. $\times \frac{3}{4}$.

Habits.—This bird is not very common in the Colony and is found chiefly in mountainous districts where there is timber and water. It is wild and somewhat shy and may be seen soaring at a great height in the air. It is said to be destructive to lambs and also preys on poultry, but there is no doubt that its food consists chiefly of reptiles and frogs and especially of snakes. Ayres found in the stomach of one killed by him in Natal the remains of a poisonous snake, the Mamba (*Dendraspis angusticeps*), which could

not have been much less than 7 or 8 feet long; other collectors have met with the same experience.

Layard found this bird breeding on the Berg river, building in the top of dense bushes and laying a single pure white egg measuring 3.1×2.4 ; Jackson sent similar eggs from Nelspoort in Beaufort West; near Potchefstroom Ayres found nests in thorn trees, also containing only a single egg.

Mr. Marshall writes as follows: "This fine Eagle is relatively common round Salisbury and two or three individuals may generally be observed within a few miles of the town during the summer. It is a comparatively fearless bird, though generally managing to keep just out of gun shot. It frequents open country especially in the vicinity of water and searches its ground very thoroughly from a considerable altitude; it settles very frequently even on low trees and will often haunt one particular spot for some little time. It is interesting to see this large bird hovering just like a Kestrel far up in the air; it resembles a Kestrel also in the way it descends on its prey, which is generally taken on the ground, its downward flight being comparatively gentle, and not headlong like the magnificent swoop of the Bateleur. Stomachs contained mice, snakes, lizards and beetles."

529. *Circaëtus fasciolatus*. *Banded Harrier Eagle*.

Circaëtus fasciolatus, Gray, *Cat. Accipitr.* p. 18 (1848) (desc. nulla); Gurney, *Ibis*, 1861, p. 130, 1862, p. 35, pl. 3 [Natal]; Verr. & des Murs, *Ibis*, 1862, p. 211; Gurney, *Ibis*, 1868, p. 139; Sharpe, *Cat. B. M.* i, p. 285 (1874); *id. ed. Layard's B. S. Afr.* p. 45 (1875); Gurney, *Ibis*, 1878, p. 148; Shelley, *B. Afr.* i, p. 150 (1896); Woodward Bros. *Natal B.* p. 147 (1899).

Spilornis fasciolatus, Kaup, *Contrib. Ornith.* 1850, p. 72.

Description.—General colour above, brown; below, throat and chest light brown; chin white; rest of the underparts white banded with brown; tail yellowish-brown with four or five bands of dark brown; tip edged with white.

Iris yellow; bill black; cere and legs yellow.

Length 25.0; wing 14.6; tail 10.5; tarsus 3.4.

Distribution.—This Harrier Eagle is a rare bird in South Africa; up till recently it was supposed to be confined to Natal whence came the type, and a few other examples all obtained in the coast districts by Ayres and others. Recently, however, it has been

obtained by Böhm and Neumann near Bagamoyo and Tanga on the coast of German east Africa and by Mr. Alfred Sharpe in Nyasaland.

Habits.—Little is known about the habits of this rare Eagle. The first specimen described by Mr. Gurney is stated by the collector, Mr. Gueinzus to have been “stuffed full of termites.” On the other hand Neumann found a snake in the stomach of one opened by him.

Genus XIV. **ASTURINULA.**

Type.

Asturinula, *Finsch & Hartl. Vög. Ost-Afr.* p. 59

(1870) A. monogrammica.

Bill somewhat small, edge of the upper mandible slightly festooned, culmen rounded throughout; nostrils rounded with an entire bony margin and central tubercle; wings pointed, the difference between the primaries and secondaries exceeding considerably the length of the tarsus; tail very slightly rounded; tarsus bare for about its lower two-thirds, which portion is about equal to the middle toe without claw, covered in front with a single row of large transverse scutes.

This genus contains only one species spread over the greater part of the Ethiopian region.

530. **Asturinula monogrammica.** *African Buzzard Eagle.*

Falco monogrammicus, *Temm. Pl. Col.* i, pl. 314 (1824).

Kaupifalco monogrammicus, *Gurney in Andersson's B. Damaraland*, p. 26 (1872).

Asturinula monogrammica, *Sharpe, Cat. B. M.* i, p. 277 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 42, 797 (1875-84); *Gurney, Ibis*, 1876, p. 484; *Ayres, Ibis*, 1879, p. 285, 1884, p. 219 [Rustenburg]; *W. Ayres, Ibis*, 1887, p. 47 [Zoutspansberg]; *Marshall, Ibis*, 1896, p. 241 [Salisbury]; *Shelley, B. Afr.* i, p. 151 (1896); *Sharpe, Ibis*, 1897, p. 495 [Zululand]; *Sowerby, Ibis*, 1898, p. 574 [Fort Chiquaqua]; *Woodward Bros. Natal Birds*, p. 147 (1899); *Marshall, Ibis*, 1900, p. 257; *Alexander, Ibis*, 1900, p. 437 [Zambesi Valley].

Kaupifalco monogrammicus meridionalis, *Reichenow, Vög. Afr.* i, p. 549 (1901).

Description. Adult female.—Above, slaty-grey becoming almost black on the rump; upper tail-coverts white; quills like the back

slightly tipped with white and obscurely cross-banded with brown, white on the basal half of the inner webs; tail slaty-black crossed by a subterminal bar of white and with a second white bar on the inner web of all but the two central feathers; sides of the neck and chest like the back, chin and throat white with a central streak of black; under tail-coverts white, rest of the under surface narrowly barred with white and dark grey.

Iris lake to rich red; bill black, cere and gape rich orange to cinnamon-red; legs orange to red.

Length 15.25; wing 9.0; tail 6.75; tarsus 2.15; culmen 1.1. The male is a little smaller, wing 8.5; tail 5.40; tarsus 1.9.



FIG. 110.—*Asturina monogrammica*. $\times \frac{1}{2}$.

A young bird has a good deal of brown on the chest and brown margins to many of the wing-coverts and scapulars; iris brown.

Distribution.—Throughout the Ethiopian region from Senegal and Abyssinia southwards to the Transvaal and Natal. This Buzzard Eagle is only found in the northern portion of our area and does not become at all common until Mashonaland is reached. It has not hitherto occurred in Cape Colony. The following are recorded localities: Natal—Clairmont near Durban and North Dene near Durban on May 24, 1897 (Durban Mus. and S. Afr. Mus.), Pongola river in Zululand (Woodward); Transvaal—Rustenburg in January, June and August (Ayres), Buffels in Zoutspansberg (W. Ayres); Rhodesia—Salisbury (Marshall), Fort Chiquaquu (Sowerby); German south-west Africa—Elephants vlei (Andersson); Portuguese east Africa—Tete on the Zambesi (Alexander).

Habits.—Little attention has been paid to the habits of this bird.

Mr. Marshall gives the following account: "Fairly common and more readily approachable than any of our larger Hawks. It prefers to keep well within the bush, and is somewhat lethargic in its habits, the flight being comparatively heavy. The following are the contents of the stomach of a single bird: 2 scorpions, 2 large centipedes, 4 larvæ of a large cetonid beetle, and 4 locusts; in addition the crop was crammed with 130 winged specimens of our largest termites. This species seems specially partial to scorpions and centipedes, either one or the other having been observed in almost every specimen; one also contained a small viperine snake."

Nothing is known about its breeding habits so far as I am aware.

Genus XV. BUTEO.

Type.

Buteo, *Cuv. Leçon d'Anat. Comp.* i, table 2 (1800) ... *B. vulgaris*.

Culmen sharply but evenly down-curved; edge of the upper mandible but slightly curved; nostrils oval and oblique, without bony tubercles; wings long and pointed nearly reaching the tip of the tail, the difference in length between the primaries and secondaries far surpassing the tarsus; tail long and slightly rounded; tibia much longer than the tarsus; tarsus quite bare behind, feathered in front (in South African species) for only about a quarter of its length; covered before and behind with a row of transverse plates.

Plumage very variable, with dark, pale and rufescent variations apparently not entirely dependent on age.

This is a large genus found all over the world except in the Indo-Malayan and Australasian regions. Out of six African species two are well known throughout South Africa, and a third just enters our limits.

Key of the Species.

- A. Head and upper parts black.
- a. Underparts black with a rufous breast more or less mottled with white..... *B. jakal*, *ad.* p. 330.
 - b. Underparts white or black, no rufous *B. augur*, p. 333.
- B. Head and upper parts brown.
- a. Larger, wing more than 15, below, rufous-brown slightly streaked with darker..... *B. jakal*, *juv.* p. 330.
 - b. Smaller, wing less than 15, below, either uniform smoky-brown or white, or more or less mottled with smoky-brown *B. desertorum*, p. 333.

531. *Buteo jakal*. *Jackal Buzzard*.

Le Rounoir, *Levaill. Ois. d'Afr.* i, p. 73, pl. 16 (1799).

Falco jakal, *Daud. Traité*, ii, p. 161 (1800).

Buteo jakal, *Smith, S. Afr. Quart. Journ.* i, p. 239 (1830); *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 49 (1858) [Knysna]; *Gurney, Ibis*, 1859, p. 240, 1860, p. 204 [Natal]; *Layard, B. S. Afr.* p. 8 (1867); *Gurney in Andersson's B. Damaraland*, p. 11 (1872); *Sharpe, Cat. B. M.* i, p. 173 (1874); *id. ed. Layard's B. S. Afr.* pp. 26, 796 (1875-

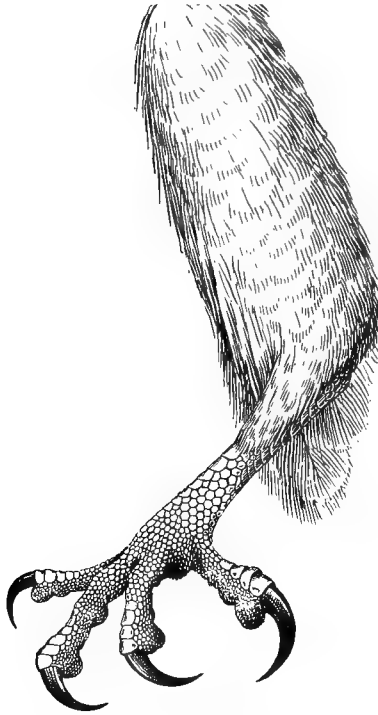


FIG. 111.—Foot of *Buteo jakal*. $\times \frac{2}{3}$.

84); *Barratt, Ibis*, 1876, p. 195; *Gurney, Ibis*, 1876, p. 469; *Ayres, Ibis*, 1877, p. 340, 1880, p. 257 [Potchefstroom]; *Oates, Matabeleland*, p. 298 (1881); *Butler, Feilden, and Reid, Zool.* 1882, p. 169; *Shelley, B. Afr.* i, p. 150 (1896); *Woodward Bros. Ibis*, 1898, p. 219 [Zululand]; *id. Natal B.* p. 143 (1899); *Marshall, Ibis*, 1900, p. 256 [Mashonaland]; *Reichenow, Vög. Afr.* i, p. 591 (1901).
 "Jakkals vogel" of the Dutch. "Inhlandhlokazi" of the Zulus (Woodward).

Description. Adult male.—Above, black, most of the feathers with concealed white bases ; primaries ashy becoming black toward the tip, the greater part of the inner webs below the notch pure white, secondaries ashy to white with narrow bands of dark brown broadly tipped with black ; tail-feathers rich rufous with black subterminal spots more or less developed ; below, the chin, throat, and sides of the breast, black, centre of the breast rich rufous ; abdomen, thighs, and under tail-coverts black mingled with white and rufous ; tail very pale rufous below ; the coloration of the under surface varies a good deal, white often predominates over the rufous of the breast and also shows on the chin ; these are probably not quite adult birds.



FIG. 112.—*Buteo jakal*. $\times \frac{9}{16}$.

Iris grey-brown to yellow ; bill dark brown, tip black ; cere and gape yellow ; tarsus yellow ; claws black.

Length 21·5 ; wing 15·5 ; tail 7·5 ; culmen 1·5 ; tarsus 3·6.

The female resembles the male but is larger, length 23·0 ; wing 16·5 ; tarsus 3·6.

A nestling in the South African Museum is covered with white down, only the wing feathers which are dark brown are beginning to sprout.

A young bird is brown above, with paler and in some cases more rufous edgings to the feathers ; wings as in the adult ; the tail-feathers are like the back but tinged with rufous towards the base, and show traces of narrow transverse bars disappearing towards the

tip; below, pale rufous, darker on the sides of the neck, chest, and thighs, where the black feathers are beginning to appear.

Distribution.—The Jackal Buzzard is one of the commonest birds of prey in South Africa; it is very abundant throughout the Colony, Natal, the Orange River Colony and the Transvaal, but becomes rarer in Rhodesia; though occasionally found in Great Namaqualand it is unknown, according to Andersson, in Damaraland or further north, nor has it yet been recorded from north of the Zambesi.

The following are definite localities: Cape Colony—Cape, Worcester, Caledon, Swellendam and Beaufort West (S. A. Mus.), Knysna (Victorin), Albany common (Grahamstown Mus.), Port Elizabeth and East London plentiful (Rickard and Wood), Port St. John's, (S. A. Mus.); Natal—Newcastle (Oates), Pinetown (Stark), and Zululand (Woodward); Orange River Colony—Near Bloemfontein (Barratt); Transvaal—Lydenburg (Barratt), Potchefstroom (Ayres); Rhodesia—Near Salisbury (Marshall).

Habits.—This species derives its name from its shrill cry which is something like that of the black-backed Jackal (*Canis mesomelas*). It is a common bird and is often seen seated motionless on a solitary tree or some prominent rock; hence it keeps a good lookout for its prey which it takes from the ground; sometimes it will hunt over the ground alternately flying and hovering, and swooping down with great force; though a heavy flyer it sometimes ascends to a great height in widening circles uttering its loud characteristic cry.

This bird lives chiefly on small mammals, lizards, snakes, and frogs; although this has been disputed, it occasionally kills game birds. Ayres found a snipe in the stomach of one, and Butler observed a pair stoop at a brace of Francolin and capture one of them. When flying they keep their legs stretched out underneath their tails.

Butler found a nest near Newcastle in Natal on July 30; it was placed in a bush growing out of a rock on the side of a cliff about six feet from the top; the nest was constructed of sticks well lined with tufts of grass and green leaves; it contained two eggs, one plain white, the other marked at the large end with light yellowish-brown.

Stark found a nest at Hoetjes Bay in the Malmesbury division of the Colony on September 26, and again near Pinetown in Natal on September 7; in the latter case it was placed on a ledge of rock

behind a small tree about a third of the way down a krantz 60 feet in height ; it consisted of a platform of sticks nearly flat on the top, and on it were lying a few dead rats and some green twigs. It contained one young one just hatched and covered with white down, and an egg with the inmate beginning to chip out.

Eggs in the South African Museum are somewhat coarse in texture ; they are dull white in ground colour more or less blotched with yellowish or rufous-brown, and measure $2\cdot40 \times 1\cdot85$.

532. *Buteo augur*. *Augur Buzzard*.

Buteo augur, Rüpp. *N. Wirb. Vög.* p. 88, pl. 16 (1835), Sharpe, *Cat. B. M.* i, p. 175 (1874) ; *id. ed. Layard's B. S. Afr.* p. 28 (1875) ; Gurney, *Ibis*, 1876, p. 467 ; Reichenow, *Vög. Afr.* i, p. 592 (1901).

Description. *Adult male*.—Above, black ; pure white below and on the sides of the neck ; cheeks and ear-coverts black streaked with white ; quills black at the tip, ashy-grey towards the base, the secondaries paler and more silvery, all barred with black ; tail-coverts rufous with black tips, tail bright tawny with a black patch towards the tip of the outer web ; under wing-coverts white.

Iris yellowish-brown ; cere and feet yellow.

Length 20 ; wing 16·3 ; tail 7·5 ; culmen 1·55 ; tarsus 3·6. The female is larger ; wing 18·75 ; tail 9·0.

The young birds are brown above with white streaks on the nape, tail ashy-brown with a whity-brown tip crossed by twelve or thirteen bands of darker ; below, creamy-buff much marked with brown throughout, thighs ochreous-buff sometimes streaked with darker.

There is also a completely black stage with rufous tail which is considered by Sharpe to be the plumage of a very old bird, by others to be that of a young bird or a melanistic variety.

Distribution.—This Buzzard is a resident in north eastern Africa ; it has also been noticed in German east Africa and Angola. Mr. G. A. K. Marshall writes me that he has an example of this species in the black plumage obtained close to Salisbury in Mashonaland. This constitutes its only occurrence within our limits.

533. *Buteo desertorum*. *Steppe Buzzard*.

Le Rougri, *Levaill. Ois. d'Afr.* i, p. 77, pl. 17 (1799).

Falco *desertorum*, Grill, *K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 49 (1858) [Knysna] ; Gurney, *Ibis*, 1862, p. 361 ; Layard, *B. S. Afr.*

p. 8 (1867); *Gurney in Andersson's B. Damaraland*, p. 12 (1872); *Sharpe, Cat. B. M.* i, p. 179 (1874); *id. ed. Layard's B. S. Afr.* pp. 30, 797 (1875-84); *Dresser, B. Europ.* v, p. 457, pl. 332 (1875); *Gurney, Ibis*, 1876, p. 366; *Ayres, Ibis*, 1877, p. 340, 1880, p. 257, 1886, p. 284 [Potchefstroom]; *Shelley and Ayres, Ibis*, 1882, p. 238 [near Mafeking]; *Symonds, Ibis*, 1887, p. 326 [Kroonstad]; *Distant, Transvaal*, p. 56 (1892); *Fleck, Journ. Ornith.* 1894, p. 393 [Damaraland]; *Rendall, Ibis*, 1896, p. 166 [Barberton]; *Shelley, B. Afr.* i, p. 150 (1896); *Reichenow, Vög. Afr.* i, p. 594 (1901).

Description. Adult female.—General colour above, paler brown with darker shaft streaks and a good deal of white about the nape owing to most of the feathers having concealed white bases; wing feathers darker at tips, paler at the base, white banded with dark brown on the inner webs; tail shaded with rufous and with at least eleven darker transverse bands; below, dusky brown, the throat streaked, the abdomen mottled or irregularly cross-banded with white; thighs, rufous brown. There is a good deal of variation in the plumage of this bird; apparently due to a certain extent to moult, as the freshly changed bird is much darker than one just before the change.

Iris light brown; bill black; cere and gape pale yellow; legs greenish-yellow; claws black.

Length 22·0; wing 14·5; tail 8·0; tarsus 2·9; culmen 1·35.

The male is smaller; wing 13·5; tarsus 2·55.

Young birds are as a rule paler above, sometimes with lighter edges to the feathers, the tail shows no trace of rufous but is conspicuously banded, the under parts are white with a varying number of brown streaks; thighs brown, more or less mottled with paler.

Distribution.—The Steppe Buzzard is a widely spread bird; its range includes South Europe, the whole of Africa and western and southern Asia as far east as Burma. In South Africa so far as my records inform me, it is only found in summer from November to April, and is probably a migrant from the northern winter. It is found throughout the Colony, the Orange River Colony, the Transvaal, and German south-west Africa, but has not hitherto been noticed in Natal or Rhodesia.

The following are the chief recorded localities: Cape Colony—Cape division, November to February, Caledon, December, Robertson, February, near Upington on the Orange river, January (S. A. Mus.); Knysna, October (Marais), Albany division (Grahamstown Mus.), near Mafeking, January (Ayres); Orange River Colony—Near Kroonstad in summer (Symonds); Transvaal—Near Potchefstroom,

January to April (Ayres), Pretoria, December (Distant), Barberton, November (Rendall); German south - west Africa — Omaruru, December (Eriksson), Ondonga (Andersson).

Habits.—But little attention has been paid to the habits of this Buzzard in South Africa; Mr. Layard states that it frequents open country dotted with jungle, and that its voice is a weak stridulous scream. Mr. Distant found it very common, especially in the month of December, round Pretoria, where it was a great source of trouble to the small squatters on the veld. Most of these people keep poultry, and their young chickens and ducklings too often serve as food for this active and rapacious bird. Mr. Distant further noticed that these buzzards were particularly fond of sitting on the telegraph poles, and figures one thus placed. Mr. Ayres found white ants in the stomach of an individual obtained by him. It is improbable that this Buzzard breeds in South Africa.

Genus XVI. MILVUS.

Type.

Milvus, *Cuvier, Leç. Anat. Comp.* i, table 2 (1800) *M. iclinus*.

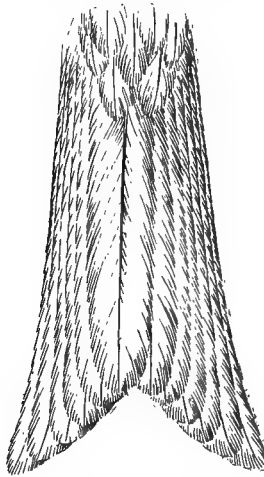


FIG. 113.—Tail of *Milvus aegyptius*. $\times \frac{1}{4}$.

Bill rather weak, hooked but without tooth; face clothed with feathers; nostrils rounded; wings long and pointed almost reach-

ing the tip of the tail, the differences between the primaries and secondaries exceeding the fork of the tail; tail strongly forked; tarsus feathered for about half its length, the bare portion covered with large transverse scutes in front and with small hexagonal ones on the sides and behind.

The kites, of which some six species are described, are spread all over the Old World from Europe to Australia. Two species are recorded from south Africa, one of them somewhat doubtfully.

Key of the Species.

- A. Bill yellow, only the feathers of the chin and throat grey with dark shafts *M. ægyptius*, p. 336.
 B. Bill black, feathers of the crown and nape as well as the chin grey with dark shafts *M. korschun*, p. 338.

534. **Milvus ægyptius.** *Yellow-billed Kite.*

Falco ægyptius et *F. forskahli*, *Gmel. Syst. Nat.* i, p. 261 (1788).

Le Parasite, *Levaill. Ois. d'Afr.* i, p. 88, pl. 22 (1799).

Falco parasitus, *Daud. Traité* ii, p. 150 (1800).

Milvus parasitus, *Burchell, Travels*, i, pp. 501, 502 (1822); *Smith, S. A.*

Quart. Journ. i, p. 390 (1830); *Gurney, Ibis*, 1859, p. 239 [Natal];

Layard, B. S. Afr. p. 25 (1867); *id. Ibis*, 1869, p. 363 [Berg river].

Milvus forskahli, *Gurney in Andersson's B. Damaraland*, p. 22 (1872).

Milvus ægyptius, *Sharpe, Cat. B. M.* i, p. 320 (1874); *id. ed. Layard's*

B. S. Afr. pp. 49, 798 (1875-82); *Gurney, Ibis*, 1879, p. 71; *Oates,*

Matabeleland, p. 298 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p.

30 (1882); *Shelley, Ibis*, 1882, p. 238 [Mashonaland]; *Butler,*

Feilden, and Reid, Zool. 1882, p. 169 [Natal]; *Ayres, Ibis*, 1886,

p. 284 [Potchefstroom]; *Fleck, Journ. Ornith.* 1894, p. 393 [Gt.

Namaqualand]; *Shelley, B. Afr.* i, p. 147 (1896); *Woodward Bros.*

Ibis, 1898, p. 221; *Sowerby, ibid.* p. 574 [Mashonaland]; *Wood*

ward Bros. Natal B. p. 149 (1899); *Marshall, Ibis*, 1900, p. 259

[Salisbury]; *Alexander, ibid.* p. 435 [Zambesi]; *Woodward Bros.*

ibid. p. 519 [St. Lucia Lake]; *Reichenow, Vög. Afr.* i, p. 609 (1901).

“*Kuiken-dief*” (*i.e.*, chicken thief) of the Colonists. “*Untloiyiya*” of Amaxosa (Stanford).

Description. *Adult.*—General colour above, sepia-brown, the head and neck thickly streaked with darker, the back and rump also with darker shaft markings; shoulders and lesser wing-coverts paler brown, other coverts and wing-quills darker, almost black; tail strongly forked, coloured like the back with indistinct traces of eight to ten darker bands and a slight paler tip; forehead, lores,

cheeks, chin, and throat grey with dark brown shaft lines, rest of the under surface sepia-brown becoming rufous-brown on the abdomen, thighs, and under tail-coverts, with dark shaft streaks throughout; tail feathers ashy below.

Iris dark brown; bill, cere and gape bright yellow; legs yellow; claws black.

Length 21·5; wing 16; tail 9·25; culmen 1·4; tarsus 2.

The female resembles the male and is of about the same dimensions.

The young bird has the feathers of the back more or less tipped with ochre; the crown rufous, shading into buff; the under surface brown broadly striped with ochre down the centre of the feathers, shading into whitish on the abdomen; bill black.



FIG. 114.—*Milvus egyptius*. $\times \frac{1}{4}$.

Distribution.—The Yellow-billed Kite is only found in South Africa during the summer months from October to March, and this seems to be the case throughout Africa. It is widely spread all over our area and though somewhat scarce in Cape Colony is common enough everywhere north of the Orange river. Beyond our limits it is spread all over Africa, Arabia, Palestine, and Asia Minor, extending in south-eastern Europe as far as Dalmatia and Greece.

The following are the chief recorded localities and dates: Cape Colony—Ceres and Caledon (Layard), Robertson, February (S. A. Mus.), Orange river, summer (Bradshaw), Kimberley (Holub), Port St. John's, November (S. A. Mus.); Natal—Common through-

out (Woodward), St. Lucia Lake in Zululand (Woodward); Transvaal — Marico and Potchefstroom (Ayres), Pretoria in summer (Distant); Rhodesia—Tati and Ramequeban rivers south of Bulawayo in September and October (Oates), Salisbury, September to March (Marshall); German south-west Africa—Reheboth, January (Fleck), Ondonga and other places from October to April (Andersson); Portuguese east Africa—Beira dist. October (S. A. Mus.), Zambesi river (Alexander).

Habits.—The Yellow-billed Kite is a bold and fearless bird of rapid and graceful flight; as stated above it is by no means common in Cape Colony but becomes more abundant further north; a pair may usually be seen, according to Marshall, patrolling the streets of Salisbury in search of something edible. It is particularly partial to young chickens, whence the Dutch vernacular name, but it will devour almost anything from lizards to fish and insects, especially locusts, which it catches on the wing and of which it is inordinately fond. Carrion soon attracts the Kite, but it is no match for the crows who usually arrive first on the scene, and has to content itself with darting down from above and taking off pieces of flesh in its talons to devour during flight. It has a loud and shrill mew-like cry.

It nests on the banks of the Berg river north of Cape Town, whence Layard received eggs; Alexander also observed it breeding in the Zambesi. The nest, a solid compact structure of sticks, is placed sometimes in a cleft in the rocky hills but more generally in a fork of a high tree. The eggs are dirty white in colour, blotched more or less with dried blood-coloured streaks and patches. They measure 2.35 × 1.70.

535. **Milvus korschun.** *Black Kite.*

Accipiter korschun, *Gmel. N. Comm. Petrop.* xv, p. 444 (1771).

Falco migrans, *Bodd. Tabl. Pl. Enl.* p. 28 (1783).

Falco ater, *Gmel. Syst. Nat.* i, p. 262 (1788).

Milvus ater, *Layard, B. S. Afr.* p. 25 (1867).

Milvus migrans, *Gurney in Andersson's B. Damaraland*, p. 21 (1872);
id. Ibis, 1879, p. 71.

Milvus korschun, *Sharpe, Cat. B. M.* i, p. 322 (1874); *id. ed. Layard's B. S. Afr.* pp. 50, 798 (1875-84).

Description.—The Black Kite closely resembles in size and plumage the Yellow-billed Kite; the adult bird can be distinguished by the fact that the feathers of the head, neck, and upper breast are greyish-white with dark brown shaft marks, whereas in

M. ægyptius the grey is confined to the chin and throat, the edges of the crown and nape feathers remaining rufous-brown. In addition to this the bill in the present species is black not yellow.

The young birds of the two species cannot be satisfactorily distinguished as the bill is black in both.

Distribution.—The Black Kite is found in central and south-eastern Asia and southern Europe, migrating in winter to Africa. It is very doubtful whether it extends its range to our area, as most of the birds obtained in South Africa appear to be really only young specimens of *Milvus ægyptius*. Mr. Gurney, who has investigated this point with much care, has only seen one undoubted South African example of *Milvus korschun*; this was obtained by Andersson at Ondonga in Ovampoland.

Genus XVII. **ELANUS.**

Type.

Elanus, *Savigny, Syst. Ois. Egypte*, pp. 9, 37 (1810) E. *cæruleus*.

Bill with rounded culmen, which is longer than half the middle toe without claws; lores with bristles which partially cover but do not conceal the nostrils; these are horizontal ovals; wings long and pointed as in *Milvus*; tail square or but very slightly forked; tarsus feathered in front nearly to the base of the toes, the bare portion being less than the middle toe without claw and covered with small polygonal scales.

This genus of Kites is spread over the whole of Africa, southern Asia, Australia, the southern portion of North and the whole of South America, and altogether about five species are recognised. Only one, here described, has been found in Africa.

536. **Elanus cæruleus.** *Black-shouldered Kite.*

Falco cæruleus, *Desf. Mém. Acad. R. des Sciences*, 1787, p. 503, pl. 15.

Le Blac, *Levaillant, Ois. d'Afr.* i, p. 147, pls. 36, 37 (1799).

Falco melanopterus, *Daud. Traité* ii, p. 152 (1800).

Elanus melanopterus, *Smith, S. Afr. Quart. Journ.* i, p. 389 (1830);

Grill, K. Vet. Akad. Handl. Stockholm, ii, no. 10, p. 49 (1858)

[*Knysna*]; *Gurney, Ibis*, 1859, p. 240 [Natal]; *Layard, B. S. Afr.* p. 26 (1867).

Elanus cæruleus, *Gurney in Andersson's B. Damaraland*, p. 20 (1872);

Sharpe, Cat. B. M. i, p. 336 (1874); *Buckley, Ibis*, 1874, p. 360 [Natal];

Sharpe, ed. Layard's B. S. Afr. pp. 52, 798 (1875-84); *Shelley, Ibis*, 1875, p. 66 [nr. Durban]; *Barratt, Ibis*, 1876, p. 196 [Rustenburg]; *Gurney, Ibis*, 1879, p. 331; *Oates, Matabeleland*, p. 298 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 31 (1882); *Butler, Feilden, and Reid, Zool.* 1882, p. 170 [Natal]; *Shelley, Ibis*, 1882, p. 239 [Mashonaland]; *Symonds, Ibis*, 1887, p. 327 [Kroonstad]; *Shelley, B. Afr.* i, p. 147 (1896); *Woodward Bros. Ibis*, 1898, p. 220 [Zululand]; *id. Natal B.* p. 150 (1899); *Alexander, Ibis*, 1900, p. 435 [Zambesi]; *Reichenow, Vög. Afr.* i, p. 614 (1901).

“Witte Sperwel” of the Dutch; “Urebe” of the Zulus (Woodward).

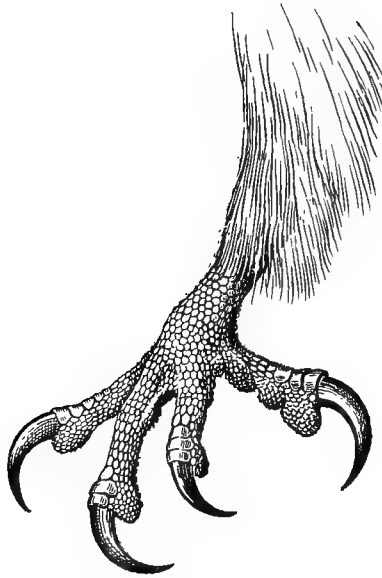


FIG. 115.—Foot of *Elanus caeruleus*. $\times \frac{9}{15}$.

Description. Adult female.—General colour above, slaty-grey, darkest in the centre of the back, palest on the crown; scapulars, lesser and median coverts black, forming a conspicuous patch on the wing, the rest of which is like the back but with darker tips to the longer primaries; central tail-feathers like the back, becoming paler towards the outermost which are quite white, especially on the inner webs; loreal bristles and a spot in front of and behind the eye black; forehead, sides of the face and the whole of the underparts and under wing-coverts white slightly suffused with blue-grey on the breast; wing-quills slaty-black below.

Iris cherry-red to bright orange; bill black; cere and gape dull yellow; legs yellow; claws black.

Length (in flesh) 12·0; wing 10·10; tail 4·75; culmen 0·90; tarsus 1·20.

The male resembles the female but is generally a little smaller, though the difference in size is not so marked as in most accipitrine birds.

The young bird is ashy-brown above, the head and neck striped with white and the feathers of the back and wings tipped with the same colour; below, the white breast and flanks are marked with brown shaft stripes. Iris light brown.

Distribution.—This Kite is found everywhere throughout Africa, including Madagascar,¹ from Algeria and Tunis to Cape Colony. It extends into south-eastern Europe and south-west Asia, reaching India and Burma.



FIG. 116.—*Elanus caeruleus*. $\times \frac{1}{10}$.

Within our limits it is fairly common everywhere. The following are some of the principal recorded localities: Cape Colony—Cape div. (Layard), Stellenbosch, Worcester (S. A. Mus), Knysna, Oudtshoorn (Victorin), Grahamstown (Stark), East London (Rickard and Wood), Port St. John's (S. A. Mus.), Orange river (Bradshaw), nr. Mafeking (Holub); Natal—Common throughout from Newcastle to Durban (Reid); Orange River Colony—Kroonstad (Symonds); Transvaal—Rustenburg (Barratt), Potchefstroom (S. A. Mus.); Mashonaland (only observed by Ayres); German south-west Africa—Omaruru

¹ Milne Edwards, *Comptes Rendus*, xci, p. 1036 (1880).



FIG. 117.—Nest of *Elanus caeruleus*, from a photograph taken by Dr. A. C. Stark near Grahamstown, on October 4th, 1897.

(Eriksson in S. A. Mus.), rare in Damaraland (Andersson); Zambesi Valley (Kirk and Alexander).

Habits.—The Black-shouldered Kite is not uncommon in the neighbourhood of Cape Town. Mr. Layard states that it is a migrant, arriving in March or April, but the data at my disposal do not altogether bear out this conclusion. It is usually seen in pairs, and is described as a bold and fearless bird often seen perched on the bare branches of high trees, where its almost white plumage makes it rather conspicuous. It is a noisy creature and has a loud and piercing cry, generally heard when on the wing. Its prey consists of rats, small birds, reptiles, and insects, and it has been known to attack and kill a caged canary, while farmers' wives say it is outrageously fond of their chickens. Mr. Layard received eggs obtained by Mr. Kotze from nests on the banks of the Berg river, and there are eggs in the South African Museum taken on the Cape Flats close to Capetown.

Dr. Stark gives the following account of a nest of this bird shown to him by Mr. Ivy:—"Grahamstown, October 2, 1897. Perched on the top of a dead tree by the side of a sluggish stream, fringed by mimosas and large oak trees in leaf, I saw a black-shouldered Kite, and shortly afterwards found its nest on the top of a mimosa about 23 feet above the ground. The nest contained five eggs, which were slightly incubated. It was quite exposed and the mimosa stood at the edge of the fringe of bush by the stream facing an open field on one side. Ivy told me that the Kites had nested in the same tree the year before. There was another nest of the same bird on the other side of the stream also with eggs. On October 4 I returned and saw both Kites perched on the same dead tree twenty yards from the harried nest. The latter I photographed and then cut off the top of the tree containing it. It was about 18 inches below the top of the tree and measured 12 inches across and 5 inches deep, the hollow being about 7 inches by $2\frac{1}{4}$ and lined with dry grass. • The nest itself was loosely constructed of flexible dried twigs."

This nest is now exhibited in the South African Museum. The ground colour of the eggs is white slightly tinged with green; this is clouded and blotched with a rich purplish-brown, sometimes but very slightly, at other times to such an extent as almost to conceal the ground colour. The measurements vary from 1.75 to 1.50 × 1.30 to 1.20.

Genus XVIII. **MACHÆRHAMPHUS.***Type.*

Machærhamphus, *Westerman, Bijd. tot de Dierkunde*,
i, p. 29. (1848) *M. alcinus.*

Bill very weak laterally, compressed anteriorly and slightly keeled; culmen about one-third the length of the middle toe without claw, gape very broad, head crested, nostrils oblique and slit-shaped, the loreal bristles reaching just above them and somewhat thickly developed; wings long, tail rounded or very slightly forked; tarsi slender, feathered only at the extreme base in front, the bare portion clothed with small scales.

Only two species of this curious genus are known, the one here described from Africa and another from the Malay Peninsula, Borneo and New Guinea. A third species doubtfully distinct from Andersson's *Pern* has recently been described from Somaliland.

537. **Machærhamphus anderssoni.** *Andersson's Pern.*

Stringonyx anderssoni, *Gurney, Proc. Zool. Soc.* 1865, p. 618.
Machærhamphus alcinus (*nec Westerm.*), *Bartlett, Proc. Zool. Soc.*, 1866, p. 324; *Gurney, Trans. Zool. Soc.* vi, p. 117, pl. 29 (1869).
Machærhamphus anderssoni, *Sharpe, Proc. Zool. Soc.* 1871, p. 501; *Gurney in Andersson's B. Damaraland*, p. 23 (1872); *Sharpe, Cat. B. M.* i. p. 343 (1874); *Gurney, Ibis*, 1879, p. 464; *Sharpe, ed. Layard's B. S. Afr.* p. 798 (1884); *Shelley, B. Afr.* i, p. 147 (1896); *Reichenow, Vög. Afr.* i, p. 596 (1901).

Description.—Blackish-brown above, with grey mottling, the bases of the nape feathers white; chin and throat white with a blackish-brown central streak; upper breast variegated black and brown; breast brown; abdomen and under tail-coverts (which are very long) white, the latter tipped with dark brown; tail-feathers dark brown with narrow white tips and narrow transverse bands of paler brown on the inner webs, of white on the lower side; wing-quills brown with white bands on the lower side.

Iris lemon-yellow; bill bluish-lead with black tip; feet bluish-white.

Length 17·70; wing 13·75; tail 7·25; tarsus 2·2.

The female is slightly larger, length 18·2; wing 13·9; tail 7·5.

A young bird is blackish-brown throughout, the throat and abdomen mottled with white; tail-feathers with obscure paler brown cross bands; wing-quills without cross bands.

Distribution.—This remarkable bird was first obtained by Mr.

Andersson on March 10th, 1865, at Otjimbinque in Damaraland; the type, a female, is now preserved in the Norwich Museum. Another, a male, also obtained by Andersson, is in the British Museum, and a third shot by Eriksson at Omaruru also in Damaraland is at Stockholm. The bird though apparently rare is more widely spread



FIG. 118.—*Machærhamphus anderssoni*. $\times \frac{1}{4}$.

than it was at first supposed, as it has been recorded from Loango in French Congo, from Somaliland, from the coast of British East Africa and from Madagascar.

There are also two examples in the Durban Museum shot near that town, one in 1892 the other on July 1st, 1897.

Habits.—Andersson states that he believes this bird to be nocturnal in its habits. He found bats in the stomach of the two examples examined by him.

Genus XIX. **PERNIS.**

Type.

Pernis, *Cuvier, Règne An. i, p. 322 (1817)*..... *P. apivorus*.

Bill somewhat weak and compressed with no trace of the festoon and with but a slight hook; nostrils linear and oblique with a membranous upper margin; lores and portion of the face in front of the eye covered with small well-developed scale-like feathers not with bristles; head crested; wings long and pointed; tail rounded; tarsus with the upper third feathered in front and the lower bare portion covered with small round or hexagonal scales.

The Honey Buzzards are found all over the Old World including Madagascar, but not in Australia or its attendant islands. Out of some five species described, one only visits Africa in winter.

538. ***Pernis apivorus***. *Honey Buzzard*.

Falco apivorus, *Linn. Syst. Nat.* i, p. 130 (1766).

Le Tachard, *Levaillant, Ois. d'Afr.* i, p. 82, pl. 19 (1799).

Pernis apivorus, *Gurney, Ibis*, 1859, p. 240, 1860, p. 204 [Natal]; *Layard, B. S. Afr.* p. 24 (1867); *Sharpe, Cat. B. M.* i, p. 345 (1874); *id. cd. Layard's B. S. Afr.* p. 53 (1875); *Dresser, B. Eur.* vi, p. 3, pls. 364-6 (1875); *Gurney, Ibis*, 1880, pp. 195, 203; *Shelley, B. Afr.* i, p. 147 (1896); *Marshall, Ibis*, 1900, p. 270; *Reichenow, Vög. Afr.* i, p. 613 (1901).

Description.—Not quite adult female (Rustenburg, Transvaal). General colour above, sepia-brown, most of the feathers with paler edges and darker shaft stripes. Head brown somewhat mottled with white owing to the basal halves of the feathers being that colour; wing-quills dark brown; upper tail-coverts lighter brown

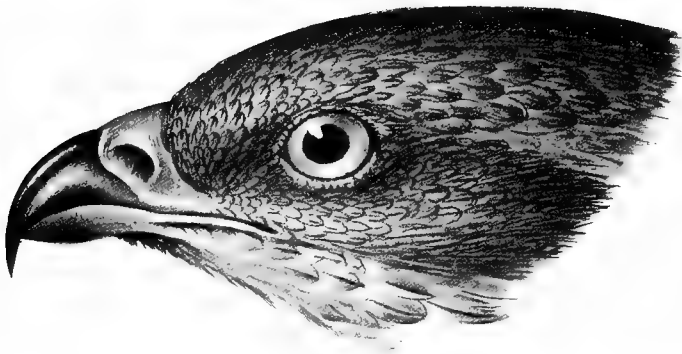


FIG. 119.—*Pernis apivorus*. $\times \frac{9}{10}$.

than the back; tail brown crossed by three bars of darker, one basal, one median, and one terminal; between the two latter indications of five or six other less distinct bars; below, including the under wing-coverts, brown with white mottlings; wing-quills and tail nearly white below, with a distinct median cross bar and tip on the former.

Iris bright yellow; bill and cere black, yellowish at the gape; feet yellow; claws black.

Length 23·5; wing 16·25; tail 10·50; culmen 1·3; tarsus 2·05.

This species undergoes a series of somewhat puzzling changes of plumage, but can always be recognised by the little rounded scale-like feathers on the side of the face in front of the eye. The head of the adult male is ashy-grey, while in the female the grey is usually limited to the lores.

Distribution.—The Honey Buzzard breeds throughout the greater part of Europe and north-western Asia, perhaps extending to China and Japan. During October and again in May it crosses the straits of Gibraltar in large numbers and spends the winter in west Africa; a few reach South Africa and Madagascar. In South Africa it is one of our rarest migrants; Levaillant obtained a specimen in Namaqualand which he described under the name of the "Tachard." Ayres got two in Natal, and one at Rustenburg in the Transvaal on December 27th, 1882, the latter being now preserved in the South African Museum. Recently Mr. Marshall has related how he found a specimen lying dead on the veld near Salisbury. There is also an example shot near Durban preserved in the Museum there. These are the only South African records so far as I am aware.

Habits.—No observations to speak of have been made on the habits of the Honey Buzzard in South Africa, except that in the stomachs of the individuals examined by Ayres and Marshall wasps and crickets in the one case, locusts and a chameleon in the other, were found.

In Europe the nest, usually placed on the remains of the former abode of some other large bird, and often on the main fork of an oak or beech, is well lined and sometimes sheltered with fresh twigs and leaves of the latter. The round and glossy eggs, generally two in number, are laid in June, and are creamy-white blotched and often suffused with rich brown or red. Both male and female incubate.

Genus XX. ACCIPITER.

Type.

Accipiter, *Bris. Orn.* i, p. 310 (1760) *A. nisus*.

Bill small but strong, edge of the upper mandible slightly festooned; nostrils oval without a central bony tubercle; wings comparatively short, extending about half way along the tail;

tarsus long and slender, scaled as in *Astur*; middle toe very long without claw easily exceeding twice the ridge of the culmen without cere.

This genus is cosmopolitan, containing according to Sharpe forty-two species; ten of them are African and four South African.¹



FIG. 120.—Beak and middle toe of *Accipiter rufiventris*. $\times \frac{1}{2}$.

Key of the Species.

- A. Small, wing under 6·5; upper tail-coverts white; tail feathers with white spots on the inner webs *A. minullus*, p. 348.
- B. Size moderate, wing from 8·0 to 10·0.
- a. Upper tail-coverts like the back; under parts chestnut-rufous *A. rufiventris*, p. 350.
- b. Upper tail-coverts white spotted; underparts white transversely banded with grey *A. ovampensis*, p. 352.
- C. Size large, wing 11·0 to 13·0; black above, black or black and white below *A. melanoleucus*, p. 353.

539. **Accipiter minullus.** *Little Sparrow Hawk.*

Le Minule, *Levaillant, Ois. d'Afr.* i, p. 140, pl. 34 (juv.) (1799).

Falco minullus, *Daud. Traité*, ii, p. 88 (1800).

Accipiter minullus, *Smith, S. A. Quart. Journ.* i, p. 226 (1830); *Gurney, Ibis*, 1859, p. 242 [Natal]; *Layard, B. S. Afr.* p. 29 (1867); *Gurney, Ibis*, 1868, p. 144; *id. in Andersson's B. Damaraland*, p. 31 (1872); *Sharpe, Cat. B. M.* i, p. 140 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 23, 796 (1875-84); *Shelley, Ibis*, 1875, p. 65 [near Durban]; *Gurney, Ibis*, 1875, p. 473; *Ayres, Ibis*, 1879, p. 387 [Rustenburg]; 1886, p. 283 [Limpopo river]; *W. Ayres, Ibis*, 1887, p. 47 [Zoutspansberg]; *Shelley, B. Afr.* i, p. 152 (1896); *Sharpe, Ibis*, 1897, p. 495 [Zululand]; *Woodward Bros. Ibis*, 1898, p. 219, *id. Natal B.* p. 142 (1899); *Alexander, Ibis*, 1900, p. 437 [Zambesi]; *Reichenow, Vög. Afr.* i, p. 561 (1901).

¹ An old mounted Sparrow Hawk in the South African Museum, stated to have been procured at Swellendam by Mr. W. Atmore, appears to be referable to the European *Accipiter nisus*.

Description. *Adult male.*—Above, dark slaty-black, the feathers of the nape and scapulars with concealed white bases; wing-quills brown barred with darker brown on the inner webs, the interspaces becoming white on the basal halves of the feathers; upper tail-coverts white, tail-feathers dark brown with two or three large white spots on the inner webs, and slightly tipped with the same colour, the outer pair with alternate bands of white and brown; ear-coverts brown, chin and throat white, slightly spotted with brown; rest of the under surface white crossed by narrow bars of brown edged with rufous, bars strongest on the breast; sides of the breast and flanks strongly suffused with rufous; under wing-coverts pale fulvous spotted with brown.

Iris orange; bill black; cere yellow; legs orange; claws black.

Length 9·5; wing 5·55; tail 4·20; tarsus 1·60; culmen 0·65.

The female resembles the male but is considerably larger; length 12·5; wing 6·40; tarsus 1·70.

Young birds are brown rather than slaty above, and have the edges of many of the feathers rufous; below, the bars are replaced by large drop-like spots of dark brown on the breast, becoming more band-like on the abdomen, thighs, and under tail-coverts; sides of the breast and flanks strongly tinged with rusty rufous.

Iris bright yellow; bill black; cere yellow; tarsi and feet yellow with a greenish tinge in front.

Distribution.—The little Sparrow Hawk is generally distributed over the more wooded parts of South Africa, including the southern and eastern districts of Cape Colony, Natal, the Transvaal and the Zambesi valley; it has not as yet been noticed in southern Rhodesia though it will probably be found there, nor is it found in Great Namaqualand or Damaraland strictly speaking. North of our limits it extends to Angola, Nyasaland and German and British east Africa as far north as Witu, while in west Africa it is replaced by a closely allied species.

The following are the chief South African localities: Cape Colony—George, Albany and Pondoland (S. A. Mus.), Knysna (Victorin and Marais), Stockenstroom (Atmore), East London (Wood), Port St. John's (S. A. Mus); Natal—Near Durban (Shelley), Umgoye and Echowe in Zululand (Woodward); Transvaal—Zoutspansberg (W. Ayres), Rustenburg (T. Ayres); Bechuanaland—Near Lake Ngami (Andersson); German south-west Africa—The Okavango river (Andersson); Chicowa on the Zambesi (Alexander).

Habits.—Notwithstanding its diminutive size this little Hawk is

as bold and fearless as others endowed with twice its strength ; it is a bush-loving bird and a very swift flyer. It will twist and turn with great dexterity among the branches of trees when in pursuit of its prey. It will attack fowls and young ducks, pouncing down with an oblique swoop, and not from above as is the case with other hawks.

A nest, found by Mr. Eriksson's collector on October 13th on the Limpopo river, was placed in a mimosa tree and was built of sticks. It contained three eggs of a chalky-white ground colour much blotched and clouded with brown and dull greyish-purple.

The Woodward's kept one of these birds in captivity, but it never lost its savage nature and would not allow any other birds to be confined with it.

540. **Accipiter rufiventris.** *African Sparrow Hawk.*

Accipiter rufiventris, *Smith, S. Afr. Quart. Journ.* i, p. 231 (1830); *id. Ill. Zool. S. Afr. Aves*, pl. 93 (1844); *Layard, B. S. Afr.* p. 29 (1867); *Gurney in Andersson's B. Damaraaland*, p. 32 (1872); *Sharpe, Cat. B. M.* i, p. 148 (1874); *id. ed. Layard's B. S. Afr.* pp. 22, 796 (1875-84); *Gurney, Ibis*, 1875, p. 478; *Ayres, Ibis*, 1876, p. 422 [Lydenburg]; *Butler, Feilden, and Reid, Zool.* 1882, p. 169 [Newcastle]; *Shelley, B. Afr.* i, p. 153 (1896); *Woodward Bros. Natal B.* p. 143 (1899); *Reichenow, Vög. Afr.* i, p. 560 (1901).

Falco exilis, *Temm. Pl. Col.* i, pl. 496 (juv.) (May, 1830).

Nisus rufiventris, *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 48 (1858) [Knysna].

Accipiter exilis, *Gurney, Ibis*, 1859, p. 243; 1860, p. 204 [Natal].

"Unhloile" of Natal Zulus [Woodward].

Description. *Adult male.*—Above, dark slate coloured with concealed white bases to the feathers of the nape and scapulars; wing-quills brown, banded with darker brown on the inner web with interspaces becoming white towards the bases of the feathers; tail tipped with white and crossed by four darker bands; in the paler inner spaces the shafts of the feathers show a tendency to whiteness; chin, throat, and under tail-coverts white, rest of the under surface including the thighs and the under wing-coverts chestnut.

Iris yellow; bill black; cere greenish-yellow; legs lemon-yellow, claws black.

Length 13·0; wing 8·25; tail 6·0; culmen 0·70; tarsus 2·0.

The female is very much larger and the rufous of the lower

surface a good deal darker. Length 16.0; wing 9.25; tail 7.20; tarsus 2.3.

A young bird is dark brown above, most of the feathers edged with a narrow band of rufous; the white tip to the tail is much less marked; below, the feathers of the chin and chest have dark brown shaft stripes; the breast, abdomen and flanks show strong traces of brown transverse cross bars, covered over and obliterated by the gradually spreading rufous colouring of the adult.

Distribution.—The African Sparrow Hawk is not uncommon in the neighbourhood of Cape Town, whence it extends over the greater part of the Colony and Natal. From the Transvaal it has only been recorded from near Lydenburg by Ayres; in Damaraland and Great Namaqualand it is stated by Andersson to have rarely come under his notice. Its range in South Africa is, therefore, somewhat



FIG. 121.—*Accipiter rufiventris*. $\times \frac{1}{4}$.

limited. Beyond our region it is not known from Angola, Nyasaland, or east Africa, but has been obtained in Abyssinia by Harris, Rüppell, and Heuglin, and from the interior of Togoland in west Africa by Büttner.

South African localities are: Cape Colony—Cape div. and Swellendam (S. A. Mus.), Knysna (Victorin and Marais), Baviaans river valley in Bedford (Smith), Albany not uncommon (Grahams-town Mus.); Natal—Near Howick (S. A. Mus.), and Newcastle (Butler); Transvaal—Lydenburg (Ayres).

Habits.—Little has been recorded regarding the habits of this hawk; Layard states that it sometimes hovers like a kestrel when on the look-out for mice or other ground-animals, at other times he has seen it glance like lightning through a copse and in passing whip off a small bird perched on a branch. It also feeds on white

ants and beetles and is very destructive to the farmer's chickens; the nest is built of sticks and is placed in a thick fir tree on a horizontal forked branch.

Two eggs in the South African Museum, found at Mulders Vlei near Stellenbosch, are bluish-white covered with yellowish-brown stains, probably of blood. They measure 1.70×1.45 .

541. **Accipiter ovampensis.** *Ovampo Sparrow Hawk.*

Accipiter ovampensis, Gurney, *Ibis*, 1875, p. 367, pl. 7; Sharpe, ed. *Layard's B. S. Afr.* p. 796 (1884); Shelley, *B. Afr.* i, p. 132 (1896); Marshall, *Ibis*, 1900, p. 256 [Mazoe]; Reichenow, *Vög. Afr.* i, p. 560 (1901).

Description. *Adult male.*—Upper surface dark ashy-grey paler on the sides of the neck; feathers of the nape with white bases and upper tail-coverts with a pure white spot about the middle of each feather; primaries greyish-brown barred with darker brown, below the notch the paler intervals are white on the inner web and on the lower surface they are white throughout, the secondaries have less distinct markings; tail transversely marked, four dark bars alternating with four paler bars, the tips white, a white spot in the centre of the paler bars includes a portion of the shaft, which is also white; the under tail-coverts and tail below are white, the latter traversed by five dark bars; the rest of the under surface is white with narrow transverse bars of grey, narrowest on the throat.

Length 13.5; wing 9.2; tail 6.5; tarsus 1.7; culmen without cere 0.55.

An immature female is dark brown above, the feathers of the head and neck broadly margined with white; some of the feathers of the inner secondaries and back tinged with rufous; tail with five darker bands above, six below; on the paler interspaces only the shafts of the feathers are white; below, throat and under tail-coverts white; upper breast with brown shaft marks, rest of the under parts transversely barred, but the bars wider apart than in the adult and slightly sagitate; under wing-coverts white transversely barred with brown at narrow intervals.

Length 15.5; wing 10.4; tail 7.6; tarsus 2.1; culmen without cere 0.6.

This bird, the description of which has been compiled from Gurney's original account, bears in its markings a remarkable resemblance to *Astur polyzonoides*, from which it differs in the absence

of the rufous tinge to the transverse bands of the under-parts and in the markings on the under wing-coverts. It can also be invariably distinguished by its long middle toe measuring 1·4 in the male and 1·7 in the female as against 1·0 in *Astur polyzonoides*.

Distribution.—This species was first obtained by Andersson in Ovampoland (at Elephant's Vlei and on the Okavango river); thence it extends to the Upper Zambesi (Bradshaw) to Mashonaland (Marshall) and to the Nyasa-Tanganyika plateau in Nyasaland.

Habits.—Mr. G. A. K. Marshall tells me that he found this species breeding on the Umfuli river in October, 1895; he sent the female and two eggs to the late Dr. Bendelack Hewetson of Leeds.

542. **Accipiter melanoleucus.** *Black Sparrow Hawk.*

Accipiter melanoleucus, *Smith, S. A. Quart. Journ.* i, p. 229 (1830); *Sharpe, Cat. B. M.* i, p. 156 (1874); *id. ed. Layard's B. S. Afr.* p. 25 (1875); *Gurney, Ibis*, 1875, p. 473; *Shelley, B. Afr.* i, p. 153 (1896); *Reichenow, Vög. Afr.* i, p. 556 (1901).

Astur melanoleucus, *Smith, Illustr. Zool. S. Afr. Aves*, pl. 18 (1839); *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 49 (1858) [Knysna]; *Gurney, Ibis*, 1859, p. 241, 1861, p. 135, 1862, p. 155, 1864, p. 357 [Natal]; *Layard, B. S. Afr.* p. 27 (1867).

Description. Adult male.—Above, black with concealed white bases to the nape feathers and scapulars; wing-quills browner with white spots on the inner webs below the notch; tail with obscure traces of three to four darker bands; below, black throughout except for the under surface of the wing- and tail-quills which are banded black and white; nearly all the feathers of the lower surface have concealed white bases.

Iris orange; bill black; cere and legs yellow-green.

Length 19·5, in flesh 19·0; wing 11 to 12; tail 9·0; culmen 1·25; tarsus 2·8.

The female is larger; length 23; wing 12·7; tarsus 3·3. Before reaching the black adult stage the black and white stage is passed through in which the lower side of the body is white except for the sides of the breast, flanks, and thighs, which are black slightly variegated with white.

A young bird is brown above, the head and neck strongly striped with rufous; most of the feathers of the back have rufous edges, and the paler bands of the wing-quills and tail are tinged with rufous; entire lower surface chestnut, the sides of the head and neck and the

breast marked with brown stripes most conspicuous on the breast; the throat with a single median stripe, otherwise unspotted.

Iris dusky brown; bill black; cere yellowish-green; feet pale yellow.

The entirely black phase is comparatively rare, most apparently adult specimens of this species having more or less white on the under surface.

Distribution.—The Black Sparrow Hawk is rare and has a restricted distribution in South Africa having been found hitherto only in the southern half of the Colony and in Natal. Beyond our limits it is recorded from Nyasaland, German east Africa, north-east and west Africa, but appears to be nowhere common.

According to Ayres this Hawk is common in the summer months in Natal and is probably therefore a migrant.

The following are localities: Cape Colony—Cape and Bedford divisions (Smith), George, Beaufort West and Albany (Layard), Knysna (Victorin and Marais); Natal—Maritzburg (Ayres).

Habits.—These birds are only found in wooded districts and appear to be everywhere rare. They are very bold in hunting their prey; they pursue pigeons and attack poultry; they are often so intent upon the chase that neither shouting or guns will deter them, though naturally exceedingly shy. Mr. Ayres on one occasion lost three hens, five chickens, seven ducklings, and a gosling within a short space of time before he was able to secure the marauder. Mr. Atmore states that he once found a nest built in a large tree which contained three young birds and an egg just about to be hatched.

Genus XXI. **ASTUR.**

Type.

Astur, *Lacep. Mem. de l'Inst.* iii, p. 505 (1801) ... *A. palumbarius*.

Bill rather small but strong, margin of the upper mandible with a very distinct festoon; nostrils oval without any trace of the bony tubercle present in *Melierax*; wings rather short hardly reaching the middle of the tail; tarsus long, stout, and scutellate in front and behind, reticulate on the sides and below at the distal end; middle toe comparatively short, without claw equal to or less than twice the length of the culmen without cere.

This genus is widely spread over the greater part of the world except South America; two only out of the ten African species are found within our limits.

Key of the Species.

- A.* Rather larger, wing above 7·5.
a. Centre tail-feathers with a dash of white
 on the pale bars of the inner web,
 underparts narrowly barred *A. tachiro, ad.* p. 356.

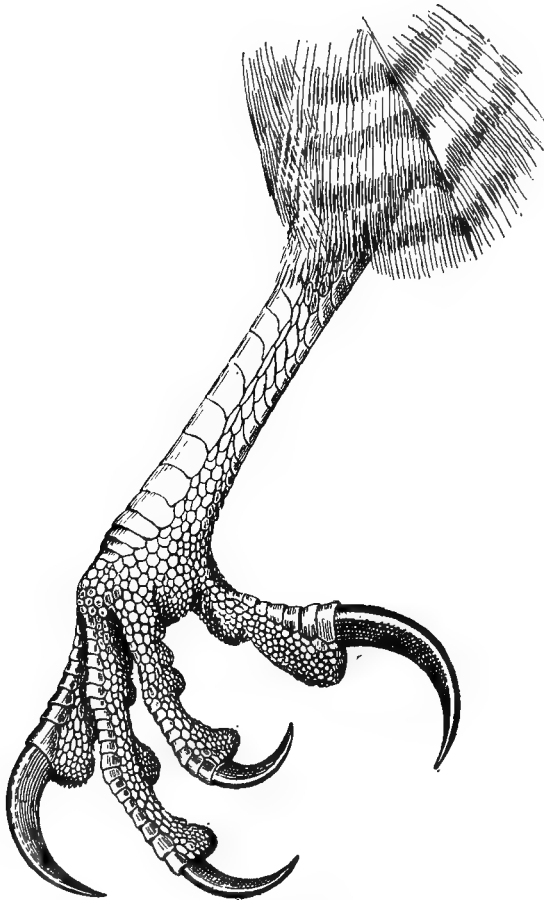


FIG. 122.—Foot of *Astur tachiro*. $\times \frac{1}{2}$.

- b.* Centre tail-feathers barred but without
 white dash, under surface with dark
 brown drop spots *A. tachiro, juv.* p. 356.

- B. Rather smaller, wing usually less than 7·5.
 c. Centre tail-feathers plain grey unbarred ;
 underparts narrowly barred *A. polyzonoides*, *ad.* p. 358.
 d. Centre tail-feathers barred, without
 white spots, under surface with pale
 rufous drop spots *A. polyzonoides*, *juv.* p. 358.

543. **Astur tachiro.** *African Goshawk.*

Le Tachiro, *Levaillant, Ois. d'Afr.* i, p. 100, pl. 24 (juv.) (1799).

Falco tachiro, *Daud. Traité*, ii, p. 90 (1800) ; *Temm. Pl. Col.* i, pls. 377, 420 (1827).

Micronisus tachiro, *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 48 (1858) [Knysna].

Accipiter tachiro, *Gurney, Ibis*, 1859, p. 241, 1860, p. 204, 1862, p. 155, 1868, p. 144 [Natal] ; *Layard, B. S. Afr.* p. 28 (1867) ; *Gurney in Andersson's B. Damaraland*, p. 29 (1872).

Astur tachiro, *Sharpe, Cat. B.M.* i, p. 99 (1874) ; *id. ed. Layard's B.S. Afr.* p. 20 (1875) ; *Gurney, Ibis*, 1875, p. 361 ; *Rendall, Ibis*, 1896, p. 16 [Barberton] ; *Shelley, B. Afr.* i, p. 166 (1896) ; *Woodward Bros. Ibis*, 1898, p. 219 [Zululand] ; *id. Natal B.* p. 142 (1899) ; *Reichenow Vög. Afr.* i, p. 552 (1901).

Description. *Adult male.*—General colour above, dark slate, lighter on the head inclining to brown on the wings ; nape feathers white at the base, sometimes showing through ; primaries and secondaries barred lighter and darker brown on the inner webs, the latter becoming white towards the base of the feathers ; tail-feathers slightly tipped with white and crossed by three darker bands, both markings becoming obliterated towards the outer pair of feathers ; on the two centre feathers there is a dash of white following the dark band on the inner web, cheeks and sides of the neck pale slaty-grey ; chin, throat, and underparts, including the under wing-coverts, white, narrowly cross-banded with brown, the bars most distinct on the chest ; flanks and thighs strongly tinged with rufous.

Iris light yellow ; bill black ; cere and legs yellow.

Length (in flesh) 15·0 ; wing 7·75 ; tail 6·5 ; culmen 1·0 ; tarsus 2·40.

The female resembles the male but is rather larger ; wing 9·75 ; tarsus 2·70.

A young male is dark brown above, the feathers narrowly edged with rufous, those of the head and neck with white bases, giving those parts a mottled appearance ; tail feathers with four darker

bars tipped with buffy-white, cheeks and sides of the neck streaked with brown and white; below, white tinged with pale buff to a greater or less extent, throat with a central brown streak and traces of moustachial streaks of the same colour. Most of the feathers with drop-like spots of dark brown; these are largest on the breast.

Iris greenish-brown; bill black, blue at the base; cere dusky; legs and feet yellow.

Distribution.—The African Goshawk is apparently restricted to the more wooded districts of South Africa; it is found along the south coast of the Colony, in Natal, Zululand, and the low-lying



FIG. 123.—*Astur tachiro*. $\times \frac{11}{12}$.

eastern portion of the Transvaal; it is stated to be very rare in Damaraland by Andersson. Beyond our limits it is found in southern Angola, Nyasaland, and German east Africa, beyond which it is replaced in west and north-east Africa by other though closely-allied species.

The following are localities: Cape Colony—Knysna (Levaillant and Victorin), Swellendam, George, Albany, Peddie and Pondoland (S. A. Mus.), Bathurst and Alexandria district (Grahamstown Mus.), Port St. John's (S.A. Mus.); Natal—Ifafa river (Woodward), Escourt (Stark), Umgoye, in Zululand (Woodward); Transvaal—Barberton (Rendall); Damaraland (Andersson); Shupanga on the Zambesi (Kirk).

Habits.—This bird is essentially a forest-haunting species; it lives in the bush near wooded streams, and darts on small birds from the trees above; it is a bold poultry thief, and the Woodwards have seen one carry off a full-grown fowl from close to where they

stood. It makes excursions high into the air, uttering a peculiar piercing squeak, which can be heard a great distance off.

A nest was found by Mr. Graham Hutchinson and Dr. Stark near the summit of the Bushman Pass between Escourt in Natal and Basutoland on November 4th; it was placed about 40 feet up in the bushy top of a rather slender tree; it was large and deeper than that of an English Sparrow Hawk and was built of large dead sticks, lined with green twigs with leaves still attached, torn from the tree on which the nest was built. Two fresh eggs, pure creamy-white, were taken on this occasion.

544. *Astur polyzonoides*. *Little Banded Goshawk*.

Accipiter polyzonoides, *Smith, Ill. Zool. S. Afr. Aves*, pl. 11 (1838); *Layard, B. S. Afr.* p. 29 (1867); *Gurney, Ibis*, 1868, p. 144; *Ayres, Ibis*, 1869, p. 288 [Transvaal]; *Gurney in Andersson's B. Damara-land*, p. 38 (1872).

Astur polyzonoides, *Sharpe, Cat. B. M.* i, p. 133 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 22, 796 (1875-84); *Gurney, Ibis*, 1875, p. 360; *Barratt, Ibis*, 1876, p. 195; *Ayres, Ibis*, 1877, p. 340; *Oates, Matabeleland*, p. 298 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 35 (1882); *Shelley and Ayres, Ibis*, 1882, p. 237 [Mashonaland]; *Ayres, Ibis*, 1884, p. 219; *W. Ayres, Ibis*, 1887, p. 417 [Zoutspansberg]; *Fleck, Journ. Ornith.* 1894, p. 393 [Gt. Namaqualand]; *Shelley, B. Afr.* i, p. 152 (1896); *Woodward Bros. Natal B.* p. 142 (1899); *Marshall, Ibis*, 1900, p. 256 [Mashonaland]; *Alexander, Ibis*, 1900, p. 437 [Zambesi]; *Reichenow, Vög. Afr.* i, p. 556 (1901).

Description. Adult male.—Above, blue-grey with concealed white bases to the feathers of the nape and scapulars; primary quills dark slate coloured, both they and the secondaries barred with white on the basal half of the inner webs; two centre tail-feathers unbarred, outer ones with about six darker cross bars, the interspaces becoming whiter and the bars more conspicuous towards the outer feathers; cheeks and the sides of the neck and throat paler than the back; rest of the under surface white, the breast, upper abdomen, thighs and under wing-coverts traversed by five cross bars of pale brown, the under tail-coverts plain.

Iris crimson to orange, eyelids yellow; bill dark slate with a black tip; cere light orange yellow; tarsi and feet orange, claws black. The colours of these parts vary considerably in different individuals.

Length 11·25; wing 7·0; tail 5·25; culmen 0·70; tarsus 1·75.

The female is very similar in plumage and only slightly larger; length 12·0; wing 7·0.

The young bird is darker above, a slaty-brown, the feathers edged with rufous; all the tail-feathers are distinctly banded with about six dark cross bars; cheeks and sides of the neck brown striped with white; chin and throat white with a central brown streak; rest of the under surface white with oval drop-shaped spots of pale rufous, becoming more bar-like on the flanks, thighs, and abdomen; the under tail-coverts plain.

Iris yellow; bill bluish-black; cere and legs yellow.

Distribution.—The Little Banded Goshawk was first discovered by Sir A. Smith “north of 26° s. lat.,” *i.e.*, in about the neighbourhood of Mafeking; it has been since obtained to the south of this on the Orange river near Upington by Bradshaw, but is not known from Cape Colony south of that river. In Natal it is rare, but has been obtained by Graham Hutchinson and the Woodwards. All over the Transvaal and Rhodesia it is comparatively abundant, and in the Transvaal, Damaraland, and Namaqualand it is partially migratory. North of the Zambesi it extends to South Angola, Nyasaland, and German east Africa, and is replaced in the rest of Africa and also in India by closely-allied species.

Habits.—In Damaraland this bird is stated by Andersson to be migratory, arriving at the beginning of the rains and leaving on the approach of the dry season. The females arrive first, the males a few days later, but the bulk of the birds seen are young ones in first plumage. In the Transvaal, on the other hand, it is stated by Ayres to be more abundant in the winter in the dry season. This Goshawk is partial to well-wooded districts, where it seeks shelter among the foliage and is never seen perching in conspicuous situations. Mice, lizards, small birds, and insects form its diet. Mr. Marshall gives the following account of it: “This little Hawk is one of our commonest birds of prey, and also one of the few which reside here all the year round. It is by no means shy, sitting fairly close within the foliage of the trees; when disturbed it descends with a low swooping flight, dodging in the bush, but for no great distance, and rising abruptly to its perch. The nest is a neat structure of sticks placed in the fork of a tree, about 15 to 20 feet from the ground; the eggs, which are three or four in number, are dull white, with highly variable blotches of vandyke-brown and underlying markings of lilac-grey, and measure 38 × 30 mm. (*i.e.*, 1·50 × 1·20 inches). Stomachs contained lizards, snakes, locusts, and winged termites.”

Genus XXII. **MELIERAX.***Type.***Melierax**, *Gray, List Gen. B. i, p. 5 (1840)* *M. canorus*.

Bill moderate, the edge of the upper mandible slightly festooned, sides of the face feathered; nostrils exposed, rounded, well within the cere and provided with a bony tubercle; wings long and



FIG. 124.—Foot of *Melierax canorus*. $\times \frac{1}{4}$.

pointed; tail square or slightly graduated; tibia and tarsus almost equal in length; tarsus covered with well-marked transverse plates in front and behind, with smaller scales between; middle toe of moderate length, without claw almost equal to or less than twice the ridge of the culmen.

This is a purely African genus containing seven species, four of which are found in South Africa.

Key of the Species.

- A. Larger, wing over 10·0.
 a. Upper tail-coverts pure white..... *M. canorus*, p. 361.
 b. Upper tail-coverts white, closely barred with
 slaty-grey *M. meehowi*, p. 363.
 B. Smaller, wing under 8·0.

- a. Upper tail-coverts white, contrasting with slaty-grey back *M. gabar*, p. 364.
 b. Upper tail-coverts black like the rest of the plumage above and below *M. niger*, p. 366.

545. **Melierax canorus.** *Chanting Goshawk.*

Le Faucon chanteur, *Levaill. Ois. d'Afr.* i, p. 117, pl. 27 (1801).

Falco canorus, *Rislach in Thunb. Diss. Ac.* iii, p. 264 (1799).

Falco musicus, *Daud. Traité* ii, p. 116 (1800); *Burchell, Travels*, i, p. 394 (1822) [Junction of Orange and Vaal rivers].

Melierax musicus, *Grill, K. Vet. Akad. Handl.* ii, no. 10, p. 49 (1858) [Oudtshoorn]; *Layard, B. S. Afr.* p. 31 (1867); *Gurney, Ibis*, 1868, p. 145; *Layard, Ibis*, 1869, p. 71; *Ayres, Ibis*, 1869, p. 289 [Limpopo]; *Gurney in Andersson's B. Damaraland*, p. 26 (1872); *Ayres, Ibis*, 1877, p. 340 [Potchefstroom]; *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 32 (1882); *Bryden, Kloof and Karroo*, p. 152 [Willowmore] (1889.)

Melierax canorus, *Sharpe, Cat. B. M.* i, p. 87 (1874); *Buckley, Ibis*, 1874, p. 359; *Sharpe, ed. Layard's B. S. Afr.* pp. 17, 795 (1875-84); *Gurney, Ibis*, 1875, p. 235; *Oates, Matabeleland*, p. 298 (1882); *Fleck, Journ. Ornith.* 1894, p. 392 [Gt. Namaqualand]; *Shelley, B. Afr.* i, p. 151 (1896); *Woodward Bros. Natal B.* p. 141 (1899); *Reichenow, Vög. Afr.* i, p. 542 (1901).

"Blaauw Valk" of the Dutch colonists.

Description. Adult male.—Above, slaty-grey, darkest on the crown of the head, the primary quills, the inner secondaries and round the eye; most of the coverts paler grey; inner secondaries white, vermiculated and spotted with grey forming a band along the wing; upper tail-coverts white; tail-feathers like the back, all but the two centre ones tipped with white, and with increasing patches of white on the inner webs so that the outer pair are almost wholly white; below, chin and upper breast pale slaty-grey, rest of the under surface, including the thighs and under tail-coverts, white with narrow transverse bars of slaty-grey; under wing-coverts white slightly mottled with grey.

Iris deep reddish-brown; bill bluish-black; cere and base of bill orange or bright brick-red; legs red; claws black.

Length (in the flesh) 20·0; wing 13·5; tail 8·5; culmen 1·5; tarsus 4·35.

The young bird is brown above with traces of paler edges and tips to some of the feathers, the primaries white at the base, paler on their inner edges and barred with black; the upper tail-coverts white with V-shaped marks of brown; tail dark brown barred with

paler brown or slaty with an increasing amount of white on the outer webs; chin white, chest brown, mottled with darker brown centres to the feathers; more rufous on the belly and thigh, streaked and spotted with white throughout, under wing-coverts white marked with rufous.

Iris yellowish-green; beak black; cere yellow; legs orange.

Distribution.—The Chanting Goshawk is essentially an inhabitant of the western and dryer half of South Africa. It is spread over the western and central districts of the Colony as far as the Fish River Rand in the Albany division, and thence northwards over Bechuanaland, the western Transvaal, and German south-west Africa; it has only once, so far as I am aware, been obtained in Natal and must be very rare in the eastern half of South Africa. Beyond our limits this bird has recently been obtained in Nyasaland in the Lugenda river valley.



FIG. 125.—*Melierax canorus*. $\times \frac{1}{2}$.

The following are recorded localities: Cape Colony—Worcester, Robertson (S. A. Mus.), Beaufort West (Layard), Oudtshoorn (Victorin), Willowmore (Atmore and Bryden), Fish river Rand in Albany division (Grahamstown Museum), Orange river near Upington (Bradshaw), near Aliwal North (Whitehead), Griqualand West (S. A. Mus.); Natal—Richmond (Fitzsimmons and Woodward); Transvaal—Potchefstroom and Limpopo river (Ayres); Bechuanaland (Bradshaw and Holub); German south-west Africa—Great Namaqualand and Damaraland (Andersson and Fleck).

Habits.—This bird has been surrounded by Levaillant with a somewhat fictitious glamour. He tells us that the male sings most sweetly all day and night perched on a branch near the female. On this account he gave it the name of “Chanteur.” Later observers have not noticed this great gift of song, but state that it gives a mellow piping whistle from time to time somewhat resembling the thrilling notes of musical glasses.

The Chanting Goshawk frequents open or bushy country where it lives a good deal on the ground, running swiftly in pursuit of its prey but rising and settling on a tree when disturbed; its food consists of rats, mice, reptiles and insects. Even such large animals as hares and paauwes (*Otidæ*) fall victims to it on occasion.

The nest is built in the fork of a tree or bush and, according to Atmore, four eggs are laid. These are nearly true ovals and white, measuring from 2·30 to 2·10 × 1·76 to 1·70.

546. **Melierax mechowi.** *Mechow's Goshawk.*

Melierax polyzonus (*nec Rüpp.*), *Gurney in Andersson's B. Damaraland* p. 88 (1872); *Sharpe, Cat. B. M. i.*, p. 88 (1874) (in part); *id. ed. Layard's B. S. Afr.* pp. 18, 795 (1875-84); *Marshall, Ibis*, 1900, p. 256 [Mashonaland].

Melierax mechowi, *Cabanis, Journ. Ornith.* 1882, p. 229; *Shelley, B. Afr.* i, p. 151 (1896); *Sowerby, Ibis*, 1898, p. 573; *Reichenow, Vög. Afr. i.*, p. 546 (1901).

Description. *Adult.*—General colour above, dark slate, the primaries darker, almost black, the secondaries lighter, a bluish-slate, some of the latter slightly mottled with white at the tip; upper tail-coverts dark slate with narrow transverse bands of white; tail-feathers black, all but the centre pair tipped with white, and towards the outer pair increasingly barred and mottled with white; below, throat and chest like the back, rest of the under surface, including the thighs, under wing- and tail-coverts finely banded with dark slate and white.

Iris brown; bill horn-black, vermilion at the base; cere and feet vermilion.

Length 18·0; wing 12·0; tail 7·75; tarsus 3·5; culmen 1·30.

The female is somewhat larger; wing about 13·4.

The young bird is brown above, mottled and streaked with paler, tail brown, banded with blackish-brown with increasing white on the inner web; throat white streaked with pale rufous, chest clouded

and mottled with pale rufous, rest of under surface whitish with bars of pale rufous, wings and tail white below barred with black or brown.

Distribution.—The type of this species was obtained in Angola, whence it is also recorded by Bocage under the name of *M. polyzonus*; it appears to replace the previously described species in northern Damaraland and Mashonaland. Andersson obtained a single individual at Elephant's Vlei on November 10th, 1859, and Eriksson one at Ovaquenyama in Ovampoland on November 20th, 1890; the latter specimen is in the South African Museum. It has been recently noticed in Mashonaland by Sowerby and Marshall, where, however, it is not common.

Beyond our limits it is found in the more inland portions of German east Africa according to Reichenow.

547. **Melierax gabar.** *Gabar Goshawk.*

Le Gabar, *Levaill. Ois. d'Afr.* i, p. 136, pl. 33 (1799).

Falco gabar, *Daud. Traité*, ii, p. 87 (1800).

Accipiter gabar, *Smith, S. A. Quart. Journ.* i, p. 225 (1830).

Micronisus gabar, *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 48 (1858) [Oudtshoorn]; *Reichenow, Vög. Afr.* i, p. 565 (1901).

Melierax gabar, *Layard, B. S. Afr.* p. 30 (1867); *Gurney, Ibis*, 1868, p. 145; *Ayres, Ibis*, 1869, p. 288 [Transvaal]; *Gurney in Andersson's B. Damaraland*, p. 28 (1872); *Sharpe, Cat. B. M.* i, p. 89 (1874); *Buckley, Ibis*, 1874, p. 359; *Sharpe, ed. Layard's B. S. Afr.* pp. 19, 795 (1875); *Gurney, Ibis*, 1875, p. 235; *Barratt, Ibis*, 1876, p. 195; *Oates, Matabeleland*, p. 298 (1881); *Holub & Pelzeln, Orn. Süd-Afr.* p. 34 (1882); *Ayres, Ibis*, 1886, p. 283 [Limpopo river]; *Symonds, Ibis*, 1887, p. 327 [Kroonstad]; *Fleck, Journ. Ornith.* 1894, p. 392 [Gt. Namaqualand]; *Shelley, B. Afr.* i, p. 151 (1896); *Sharpe, Ibis*, 1897, p. 495 [Zululand]; *Sowerby, Ibis*, 1898, p. 573 [Mashonaland]; *Woodward Bros. Natal B.* p. 141 (1899); *Alexander, Ibis*, 1900, p. 437 [Zambesi Valley].

“Klein sperwel” of Dutch.

Description. *Adult male.*—Above, slaty-grey; primary quills dark brown, cross-barred with lighter brown on the inner web and white towards the base; secondaries like the back, the outer ones tipped with white and cross-banded on the inner webs like the primaries; rump blackish; upper tail-coverts white; tail-feathers brownish-black all tipped with white and with two or three cross bands of grey, which become white on the outer feathers; throat and chest grey, lower breast, under wing-coverts, abdomen, and

thighs white, cross-banded with brown, the bars narrower on the lower flanks and thighs; under tail-coverts white; quills and tail-feathers strongly banded dark brown and white.

Iris crimson; bill black; cere and legs reddish-orange.

Length 12·5; wing 7·0; tail 5·75; tarsus 1·75; culmen 0·80.

The female is larger; length 14·0; wing 7·75; tarsus 1·85.

A young male is brown above with traces of white bases and paler edgings to the feathers; tail banded paler and darker brown, the lighter brown spaces becoming white towards the outer feathers; cheeks and ear-coverts pale rufous streaked with brown, throat and chest whitish with streaks of rufous and dark brown down the centre of the feathers; rest of the lower surface banded with narrow lines of pale rufous. Iris, cere, base of bill and feet yellow.

The young female is larger than the male, has more rufous on the sides of the neck and chest, and much broader bars of the same colour on the abdomen and thighs.

Distribution.—A widely-spread bird found throughout Africa from Egypt to Cape Colony except in the west coast forest-region.

In South Africa the Gabar is found everywhere except perhaps in Natal, though apparently most abundant on the west. The following are the principal localities: Cape Colony—Cape div. (S. A. Mus.), Oudtshoorn (Victorin), Middelburg (S. A. Mus.), Albany and Graaff Reinet (Grahamstown Museum), Orange river near Upington (S. A. Mus.); Orange River Colony—Modder river (Barratt), Kroonstad (Symonds); Zululand (Woodward); Transvaal—Komati Poort (Francis in S. A. Mus.), Pretoria, Potchefstroom, and Marico (Barratt); Bechuanaland (Exton); Mashonaland (Sowerby); German south-west Africa—Great Namaqualand and Damaraland (Andersson); Zambesi valley (Alexander).

Habits.—The Gabar is a somewhat shyer bird than the Chanting Goshawk, and is generally found along the wooded banks of rivers and in kloofs where it is able to couceal itself amongst the thick foliage. It is not as a rule seen perched on a conspicuous branch. It is stated by Atmore to be a more melodious whistler than the Chanting Goshawk. Mice, small birds, lizards, and insects form its prey, and Ayres has seen it entering the nests of the Black Weaver bird (*Textor*) doubtless in quest of young birds. Nests have been found by Atmore in the Willowmore division of the Colony and by the Woodwards on the Ivuna river in Zululand; they are built of sticks and lined with wool, and usually placed in the fork of a mimosa. The eggs, generally three in number, are dull white slightly stained, and measure about 1·65 × 1·30.

548. *Melierax niger*. *Black Gabar*.

Sparvius niger, *Bonn. et Vieill. Enc. Meth.* iii, p. 1269 (1823).

Melierax niger, *Layard, B. S. Afr.* p. 31 (1867); *Gurney in Andersson's B. Damaraland*, p. 29 (1872); *Sharpe, Cat. B. M.* i, p. 91 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 20, 796 (1875-84); *Ayres, Ibis*, 1878, p. 282 [Transvaal]; *Fleck, Journ. Ornith.* 1894, p. 393; *Shelley, B. Afr.* i, p. 151 (1896).

Melierax gabar var. *nigra*, *Holub & Pelzeln, Orn. Süd-Afr.* p. 34 (1882).
Micronisus niger, *Reichenow, Vög. Afr.* i, p. 567 (1901).

Description. *Adult male.*—General colour black; quills brown, the inner webs of both primaries and secondaries barred with dark and light brown, the latter becoming white towards the base of the feathers; tail crossed by four dirty white bars; below, black throughout, the quills and tail-feathers barred black and white more distinctly below than above.

Iris red; bill black; base, cere, and feet cinnamon-red.

Length 12·25; wing 7·25; tail 5·80; culmen 0·80; tarsus 1·85.

The female resembles the male in plumage but is a little larger; wing 8·0; tarsus 2·1.

Distribution.—This bird has been considered by some ornithologists to be merely a melanism of the previous species *M. gabar*, which it closely resembles in size, shape, and distribution. It is spread over north-eastern and eastern Africa, from Abyssinia and Kordofan southwards.

In South Africa it is exceedingly rare and has been obtained in the following localities only: Cape Colony—Albany div. rare (Grahamstown Mus.); Bechuanaland—Kalahari (Fleck), Lake Ngami district (Andersson); Transvaal—Potchefstroom (Ayres), Rustenburg (Lucas), Marico and Bloemhof (Holub); German south-west Africa—Omaruru and elsewhere in Damaraland (Eriksson and Andersson).

Genus XXIII. **CIRCUS**.

Type.

Circus, *Lacép. Mem. de l'Inst.* iii, p. 506 (1806)..... *C. cyaneus*.

Bill moderate, margin of the upper mandible slightly festooned but not toothed; sides of the face feathered, the bristles of the lores partially concealing the nostrils, which are large, oval, situated in the anterior part of the cere, and not provided with a bony tubercle; wings long and pointed; tail long, even at the tip or slightly

rounded; tibia and tarsus practically equal in length; tarsus feathered at the base only, covered in front with transverse shields, behind with polygonal ones and with smaller scales on either side; a marked difference as a rule in the plumage of the sexes.

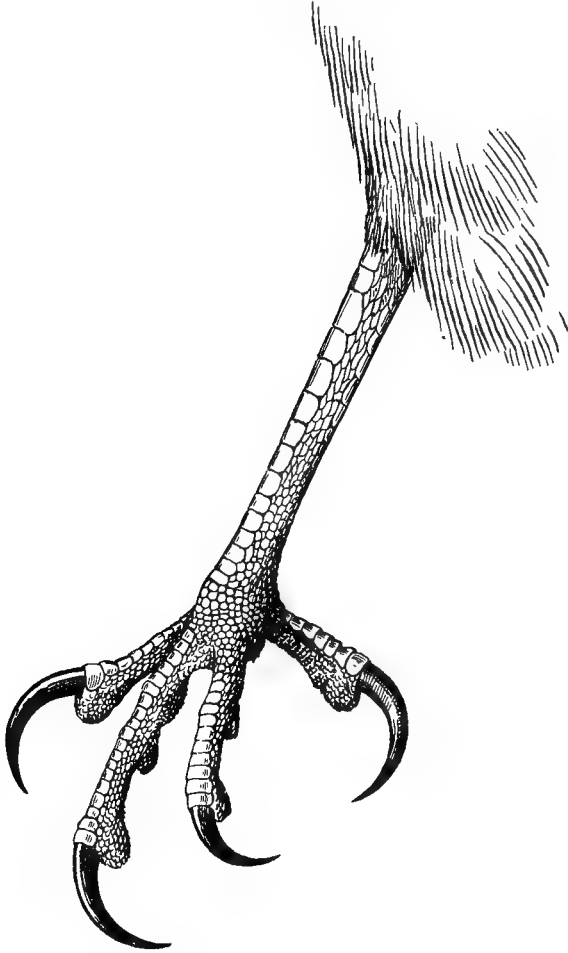


FIG. 126.—Foot of *Circus ranivorus*. $\times \frac{9}{10}$.

The Harriers are generally distributed throughout the temperate and tropical regions of the Old and New World; nine species are known from Africa and five of these reach South Africa, two being residents and three migrants from the northern hemisphere.

There is preserved in the South African Museum an example of *Circus maillardi* labelled as having been procured from Kuruman in Bechuanaland; this species is considered to be confined to Madagascar and the neighbouring islands; should no mistake have occurred in the labelling, the species must be included in the South African fauna.

Key of the Species.

- A. The fifth primary plain, not emarginated.
- a.* The second primary emarginated about an inch beyond the primary coverts; smaller tarsus under 2.5 *C. cineraceus*, p. 368.
- b.* The second primary emarginated at the level of the tips of the primary-coverts; larger tarsus over 2.5 *C. macrurus*, p. 370.
- B. The fifth primary emarginated like the others.
- a.* General colour including the thighs black. *C. maurus*, p. 372.
- b.* General colour brown, the thighs rufous ...
- a*¹. Tail banded *C. ranivorus*, p. 374.
- b*¹. Tail uniform grey..... *C. aeruginosus*, p. 374.
- c*¹. Tail uniform dark brown..... *C. ranivorus et C. aeruginosus, juv.* p. 374.

549. *Circus cineraceus.* *Montagu's Harrier.*

- Falco cineraceus*, *Montagu, Orn. Dict.* i, p. K. 2 (1802).
- Circus cineraceus*, *Layard, B. S. Afr.* p. 34 (1867).
- Circus cinerarius*, *Gurney in Andersson's B. Damaraland*, p. 33 (1872).
- Circus pygargus (nec Linn.) Sharpe, Cat. B. M.* i, p. 64 (1874); *id. ed. Layard's B. S. Afr.* pp. 12, 795 (1875-84); *Gurney, Ibis*, 1875, p. 222; *Barratt, Ibis*, 1876, p. 195 [Lydenburg dist.]; *Shelley, Ibis*, 1882, p. 237 [Harts river]; *Butler, Feilden, and Reid, Zoologist*, 1882, p. 168; *Rendall, Ibis*, 1896, p. 116 [Barberton]; *Shelley, B. Afr.* i, p. 153 (1896); *Reichenow, Vög. Afr.* i, p. 534 (1901).
- Circus cineraceus*, *Ayres, Ibis*, 1877, p. 339, 1878, p. 283, 1880, p. 259 [Potchefstroom]; *Symonds, Ibis*, 1887, p. 325 [Kroonstad]; *Marshall, Ibis*, 1900, p. 255 [Mashonaland].

Description. *Adult male.*—Above, bluish-grey, the wing-coverts a little darker; primary coverts silver-grey, outer primaries black throughout, inner ones slightly washed with grey at the tips and along the inner webs, secondaries with a black bar most conspicuous below; tail-feathers like the back, all but the two centre ones with, or with traces only, of five dark bars; below, a paler bluish-grey, abdomen, flanks, thighs, and under tail-coverts white faintly streaked

with pale rufous, axillaries and under wing-coverts white also streaked with pale rufous.

Iris clear yellow; bill black; cere greenish-yellow; feet yellow.

Length 18·5; wing 14·5; tail 8·0; culmen 0·95; tarsus 2·25.

The female is very dark brown above with fulvous edgings to some of the feathers, the head and neck including the facial ruff streaked with pale rufous; quills dark brown, the primaries shaded with gray externally; upper tail-coverts white; tail brown, tipped with paler brown, crossed by three bands of lighter brown or sometimes ashy; on the outer feathers these lighter bands tend to become white, especially on the inner web; below, rufous or buffy white with darker centres to the feathers especially on the breast.

Iris hazel; bill black; cere dull yellow; feet yellow. Length 19·0; wing 15·3; tail 8·7. Very old females perhaps become grey plumaged like the males.

A young male in the South African Museum is like the female but more uniform; the central tail-feathers are nearly uniform, the others transversely banded with pale rufous; the primaries below are dirty white transversely barred with black; the lower surface clear tawny with a few central streaks of darker.

In all states of plumage the fifth primary is not emarginated along its outer web and the emargination of the second is about an inch beyond the primary coverts.

Distribution.—The breeding range of Montagu's Harrier extends over central and southern Europe, western Asia as far as Turkestan and northern Africa; occasionally it nests even in England, where formerly it was much more abundant. During the northern winter it migrates southwards to India, Palestine, Abyssinia, and South Africa; hitherto it does not appear to have been noticed in the countries intervening, though doubtless it occurs there.

It is nowhere very common in South Africa, though widely spread from the Cape division of the Colony to Mashonaland. Its occurrence in Natal is doubtful; Captain Reid believed that he saw one on the wing between Colenso and Ladysmith on November 20.

The following are recorded localities: Cape Colony—Cape, Swellendam and Bathurst divisions (Layard); Orange River Colony—Kroonstad in summer (Symonds); Transvaal—Potchefstroom, March (Ayres), Barberton, January (Rendall), Lydenburg (Barratt); Bechuanaland—Harts river, February (Ayres); German south-west Africa—Otjimbingue and Ondonga (Andersson), Omaruru, December

(Eriksson S. A. Mus.) ; Rhodesia—Near Salisbury in summer (Marshall).

Habits.—Montagu's Harrier is generally seen in open grass country, over which it ranges with a low skimming flight in search of its food ; it is specially fond of burnt patches of ground and also, according to Marshall, of country near swamps and streams where termites' nests occur which shelter mice of various kinds.

In addition to mice, small birds, and the eggs of those which lay on the ground, small reptiles and large insects form a great part of their diet.

As this bird is only a migrant from the northern winter it is unlikely that it will ever be found breeding here. In Europe the nest is a mere hollow lined with dry grass and placed on the ground ; four to five bluish-white eggs, sometimes plain, sometimes spotted, are laid at the end of May, and the male bird is said to take no part in the duties of incubation.

550. *Circus macrurus.* *Pale Harrier.*

Accipiter macrourus, *S. G. Gmel. N. Comm. Petrop.* xv, p. 439, pls. vii and ix (1771).

Circus swainsoni, *Smith, S. Afr. Quart. Journ.* i, no. 4, p. 384 (1830) ; *id. Illustr. Zool. S. Afr. Aves*, pls. 43, 44 (1840) ; *Layard, B. S. Afr.* p. 34 (1867) ; *Ayres, Ibis*, 1871, p. 148 [Potchefstroom] ; *Gurney in Andersson's B. Damaraland*, p. 32 (1872).

Circus superciliaris, *Smith, S. Afr. Quart. Journ.* i, no. 4, p. 385 (1830).

Circus macrurus, *Sharpe, Cat. B. M.* i, p. 67 (1874) ; *id. ed. Layard's B. S. Afr.* pp. 11, 795 (1875-84) ; *Shelley, Ibis*, 1875, p. 65 [Ceres] ; *Ayres, Ibis*, 1878, p. 283 ; 1880, p. 258 ; 1884, p. 218 ; *Symonds, Ibis*, 1887, p. 325 [Kroonstad] ; *Shelley, B. Afr.* i, p. 153 (1896) ; *Woodward Bros Natal B.* p. 139 (1899) ; *Marshall, Ibis*, 1900, p. 255 [Mashonaland] ; *Alexander, Ibis*, 1900, p. 438 [Zambesi] ; *Reichenow, Vög. Afr.* i, p. 534 (1901).

Description. Adult male.—Above, pale slaty-grey, the crown rather darker, lores, eyebrow, and sides of the face white, the ear-coverts slightly streaked with ashy ; quills blackish-brown edged ashy-grey ; upper tail-coverts white subterminally spotted with ashy ; middle tail feathers uniform ashy-grey, the others white with four or five grey bars and tipped with white ; below, white tinged with grey on the throat and upper breast ; wing and tail feathers below nearly white with only traces of spots and bars.

Iris pale yellow; bill black; cere greenish; legs yellow.

Length 17·5; wing 13·75; tail 8·5; culmen 1·15; tarsus 2·60.

Adult female.—Above, brown, the feathers of the head, hind neck, and lesser wing-coverts edged with pale rufous; frontal feathers, eyebrow, and spot below the eye white, moustachial streaks and ear-coverts dark brown; quills brown, externally edged with ashy, and barred with white on the inner web, especially below; upper tail-coverts white with a few brown spots, middle tail feathers ashy-brown, outer one pale rufous to white, all barred across with three to five dark brown cross bands; lower surface creamy white with broad longitudinal streaks of brown which become narrower and more rufescent on the abdomen and thighs.

Iris dusky hazel; bill bluish black; cere and legs yellow; claws black.

Length (in flesh) 19·0; wing 14·25; tarsus 2·70.

The young bird resembles the female but is not so variegated, but there is a white nuchal patch and the ruff is unstreaked buff and strongly marked; the under surface is entirely pale fawn colour. In all stages of plumage the fifth primary is not emarginated and the notch on the second is on a level with the tips of the coverts.

Distribution.—This Harrier, like Montagu's, is only a seasonal visitor to South Africa; its breeding range extends over southern and eastern Europe and Central Asia, while from September to April it is found throughout the greater part of Africa and India, including Ceylon and Burma.

Within our limits it seems to be generally distributed, though nowhere common, and the following are the principal recorded localities: Cape Colony—Cape division, December, Beaufort West division and Caledon (S. A. Mus.), Grahamstown (Atherstone), East London (Rickards and Wood), Oleyvenhout drift near Upington, January and February (Bradshaw); Uplands of Natal (Woodward); Orange River Colony—Kroonstad in summer (Symonds); Transvaal—Potchefstroom, November to March (Ayres); Mashonaland (Marshall); German south-west Africa, Gt. Namaqualand, Damara-land and Ondonga in Ovampoland, January (Andersson); Chicowa, October and Zumbo, November, on the Zambesi (Alexander).

Habits.—The Pale Harrier resembles other harriers in its habits; it is usually to be seen flying low near the ground rather leisurely and with a somewhat wavering flight, in search of small rodents, birds, or even grasshoppers and locusts, which form the

greater part of its food; near farms it will often snatch up the unwary chicken, but it is usually seen in open country or near rivers and marshes. During the heat of the day it occasionally retreats to a thick tree for shelter, and both Ayres and Alexander have flushed individuals from such a position.

The Woodwards state that Mr. Graham Hutchinson found a nest of this Harrier in a wattle plantation in the upper part of Natal; this is possibly a mistake, as like Montagu's Harrier this bird is only known in South Africa as a migrant from the breeding grounds of the northern hemisphere.

551. **Circus maurus.** *Black Harrier.*

Falco maurus, *Temm. Pl. Col.* i, pl. 461 (1828).

Circusalandii, *Smith, S. A. Quart. Journ.* i, p. 388 (1830).

Circus maurus, *Smith, Ill. Zool. S. Afr. Aves*, pl. 58, juv. (1840); *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 48 (1858) [Knysna]; *Layard, B. S. Afr.* p. 35 (1867); *Gurney in Andersson's B. Damaraland*, p. 33 (1872) [Little Namaqualand]; *Sharpe, Cat. B. M.* i, p. 60 (1874); *id. ed. Layard's B. S. Afr.* p. 13 (1875); *Shelley, B. Afr.* i, p. 153 (1896); *Woodward Bros. Natal B.* p. 139 (1899); *Reichenow, Vög. Afr.* i, p. 539 (1901).

"Wit-kruis Valk" of the Dutch.

Description. *Adult male.*—General colour black; on the nape of the neck the feathers with white bases which sometimes show, forming a nape spot; primaries black edged silvery-grey on the outer web and white at the back of the inner; primary-coverts ashy-grey; rump like the back, upper tail-coverts white; tail black with three broad bars of ashy-grey and white edging to the tip; base of feathers white; towards the outer feathers the ashy is replaced by white; below, black with a browner tinge than the back, a few small white spots on the lower breast and under tail-coverts and white frecklings on the thighs; tail below, banded with white instead of ashy.

Iris yellow; bill black; cere and legs yellow; claws black.

Length about 20·0; wing 13·25; tail 9·35; tarsus 3·0; culmen 1·20.

The female resembles the male but is larger; length about 22·25; wing 14·25; tarsus 3·25.

A young bird is deep chocolate-brown with rufous-buff margins to the feathers; the white on the nape shows through; eyebrow and sides of the face buffy-white; below, deep ochreous-buff variegated with white on chin, lower chest, thighs, abdomen, and lower tail-coverts.

The fifth primary is notched on the outer web in all stages of plumage.

Distribution.—The Black Harrier has a very restricted distribution, being almost entirely confined to the Colony; it does not appear to have been noticed in the Transvaal or even north of the Orange river,* and in Natal has only been seen by Mr. Graham Hutchinson, who states that it is a yearly visitor to the flats below the Drakensberg.

The following are localities: Cape Colony—Cape div., Stellenbosch, Tulbagh (S. A. Mus.), Berg river (Layard), Little Namaqualand (Andersson), Knysna (Victorin), Grahamstown (Layard), Port Elizabeth and East London (Rickard).

Habits.—The Black Harrier is not uncommon on the Cape Flats near Cape Town and is often to be observed among the marshes at the mouth of the Salt river; it haunts the banks of rivers and swamps and is generally seen in pairs leisurely sailing along just above the ground searching for mice, rats, frogs, lizards, and young birds, which form its prey.

“After a few heavy flaps of its wings,” says Layard, “it sails along with its primaries elevated swaying to and fro like a clock pendulum; suddenly it checks itself, lets fall a leg, clutches up a cowering lark or unsuspecting jerboa and flits away with it to the nearest termites heap, on which it perches and commences its repast. If accompanied by its mate, a shrill stridulous cry soon brings it to its side and the dainty morsel is shared between them.”

The Black Harrier breeds in September on the Berg river; the nest is placed close to the ground among the reeds in the marshes and is composed of dry reeds and twigs lined with wool and hair; three to four eggs are laid, these are bluish-white, sometimes plain sometimes slightly irregularly blotched with dark brown; they measure 1.80×1.50 ; Layard noticed that the second lot of eggs laid after the removal of the first were always somewhat whiter and less spotted.

* I have recently examined an example preserved in the Bloemfontein Museum obtained near that town in July, 1880, by Mr. Geo. Chalfield.

552. **Circus æruginosus.** *Marsh Harrier.*

Falco æruginosus, *Linn. Syst. Nat. 12th. ed. i*, p. 130 (1766).

Circus æruginosus, *Ayres, Ibis*, 1871, p. 147 [Potchefstroom]; *Sharpe, Cat. B. M. i*, p. 69 (1874); *id. ed. Layard's B. S. Afr.* p. 16 (1875); *Dresser, B. Eur.* v, p. 415, pls. 326, 327 (1878); *Shelley, B. Afr. i*, p. 153 (1896); *Reichenow, Vög. Afr. i*, p. 539 (1901).

Description. Adult male.—Head creamy-white streaked with umber-brown, facial ruff indistinct, mantle brown; primaries blackish, rest of the wings and tail silvery-grey; upper tail-coverts white washed with grey and tinged with rufous; below, buff striped with brown on the breast and with chestnut on the belly and thighs, under wing-coverts and axillaries uniform and buffy-white.

Iris bright yellow; bill blackish; cere greenish-yellow; claws black.

Length 22·5; wing 16·0; tail 10·0; tarsus 3·4; culmen 1·55.

The female has the tail and under parts brown and is slightly larger, length 23·0; wing 17·0; tail 11·0.

Young birds are chocolate-brown throughout, but in the males the entire crown of the head is buffish-white while the females have a yellowish patch streaked with brown on the nape only.

Distribution.—The Marsh Harrier is found throughout the greater part of Europe, north Africa and the temperate portions of Asia, as far as Turkestan and Kashmir. Though partially resident, some of the birds migrate southwards during the northern winter to India, Ceylon, and the eastern half of Africa from Abyssinia, where it is fairly common in the winter months, to German east Africa, Angola, and the Transvaal.

In South Africa it must be either very rare or have been mistaken for the South African Marsh Harrier, as it has only been once recorded by Ayres, who states that he shot a single specimen (an immature male in white-headed plumage now in the Norwich Museum) in December, 1869, while it was hunting in a marsh. Mr. G. A. K. Marshall, however, informs me that he has recently obtained an example in white-headed plumage which was shot in the neighbourhood of Salisbury, in Mashonaland.

553. **Circus ranivorus.** *South African Harrier.*

Le Grenouillard, *Levaillant, Ois. d'Afr. i*, p. 95, pl. 23 (1799).

Falco ranivorus, *Daud. Traité ii*, p. 170 (1800).

Circus levaillantii, *Smith, S. Afr. Quart. Journ. i*, p. 387 (1830).

Circus ranivorus, *Smith, S. Afr. Quart. Journ. i*, p. 386 (1830); *Grill, K*

Vet. Akad. Handl. Stockh. ii, no. 10, p. 48 (1858) [Cape div.]; *Gurney, Ibis*, 1859, p. 242, 1860, p. 204 [Natal]; *Layard, B. S. Afr.* p. 85 (1867); *Gurney, Ibis*, 1868, p. 464 [Transvaal]; *id. ed. Andersson's B. Damaraland*, p. 34 (1872); *Sharpe, Cat. B. M.* i, p. 71 (1874); *Buckley, Ibis*, 1874, p. 359 [Natal]; *Sharpe, ed. Layard's B. S. Afr.* pp. 14, 795 (1875-84); *Shelley, Ibis*, 1875, p. 65 [Durban]; *Gurney, Ibis*, 1875, p. 223; *Ayres, Ibis*, 1878, p. 283 [Potchefstroom]; *Oates, Matabeleland*, p. 297 [Pretoria]; *Holub & Pelzeln, Orn. Süd-Afrikas*, p. 38 (1882) [Bechuanaland]; *Butler, Feilden, and Reid, Zool.* 1882, p. 38 [Newcastle]; *Shelley, B. Afr.* i, p. 153 (1896); *Woodward Bros. Natal B.* p. 140 (1899); *Reichenow, Vög. Afr. i.*, p. 540 (1901).
 "Kikvorsch-vanger" (*i.e.*, Frog-catcher) of the Dutch.

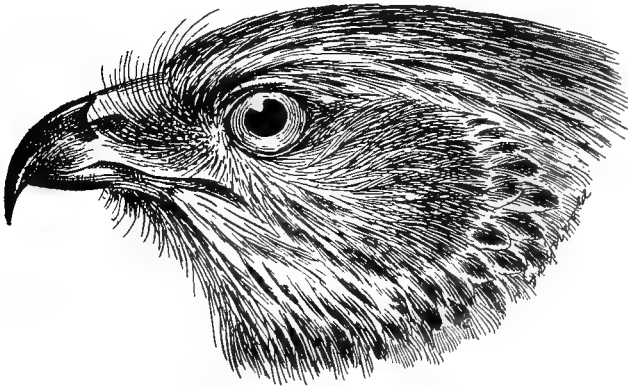


FIG. 127.—*Circus ranivorus*. $\times \frac{1}{2}$.

Description.—Above, dark brown; the feathers of the nape, facial ruff, shoulders and wing-coverts edged and tipped with white; primaries nearly black, but marbled with white on the basal half of the inner web; primary coverts and secondaries barred across with ashy-grey and slightly tipped with white; upper tail-coverts rufous with a few whitish spots and tips; tail ashy tipped with white, with indications, more or less distinct, of six or seven dark sepia cross bands; below, breast dark brown, many of the feathers edged with white, especially on the lower breast, becoming dark rufous on the abdomen and under tail-coverts; tail-feathers hardly showing any trace of bars below.

Iris yellow; bill black; cere greenish-yellow; feet light yellow; claws black.

Length in flesh 19·75; wing 15·0; tail 9·4; tarsus 3·20; culmen 1·35.

The female is very similar to the male, but rather more streaked on the abdomen and thighs, which are not so rufous.

Iris tawny yellow; wing 15·60; tarsus 3·45.

A young bird in the South African Museum is very dark brown variegated with pale rufous and white on the back of the neck and upper back; the forehead and a ring round the eye are dirty white, and the ear-coverts dark brown; below, the throat and the middle of the breast are white, the rest of the under-surface dark brown inclining to rufous on the thighs and lower abdomen; the tail is uniform dark brown, or black above and ashy-brown below, slightly tipped with rufous-brown.

Iris dusky brown (Ayres).

In all stages of plumage the fifth primary is emarginated.

Distribution.—This is doubtless the commonest of the South African Harriers throughout the Colony, Natal, the southern Transvaal and Bechuanaland, but it appears to become rarer north of the Limpopo, at least it has not hitherto been noticed in German south-west Africa or Rhodesia. North of the Zambesi it is recorded by Anchieta from southern Angola, by Kirk from the Shiré river, and by Reichenow from German east Africa, but in each case only single specimens appear to have been procured.

The following are the more important localities: Cape Colony—Cape div., Caledon, George (S. A. Museum), Beaufort West (Layard), Aliwal North (Wood), Port Elizabeth and East London (Rickard); Natal—Durban (Shelley), Maritzburg (Buckley), and Newcastle (Butler); Transvaal—Near Pretoria (Oates), Potchefstroom (Holub); Lake Ngami country (Chapman *apud* Layard).

Habits.—This Harrier is a resident throughout the year in South Africa. Like its congeners it is usually seen in marshy spots or along rivers, though occasionally it may be met with in open, dry, upland country. It hunts over one spot, keeping close to the ground with a laboured and heavy flight, though remaining on the wing for many hours at a time and only alighting to take and devour its prey; this consists of frogs, rats, and aquatic birds, such as young or wounded snipe, of which it appears to be specially fond.

The nest is built in September or October in the reeds at the edge of a marsh or river, and three to four chalky-white eggs with a bluish tinge, measuring about 2·0 × 1·5, are laid.



FIG. 128.—Nest with eggs of *Circus ranivorus*, from a photograph taken by Capt. Moore, A.P.D., on Sept. 25, 1900, on the Cape Flats.



FIG. 129.—The same nest three weeks later, with two young birds hatched out. Also from a photograph by Capt. Moore.

Dr. Stark in his notes gives the following account of it: "On October 1, at Weston in Natal, I found a nest of this Harrier with three eggs in a vlei of about 20 acres near the Mooi river, and shot



FIG. 130. —Another nest of *Circus ranivorus*, with half-fledged young one and the parent bird descending with a rat in her claws. Also from a photograph by Capt. Moore, taken on the Cape Flats in October, 1901.

the hen bird. The nest was a large one measuring about 20 inches across at the surface of the water, and was in the form of a flattened cone, the top being nine inches above the water, which

was there knee deep; the whole was surrounded by growing rushes about a foot high.

“The nest was built of the large and long dried stems of reeds, straws, and dry grass, and the hollow about 6 inches across and 2 inches deep was lined with finer dry grass. On removing the lining I found two more eggs underneath, one fresh one and one slightly incubated. These two eggs had evidently been laid some time before when the water was not nearly so high, probably before the rains. The nest having been flooded by the rise in the water the birds must have added to it by burying the two eggs already laid and then have deposited three more eggs. While I was examining the nest the male bird flew round; he was smaller than the female, and the white edges to the scapular feathers were very conspicuous. The foundation of the nest several inches below the surface of the water rested on bent-down rushes.”

Layard found nests of these birds in a swamp close to the Royal Observatory near Capetown, and also on the Berg river in September; Ayres on October 25, near Potchefstroom, and Butler on several occasions in September and October, near Newcastle, in Natal; while Capt. Moore of the Army Pay Department has kindly allowed me to reproduce the accompanying photographs of nests found by him on the Cape flats near Cape Town in September and October, 1900 and 1901.

Genus XXIV. **POLYBOROIDES.**

Type.

Polyboroides, *Smith, S. A. Quart. Journ.* i, p. 106 (1830)...*P. typicus*.

Bill somewhat compressed and hooked, not toothed; nostrils horizontal; a bare patch of skin on the side of the face extending round the eye to above the ear-coverts; head crested; tail nearly square of twelve feathers; difference of length between the tibia and tarsus not exceeding that of the hind claw; tarsi somewhat long and slender, nearly three times the length of the middle toe without claw, covered with polygonal scales; the tarsal joint very flexible; toes somewhat short and compressed, the outer and middle toes connected at the base by a slight web.

This genus contains two species only, one of which is confined to Madagascar, the other spread over the greater part of Africa.

554. *Polyboroides typicus*. *Harrier Hawk*.

Polyboroides typicus, *Smith, S. Afr. Quart. Journ.* i, p. 107 (1830); *id. Illus. Zool. S. Afr. Aves*, pls. 81, 82 (1843); *P. L. Sclater, P.Z.S.* 1863, p. 162; *Layard, B. S. Afr.* p. 32 (1867); *Gurney, Ibis*, 1868, p. 146; *Sharpe, Cat. B. M.* i, p. 48 (1874); *id. ed. Layard's B. S. Afr.* pp. 9, 795 (1875-84); *Gurney, Ibis*, 1875, p. 221; *Butler, Feilden,*

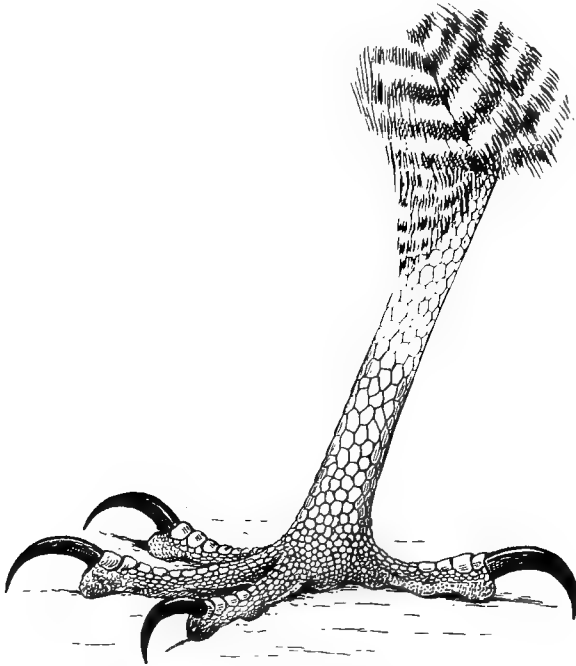


FIG. 131.—Foot of *Polyboroides typicus*. $\times \frac{3}{4}$.

and Reid, Zool. 1882, p. 128 [Newcastle]; *Fleck, Journ. Ornith.* 1894, p. 292 [Gt. Namaqualand]; *Shelley, B. Afr.* i, p. 153 (1896); *Woodward Bros. Natal B.* p. 140 (1899); *Alexander, Ibis*, 1900, p. 438 [Zambesi]; *Reichenow, Vög. Afr.* i, p. 531 (1901).

Polyboroides radiatus (*nec Scop.*), *Gurney, Ibis*, 1859, pp. 153, 237 [Natal]; *id. Descrip. Cat. Rapt. Bds.* p. 12 (1861); *id. Ibis*, 1862, p. 35.

Description. *Adult male.*—General colour above, slaty-grey, some of the feathers of the back of the head elongated to form

a slight crest; primaries, outer secondaries and primary coverts black, the tips edged with white, and the inner primaries and secondaries slaty at the base, inner secondaries slaty-grey, with a round, subterminal spot of black; lower back and upper tail-coverts banded black and white; tail-feathers black with a terminal edging of white and broad bar of mottled black and white two-thirds of the way down the feather; below, throat and chest like the back; abdomen, thighs, and under tail-coverts banded black and white; the band on the tail-feathers below is almost pure white.

Iris blackish-brown; bill black, paler at the base; cere, bare skin round the eye and legs yellow; claws black.



FIG. 132.—*Polyboroides typicus*. $\times \frac{2}{15}$.

Length 25·5, in flesh 24·75; wing 18·0; tail 11·75; tarsus 3·30; culmen 1·5.

The female resembles the male but is larger; length about 29·0; wing 19·0; tail 13·0; tarsus 3·80; culmen 1·5.

A young female is dark brown above with paler edges to the feathers; head crested, pale brown with dark brown centres to the feathers, bare patch round the eye clothed with very short black feathers; the primaries are black, the tail very dark brown with paler edging to the tip, but no trace of the cross band of the adult; below the neck and breast are dirty white with dark brown shaft streaks to the feathers, the abdomen and thighs are pale brown with faint traces of darker bands.

A somewhat older bird resembles the adult except that the top of the head is pale brown with dark brown centres to the feathers.

Distribution.—This bird is found throughout the greater part of Africa south of the Sahara, from the Gambia, Nubia, and Abyssinia southwards. In South Africa it is widely distributed, though nowhere common. The following are recorded localities: Cape Colony—Paarl, Swellendam and George (Layard), Knysna (Marais), Albany district (Grahamstown Mus.), Oleyvenhouts Drift on the Orange river (Bradshaw in S. A. Mus.), Port St. John's (S. A. Mus.); Natal—Pinetown (Stark), near Newcastle (Butler), Great Namaqualand (Fleck); Rhodesia—Chobe river (Bradshaw), Chishomba on the Zambesi (Alexander).

Habits.—But few observations have been made on the habits of this somewhat rare and curious Hawk; Mr. Ayres observed it where the grass had been burnt off stalking along like a Bustard and picking up insects which, together with lizards, frogs, and snakes, appear to form the greater part of its diet. The Woodwards state that Mr. Graham Hutchinson informed them that these birds have a curious habit of settling on the trunk of a tree somewhat in Woodpecker fashion, but with outspread wings, hunting for insects on the bark.

As a general rule, however, they are found seated on tree stumps near marshes and vleis, watching for frogs. Dr. Stark observed that their flight when near the ground was somewhat heavier than that of a Harrier, but that when soaring it was light and graceful; he further noted that they fly with their legs stretched out under their tails.

The legs of this hawk have extraordinary mobility, they can be bent forwards as well as backwards at the tarsal joint, a fact first noticed by Ayres, but of which no satisfactory explanation has yet been given.

Nothing appears to be known about the breeding habits of this bird.

Family II. VULTURIDÆ.

This family is only distinguished from the *Falconidæ* by having the head bare or covered with down, never with feathers. It is confined to the Old World, being replaced in the New by the Condors (*Cathartidæ*) which certainly form a distinct family, perhaps a distinct order.

Key of the Genera.

- A. Bill stout.
- a. Nostrils a narrow vertical slit.
- a¹. Tail-feathers fourteen in number *Gyps*, p. 383.
- b¹. Tail-feathers twelve in number *Pseudogyps*, p. 388.
- b. Nostrils round or oval.
- a¹. A fleshy wattle on either side of the neck;
crown naked *Otogyps*, p. 389.
- b¹. No wattle, crown covered with a thick cushion
of down *Lophogyps*, p. 391.
- B. Bill slender and elongated; nostrils horizontal.
- a. Plumage white, fourteen tail-feathers *Neophron*, p. 393.
- b. Plumage brown, twelve tail-feathers *Necrosyrtes*, p. 396.

Genus I. **GYPS.***Type.***Gyps**, *Savigny, Syst. Ois. d'Egypte*, p. 231 (1809)..... *G. fulvus*.

Bill short and stout, its length along the culmen without the cere being about twice its breadth at the nostrils; the nostrils narrow almost perpendicular slits along the outer edge of the cere; head and neck bare or covered only by down or hairs; wings long reaching beyond the tail; fourteen tail-feathers; tarsus short, about equal to the middle toe, partially clothed with feathers.

The seven generally recognised species of this genus are spread over southern Europe, central and southern Asia as far as the Malay Peninsula and Africa; two species only enter our limits.

Key to the Species.

- A. Feathers of the lower back and rump with a paler shaft stripe..... *G. kolbii*, p. 383.
- B. Feathers of the lower back and rump brown with fulvous tips *G. rueppelli*, p. 386.

555. **Gyps kolbii.** *Kolbe's Vulture.*Le Chasse-fiente, *Levaill. Ois. d'Afr.* i, p. 44, pl. 10 (1799).Vultur kolbii, *Daud. Traité* ii, p. 15 (1800).Vultur fulvus (*nec Gmel.*) *Smith, S. A. Quart. Journ.* i, p. 11 (1830).

Gyps fulvus, *Gurney, Ibis*, 1859, p. 236 [Natal]; *id. Descript. Cat. Rapt. B.*, p. 69 (1861); *Layard, B. S. Afr.* p. 6 (1867); *Gurney, Ibis*, 1868, p. 463; *Layard, Ibis*, 1869, p. 68 [Nesting at Nelspoort]; *Ayres, ibid.* p. 286 [Limpopo]; *Oakley, Trans. Phil. Soc.* ii, p. 46 (1881).

Gyps kolbi, *Blyth, Ibis*, 1870, p. 157; *Gurney in Andersson's B. Damaraland*, p. 5 (1872); *Sharpe, Cat. B. M.* i, p. 8, pl. 1 (1874); *Buckley, Ibis*, 1874, p. 358; *Sharpe, ed. Layard's B. S. Afr.* pp. 1, 793 (1876-84); *Butler, Feilden, and Reid, Zool.* 1882, p. 166 [Newcastle]; *Shelley, Ibis*, 1882, p. 237 [Mashonaland]; *Holub & Pelzeln, Orn. Süd-Afr.* p. 14 (1882); *Distant, Transvaal*, p. 69 (1892) [Pretoria]; *Shelley, B. Afr.* i, p. 154 (1896); *Woodward Bros. Natal B.* p. 136 (1899); *Marshall, Ibis*, 1900, p. 254 [Mashonaland]; *Reichenow, Vög. Afr.* i, p. 517 (1901).

"Aasvogel," *i.e.*, carrion bird or "Witte aasvogel" of Dutch. "Xalanga" of Amaxosa (Stanford). "Inge" of Natal Zulus.

Description. *Adult.*—Head and upper part of the neck covered with sparse dirty white down or hair; at the base of the back of the neck a ruff of decomposed dirty white feathers; general colour of the back including the wing and upper tail-coverts pale ashy-fulvous,



FIG. 133.—*Gyps kolbi*. $\times \frac{1}{2}$.

nearly all the feather with dark brown bases which here and there show themselves, especially on the rump and upper tail-coverts, giving a mottled appearance to these parts, a pale shaft stripe on the lower back and rump; primary quills and tail-feathers black, the secondaries a little more ashy and tipped with pale ashy-fulvous; crop patch dark brown; rest of the under-surface including the under wing and tail-coverts white with a slight creamy tinge.

Iris reddish-yellow or dark hazel; bill horn colour; cere livid; naked skin of head and neck, legs and feet, livid blue.

Length 47·0; wing 28·0; tail 12·0; culmen 3·40; tarsus 4·25; weight of an adult 32 lbs. (Distant).

A young bird has the ruff composed of lanceolated brown-edged

feathers; the brown mottling of the back and wings is more marked; the lower throat (crop patch) is a very pale brown, and the feathers of the whole of the rest of the under-surface including the under tail-coverts are broadly edged with brown, producing a striped appearance throughout.

Distribution.—This is the commonest of the South African Vultures and is found throughout the country in suitable localities as far north as Damaraland on the west, where Andersson met with it sparingly about the Swakop river and, Mashonaland on the east, where it is stated to be not uncommon by Ayres and Marshall.

Formerly this Vulture was excessively abundant in the Cape Peninsula itself, and even in the streets of Capetown, as is related by Levaillant; even Layard when he wrote his work (*i.e.*, 1867), states that it “still lingers in the neighbourhood of Capetown.” It has not, however, been seen in the Cape district now, so far as I am aware, for many years. It has also become much rarer of late throughout the Colony, though Dr. Schönland informs me that it has lately been seen again in the neighbourhood of Grahamstown. One reason given for its extermination is the widespread practice of laying poisoned meat about the farms for the destruction of ravaging carnivora, while another reason often given is that all the vultures went north to Central Africa some years back when rinderpest was ravaging the cattle and game there, and that they have not returned. They are said, however, to be now returning in considerable numbers owing to the quantity of carcasses of horses and cattle spread over the country in consequence of the war.

Habits.—The Aasvogel has its dwelling place in company with many other individuals on the face of some steep krantz or cliff overlooking the surrounding karoo or grassy plain; here they spend the night, and at early dawn issue forth one by one to take up their stations, soaring at a great height each above a selected area of country. As soon as a dead animal is observed down swoops the nearest Vulture, and the others observing the action of the first, also move in the same direction, so that where a few minutes previously not one single bird was visible, now a rapidly increasing crowd is collected. Antelopes and game of all kinds and cattle form their favourite food, horses and donkeys are not so much relished, while it is stated that they never touch human bodies. Both fresh and decomposed carcasses are eaten, and a beginning is usually made with the eyes and tongue. While eating a good deal of noise is made, a kind of grating cry of anger. After their hunger is satisfied

they are frequently so gorged that they are unable to fly and can only waddle off to a resting place near by to await the relieving process of digestion.

Instances have been recorded of vultures attacking living animals, and the Woodward's state that they have seen this species attack full grown sheep, while lambs and kids are frequent victims.

There can be but little doubt that the Vulture is guided to his food by sight and not by scent; apart from other arguments one of the most convincing is the fact that a dead antelope concealed by branches of trees or bushes is perfectly safe from their attacks for any length of time, while one exposed to view will probably be discovered almost at once.

This Vulture nests early. Mr. Henry Jackson, a correspondent of Mr. Layard's, obtained a very fine series of eggs at a breeding place near Nelspoort in the Beaufort West district. The krantz, on the ledges of which the nests are built, is from 400 to 500 feet in height and nearly perpendicular, so that it is only possible to reach the eggs by means of a rope from the top. The nests, composed of sticks, bushes, and grass, in the form of a shallow plate, are about two feet in diameter and contain one egg each; these are, when fresh, of a dull bluish-white, some slightly speckled with brown and others plain; all are dirty and slightly stained by the bird itself; they measure about 3.5×2.75 .

Messrs. Ayres, Buckley, and Eriksson, found that this Vulture nested in tall trees, generally mimosas, along the banks of Limpopo; the last-named collector states that he found a nest on August 13 situated in the topmost branches of a large tree; it was a flat structure of considerable size, formed of sticks, and contained one young bird which could only have been hatched a couple of days.

The Woodward's have also observed it breeding both on the krantz overhanging the Umtroahumi river in the Alexandra district of Natal and in high fir trees on the banks of the Pongola river in Zululand.

556. **Gyps rueppelli.** *Rüppell's Vulture.*

Vultur kolbii (nec Daud.), *Cretzsch. Atl. Rüpp. Vög.* p. 47, pl. 32 (1826).

Vultur rueppelli, *Brehm, Naum.* 1852, pt. 3, p. 44.

Gyps fulvus (nec Gmel.), *Layard, B. S. Afr.* p. 7 (1867).

Gyps rueppelli, *Gurney. Ibis*, 1860, p. 206 [Natal]; *id. Descript. Cat. Rapt. B.* p. 73 (1861); *id. in Andersson's B. Damaraland*, p. 5 (1872);

Sharpe, Cat. B. M. i, p. 9 (1874); *Buckley, Ibis*, 1874, p. 358; *Sharpe, ed. Layard's B. S. Afr.* pp. 3, 793 (1875-84); *Gurney, Ibis*, 1875, p. 90; *Shelley, Ibis*, 1882, p. 237 [Mashonaland]; *Ayres, Ibis*, 1885, p. 341 [Potchefstroom]; *Shelley, B. S. Afr.*, p. 154 (1896); *Reichenow, Vög. Afr.* i, p. 518 (1901).

Description. *Nearly adult.*—Down on head golden-yellow; ruff yellowish-white; interscapulars and scapulars dark brown with a conspicuous crescentic edging of fulvous white; wing-coverts creamy-white, the brown bases showing plainly on the median and greater series, the latter tipped with creamy-white as also are the inner secondaries; quills black washed with chocolate-brown; lower back and rump dark brown narrowly edged with creamy-white, upper tail-coverts more broadly; tail black; crop patch deep chocolate-brown; under surface dull creamy-buff, some of the flank feathers showing brown bases; under wing-coverts dark brown with cream-coloured tips (Sharpe).

Iris nearly black; bill clear horn, darker or almost black in the young; cere black; feet black.

Length (male) 27; wing 22.5; tail 10.5; tarsus 4.0 (Ayres).

Distribution.—From Egypt, Abyssinia and the Upper Nile Valley, extending to Natal; not hitherto noticed in Nyasaland or German east Africa except doubtfully once by Neumann.

In South Africa this species has been seldom noticed and must be very rare. The following are the recorded localities: Natal, Potchefstroom and Mashonaland (Ayres); Ondonga in Ovampoland (Andersson).

Habits.—Rüppell's Vulture does not seem to differ from the common species except in its more marked preference for trees. Mr. Ayres* states that his brother found this species nesting in considerable numbers about thirty miles down the Vaal river (from Potchefstroom) in 1884; the nests were ponderous structures of rough sticks placed on the tops of large and thorny mimosas; only one egg was taken, on June 15; it was somewhat incubated and was the only one in the nest. It was white sparsely and rather faintly marked with reddish-brown spots of eccentric shape, rather more numerous distributed towards the obtuse end of the egg than elsewhere; the shell was rough and chalky and the egg measured 3.75 × 2.75. It is possible that the birds noticed nesting on the Limpopo and referred to *G. kolbii* may really have been of the present species.

* Capt. Sparrow believes that this account refers to the next species.

Genus II. PSEUDOGYPS.

*Type.***Pseudogyps**, *Sharpe, Ann. Mag. N. H.* (4) xi, p. 133(1873)P. *bengalensis*.

This genus resembles *Gyps* except for the fact that it has only twelve instead of fourteen tail-feathers. Two species very similar to one another are known, one from India and the Malay Peninsula, the other from tropical Africa, which latter just enters our boundaries.

557. **Pseudogyps africanus.** *African White-backed Vulture.**Gyps africanus*, *Salvad. Not. R. Accad. Torin.* p. 133 (1865).

Pseudogyps africanus, *Sharpe, Cat. B. M.* i, p. 12 (1874); *Bocage, Orn. Angola*, p. 1, pl. ix (1881); *Sharpe, ed. Layard's B. S. Afr.* p. 794 (1884); *Shelley, B. Afr.* i, p. 154 (1896).

Description. Adult.—General colour deep brown, some of the feathers of the back and wing-coverts blackish-brown; lower back and rump pure white; upper tail-coverts brown, some inclining to blackish; quills and tail black, the latter with only twelve feathers, the secondaries with an external ashy-grey shade; ruff white, rather scanty, crop patch brown; rest of the under-surface a pale brown with very narrow yellowish-white shaft lines.

Iris umber-brown; bill brownish-black; the culmen yellowish; feet dusky plumbeous.

Length 30·0; wing 22·0; tail 9·0; culmen 3·2; tarsus 4·5.

An immature female is fulvous-brown, the secondaries lighter and more ashy; quills and tail blackish-brown, the former externally shaded with greyish; below, brown, paler and more fulvescent in the centre of the body, the feathers with pale fulvous-white streaks very indistinct.

Distribution.—Tropical Africa from Senegambia and Abyssinia southwards to Angola and German east Africa.

This Vulture hardly comes within our limits,* it has been obtained, however, by Senor Anchieta at Humbe on the Cunene river in southern Angola, and will probably be found in the northern portions of German south-west Africa.

* Capt. Sparrow of the 7th Dragoon Guards has recently informed me that he found this Vulture quite common near Potchefstroom. It breeds in the middle of June, building a very large nest in big thorns and other trees and laying one egg only.

Genus III. **OTOGYPS.***Type.***Otogyps**, Gray, *List Genera Bds.* p. 2 (1841)..... *G. auricularis*.

Bill short but deep and strongly hooked; nostrils a vertical oval wider than in *Gyps*; head and neck bare in the adults; along the neck from below the ear runs a bare wattle of skin of varying development; tail-feathers twelve in number; tarsus longer than the middle toe without claw, the upper half covered with down.

This genus, consisting of two species, is spread over southern Europe and Africa extending eastwards to India and Cochin China. One species is found within our limits.

558. **Otogyps auricularis.** *Black Vulture.*

L'Oricou, *Levaillant, Ois. d'Afr.* i, p. 36, pl. 9 (1799).

Vultur auricularis, Daud. *Traité*, ii, p. 10 (1800); Burchell, *Travels*, i, pp. 377, 501 (1822) [Griquatown]; Smith, *S. A. Quart. Journ.* i, p. 13 (1829); Gurney, *Descript. Cat. Rapt. B.* p. 57 (1861); Ayres, *Ibis*, 1869, p. 287 [Orange River Colony].

Otogyps auricularis, Gurney, *Ibis*, 1859, p. 235 [Natal]; *id.* *Andersson's B. Damaraland*, p. 2 (1872); Sharpe, *Cat. B. M.* i, p. 13 (1874); *id.* *ed. Layard's B. S. Afr.* pp. 4, 793 (1875-84); Barratt, *Ibis*, 1876, p. 194; Oates, *Matabeleland*, p. 297 (1881); Holub & Pelzeln, *Orn. Süd-Afrikas*, p. 11 (1882); Butler, Feilden, and Reid, *Zool.* 1882, p. 167; Shelley, *B. Afr.* i, p. 154 (1896); Woodward Bros. *Natal B.* p. 137 (1899); Marshall, *Ibis*, 1900, p. 255 [Mashonaland]; Reichenow, *Vög. Afr.* i, p. 512 (1901).

“Zwarte Aasvogel” of Dutch.

Description. *Adult.*—Head and neck with no down but with a few bristles, most abundant on the chin where they are black; above the eye a row of large black eyelashes and round the ear opening a few bristles; a narrow fold of skin about a quarter of an inch wide and about four inches long runs from in front of the ear down the neck and forms a kind of lappet; this structure varies a good deal in development and has often disappeared in stuffed specimens; round the hinder part of the lower neck a ruff of brown feathers not meeting in front but extending slightly up the back of the neck; general colour above brown, becoming quite black on the wings and tail, scapulars and wing-coverts edged with paler; crop patch dark brown; lower surface including the thighs thickly clothed with white down, through which project on the breast and abdomen narrow lanceolate feathers of dark brown edged with paler; feathers of the underwing- and tail-coverts brown more rounded in shape.

Iris dark brown; bill greenish-brown, tip yellow; cere bluish-lavender; bare skin of head and neck varying from vermilion to pale flesh; tarsus and feet pale bluish.

Length about 48·0; wing 31·0; tail 14·0; culmen 5·0; tarsus 5·40.

Another specimen, probably a young bird, has traces of down feathers on the head and neck; some of the feathers of the upper part of the back are tipped and edged with pale ashy-fulvous giving that part a mottled appearance; the down on the thighs and legs is brown and not white. A nestling is covered with white down.

Distribution.—The Black Vulture, though never so abundant as the Kolbe's Vulture, is widely spread all over South Africa from the



FIG. 134.—*Otogyps auricularis*. Copied from a drawing in the possession of Mr. J. H. Gurney, taken by Wolf from life. $\times \frac{5}{7}$.

Colony to the Zambesi. It does not yet appear to have been noticed in Angola, Nyasaland (except on one occasion), or German east Africa, and the eared vulture of north-east Africa is now generally considered to be a distinct species.

In South Africa this Vulture is now scarce; the South African Museum possesses specimens from Malmesbury and Swellendam,

while Layard states that there was formerly a nesting place near Frensch Hoek. Buckley procured eggs from Salt River Vlei in Beaufort West; and there is an example in the Grahams-town Museum from the Koonap river in the Albany district. Oates obtained a specimen on the river Umvungu between Bulawayo and Salisbury and Andersson states that it is the commonest vulture in Great Namaqualand and Damaraland.

Habits.—The Black Vulture appears to be a solitary bird and is generally seen singly or in pairs at ordinary times; though often noticed with the Kolbe's Vulture round a carcass, it is nearly always in smaller numbers. Ayres states that it is a more wary bird and more difficult to procure than the other species. Its breeding habits have been observed by Verreaux near the Olifant river, by Layard near Frensch Hoek in the Paarl division, by Ayres in the Orange River Colony, and by Buckley at Salt River Valley in the Beaufort West division.

It builds a very large nest in the upper branches, usually of a low thorn tree; the nest is composed of coarse sticks lined with finer sticks, wool, and lumps of hair, and is of great size, measuring about 4 feet in diameter and is slightly concave above. Only one egg is laid, in June or July, this is of a dirty white colour sometimes plain, sometimes spotted with deep red-brown especially at the obtuse end. One taken by Buckley measured 3.48 × 2.76.

Genus IV. **LOPHOGYPS.**

Type.

Lophogyps, *Bp. Rev. Mag. Zool.*, 1854, p. 531.....L. *occipitalis*.

Bill not so powerful or strong as in *Otogyps*; nostrils a vertical or slightly diagonal oval; crown and occiput covered with a thick cushion of soft down; tail-feathers twelve in number; tarsus longer than the middle toe without claw, only the upper fourth covered with feathers.

Only one species, confined to tropical and South Africa, is recognised.

559. **Lophogyps occipitalis.** *White-headed Vulture.*

Vultur occipitalis, *Burchell, Travels*, ii, p. 329 (1824); *Cretschm. in Rüpp. Atlas*, p. 33, pl. 22 (1826); *Smith, S. A. Quart. Journ.* i, p. 15 (1829); *Gurney, Ibis*, 1859, p. 235 (Natal); *id. Descript. Cat. Rapt. Bds.* p. 65 (1861); *Layard, B. S. Afr.* p. 5 (1867); *Ayres*,

Ibis, 1869, p. 287; *Gurney in Andersson's B. Damaraland*, p. 4 (1872).

Lophogyps occipitalis, *Sharpe, Cat. B. M.* i, p. 15 (1874); *id. ed. Layard's B. S. Afr.* pp. 5, 793 (1875); *Shelley, Ibis*, 1882, p. 237 [Mashonaland]; *Butler, Feilden, and Reid, Zool.* 1882, p. 167 [Natal]; *Fleck, Journ. Ornith.* 1894, p. 392 [Gt. Namaqualand]; *Shelley, B. Afr.* i, p. 154 (1896); *Reichenow, Vög. Afr.* i, p. 515 (1901).

Description. Adult.—Crown of the head to half way between the eyes and nostrils and behind to below the occiput covered with a dense white down; sides of the face and chin including a space



FIG. 135.—*Lophogyps occipitalis*. $\times \frac{2}{3}$.

round the eyes and ear openings bare with a few scattered white bristles; lower neck bare all round; at the base of the neck behind is a black ruff not meeting in front; general colour above, very dark brown, a little paler on the rump; some of the median coverts edged with paler brown; primaries and tail-feathers black; secondaries dark brown, the inner ones washed with silvery; below, crop patch, thighs, lower abdomen, and under tail-coverts white; breast, upper abdomen, and sides of the body very dark brown; greater under wing-coverts white, median and lesser brown.

Iris umber-brown; bill red, darker at the tip; cere bluish; naked skin of head and neck pale lilac; feet pinkish flesh.

Length 40·0; wing 25·0; tail 11·0; culmen 3·5; tarsus 4·25.

The young bird is paler brown throughout with the dark brown feathers everywhere appearing; the down on the head, crop patch, white wing-feathers, and abdomen, tinged here and there with brownish.

Distribution.—The White-headed Vulture was first discovered by Burchell on the Makkwari or Matlowing river, near Kuruman. It appears to be rare everywhere in South Africa and is not known from south of the Orange river. Beyond our limits it is recorded from German east Africa by Reichenow, and appears to be not uncommon in Abyssinia and Senaar; it has also been obtained at Bissao in Portuguese west Africa; South African localities are: Cape Colony—Kuruman (Moffat), Douglas in Griqualand West (Orpen in S. A. Mus.); Natal—Ingagane near Newcastle (Reid); Bechuanaland—Near Lake Ngami (Andersson); German south-west Africa—Nauas in Great Namaqualand (Fleck); Mashonaland (Ayres).

Habits.—The White-headed Vulture is nowhere common in South Africa and little has been recorded concerning its habits. Mr. Ayres, almost the only naturalist who has written on the subject, states that it is shy and wary, and is found usually in pairs, and is not generally seen feeding along with other species; he further states that it builds in trees like the Black Vulture and at about the same time, and only lays one egg. This is white with a few faint brown cloudings; it is thinner in texture and somewhat more elongated than those of other Vultures, and measures about 3.93×2.68 .

Genus V. **NEOPHRON.**

Type.

Neophron, *Savigny, Syst. Ois. d'Egypte*, p. 238

(1808)N. perenopterus.

Bill weak, long and slender, the cere occupying more than half its length; nostrils an elongated horizontal slit; sides of the head, fore part of the crown and throat bare, occiput and hind neck fully feathered; tail-feathers fourteen in number, considerably graduated, the difference between the inner and outer feathers almost equal to the length of the tarsus; tarsus a good deal longer than the middle toe and only feathered at the top.

This genus contains two species spread over southern Europe, Africa, and southern Asia; one of these inhabits South Africa.

560. **Neophron percnopterus.** *Egyptian Vulture.*

Vultur percnopterus, *Linn. Syst. Nat.* i, p. 123 (1766).

L'Ouri-gourap, *Levaill. Ois. d'Afr.* i, p. 62, pl. 14 (1799).

Neophron ægyptiacus, *Smith, S. A. Quart. Journ.* i, p. 16 (1829).

Neophron percnopterus, *Gurney, Ibis*, 1859, p. 236 (Natal); *id. Descript. Cat. Rapt. B.* p. 50 (1861); *Layard, B. S. Afr.* p. 3 (1867); *Gurney in Andersson's B. Damaraland*, p. 1 (1872); *Sharpe, Cat. B. M.* i, p. 17 (1874); *id. ed. Layard's B. S. Afr.* pp. 6, 794 (1875-84); *Butler, Feilden, and Reid, Zool.* 1882, p. 167; *Shelley, B. Afr.* i, p. 155 (1896); *Woodward Bros. Natal B.* p. 137 (1899); *Marshall, Ibis*, 1900, p. 255 [Mashonaland]; *Reichenow, Vög. Afr.* i, p. 521 (1901).

"Pharoah's Hen" or "Pharoah's Chickens" of English; "Witte Kraai" (*i.e.*, White Crow) of the Dutch.

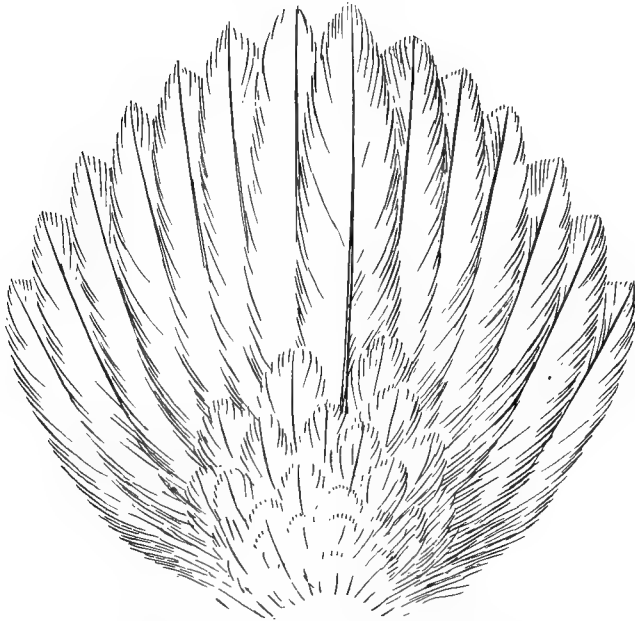


FIG. 136.—Tail of *Neophron percnopterus*.

Description. *Adult.*—Top of the head, sides of the face and throat bare, except for a few scattered bristles and feathers in front of the eye; the feathers commencing on the occiput and continuing down the back of the neck, those on the occiput lanceolate and erect forming a ruff; general colour throughout a dirty white slightly tinged, especially on the neck, with pale rufous; winglet

and primaries black, the latter edged along the base of the outer web with ashy; secondaries very dark brown also ashy along the middle portion of the outer web but becoming brown again at the tips.

Iris dark brown in young, deep red in adult; bill pale horny-brown; cere and naked portions of the head and neck yellow to orange; legs dirty yellow; claws horny-brown.

Length 31; wing 21.25; tail 11.0; culmen 3.25; tarsus 3.80.

Young birds are at first blackish-brown; the scattered down on the head and throat black; pale tips begin gradually to appear on the neck, heckles, and breast-feathers giving a speckled appearance; the bill is dark, the naked parts of the head and throat grey; legs

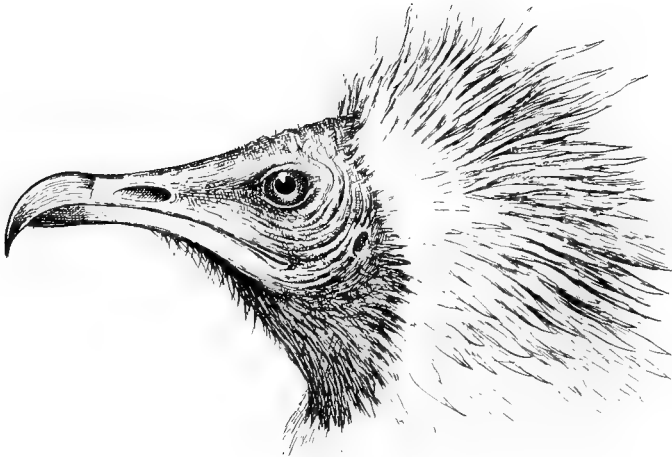


FIG. 137.—*Neophron percnopterus*. $\times \frac{1}{2}$.

and feet ashy. The change to the adult plumage is gradual. In confinement the full plumage is not attained till the third year.

Distribution.—The Egyptian Vulture is found throughout southern Europe and has been twice killed in England; it extends eastwards through Persia to north-west India. It inhabits north Africa from Morocco to the Red Sea and thence down the eastern side of that continent to Cape Colony. It is not known from west Africa.

Within our limits this Vulture appears to be widely distributed though nowhere very common; in the Colony it is stated to have bred at Hopefield in the Malmesbury district, near Swellendam, at

East London (where it frequents the krantjes along the Buffalo river) and Colesberg, and it has been seen recently near Aliwal North, on the Orange River by Lieut. C. H. T. Whitehead; in Natal it is only found in the upper districts, having been observed by Reid near Colenso and by Butler near Newcastle; according to Kirby it swarms in the eastern Transvaal; Andersson states that it is not uncommon in Great Namaqualand and Damaraland; and finally in Mashonaland it has only once been seen by Marshall.

Habits.—This Vulture is seldom seen in large numbers except occasionally round a carcass; usually they are in pairs and haunt a particular locality. In their habits they are even more filthy than other Vultures, feeding largely on human and other excrement and picking the bones of dead animals abandoned by others. Mr. Gurney states that in the country about the Orange river they prey on the eggs of the Ostrich, which they break by dropping upon them a stone carried up into the air for the purpose.

This Vulture breeds on a krantz making a large nest of sticks and lining it with hair and wool; two eggs are laid; those in the South African Museum from Hopefield and Colesberg are of a dirty white ground colour which is only visible at one end of the egg, the other being entirely blotched and streaked with rich reddish-brown of two shades. In other cases they are said to be almost pure white and unspotted. In shape they are broad ovals measuring on an average 2.70×2.30 .

This bird is sometimes said to be only a winter visitor to South Africa, but of this statement I have come across no first-hand evidence; it certainly nests in the Colony and must I think be considered a resident until further facts are brought forward.

Genus VI. **NECROSYRTES.**

Type.

Necrosyrtes, *Gloger, Handb. Naturg.* i, p. 236

(1842) N. monachus.

Bill like that of *Neophron*, slender, but with a much smaller and more rounded nostril; crown, sides of the head and throat bare of feathers except for a few scattered bristles; back of the head and nape of the neck with a thick coating of soft, downy feathers and with ruff of upstanding feathers as is *Neophron*; primaries and secondaries about equal in length, the difference between them less than an inch; tail nearly even, not graduated, of twelve feathers; plumage sooty-brown.

Only two species of this genus are usually recognised—the type species from north-east Africa and the South African form described below.

561. $\frac{f}{L}$ **Necrosyrtes pileatus.** *Hooded Vulture.*

Vultur pileatus, *Burchell, Travels*, ii, p. 195 (1824).

Neophron carunculatus, *Smith, S. Afr. Quart. Journ.* i, p. 17 (1829).

Neophron pileatus, *Gurney, Ibis*, 1859, p. 236 [Natal]; *id. Descript. Cat. Rapt. B.* p. 53 (1861); *Layard, B. S. Afr.* p. 4 (1867); *Gurney, Ibis*, 1868, p. 137; *id. in Andersson's B. Damaraland*, p. 2 (1872); *Sharpe, Cat. B. M.* i, p. 18 (1874); *id. ed. Layard's B. S. Afr.* pp. 7, 794, (1875-84); *Oates, Matabeleland*, p. 297 (1881) [nr. Tati]; *Shelley, Ibis*, 1882, p. 237 [Mashonaland]; *Fleck, Journ. Ornith.* 1894, p. 392 [Gt. Namaqualand]; *Shelley, B. Afr.* i, p. 155 (1896); *Marshall, Ibis*, 1900, p. 255 [Mashonaland]; *Alexander, ibid.* p. 438 [Zambesi Valley].



FIG. 138.—*Necrosyrtes pileatus.* $\times \frac{2}{3}$.

Description. *Adult.*—General colour above, chocolate-brown; quills and tail black; crown of the head, sides of the face, throat, and fore neck bare; eyelashes and bristles on the lores black; hind neck up to the occiput covered with a thick, fluffy down of a whitish colour tinged with brown; crop patch pale creamy-brown, encircled on its upper and lower margins by conspicuous patches of white down; inner surface of the thighs also covered with white down.

Iris dark brown to bluish-black; bill greenish-black, dark horn

towards the tip; cere and bare skin of head and neck bluish to purplish-flesh, brighter about the eyes; legs bluish-flesh.

Length about 26·0; wing 20·0; tail 10·5; culmen 2·7; tarsus 3·7.

The young is very similar to the adult, but the down on the hind neck, crop patch, and thighs is dark brown and not white.

Distribution.—The Hooded Vulture is confined to south and east Africa; it is apparently very rare in the southern half of our region but becomes common towards the Zambesi. It was first obtained by Burchell in the country which now forms the Prieska and Hope Town districts bordering the Orange river, south of which it does not appear to be known. Ayres states that it is found in Natal but gives no exact locality. It is rare in Damaraland, though more abundant in Great Namaqualand according to Andersson and Fleck. In Rhodesia it was procured at Tati by Oates, and is stated by Marshall to be not uncommon in the Salisbury district of Mashonaland, while Alexander notes it from near Zumbo on the Zambesi.

Beyond our limits it has been obtained on the Nyika plateau in Nyasaland and in German east Africa. In north-east and west Africa it is replaced by a closely-allied species.

Habits.—Marshall states: "This Vulture is fairly common and may be at once recognised by its smaller size and pink head. It seems to be rather afraid of its two larger relatives, and does not usually visit a carcass at the same time with them but contents itself with the pickings after they have left."

Its breeding habits in South Africa have not been observed, but in north-east Africa the allied species builds in tall mimosa trees a nest of variable size but with a very small basin, only just allowing room for one unfeathered nestling. Only one egg is laid; this is dirty-white, sometimes plain, sometimes covered with spots and blotches of reddish-brown, measuring 2·75 × 2·0.

Family III. PANDIONIDÆ.

No after-shafts to the contour feathers; outer toe reversible; plantar tendons as in the owls and hornbills, *i.e.*, the two tendons completely fused so that it is impossible to distinguish their distribution to the various toes; a little bridge of bone on the anterior surface of the proximal end of the tarso-metatarsus over the channel

in which runs the extensor hallucis tendon; other characters as in the *Falconidæ*. In all the points above mentioned the osprey shows a strong approximation to the owls and must be regarded to a certain extent as a link between the diurnal and nocturnal birds of prey.

Genus I. **PANDION.**

Type.

Pandion, *Savigny, Descript. Egypt. Ois.* p. 272 (1809)...*P. haliaëtus*.

Culmen rounded and hooked, mandible slightly festooned but not toothed; nostrils narrow oblique ovals with overhanging mem-

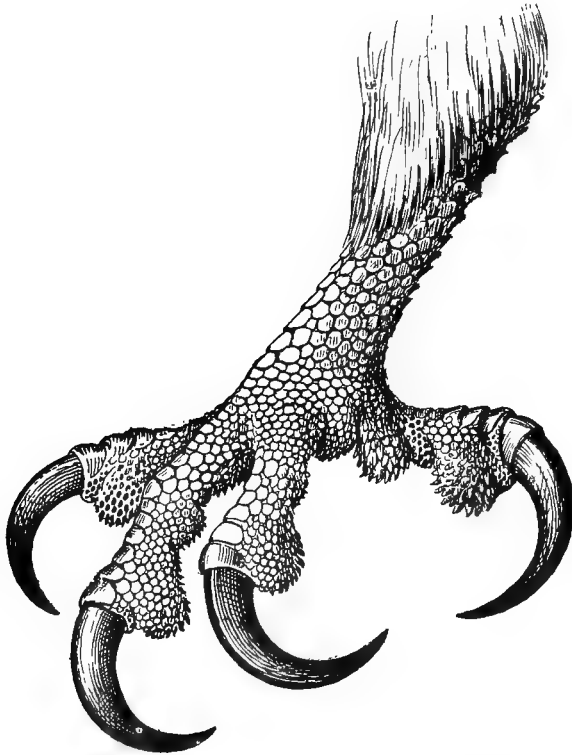


FIG. 139.—Foot of *Pandion haliaëtus*. $\times \frac{9}{10}$.

brane; wings very long, pointed and sickle-shaped, exceeding the tail in length which is short and nearly even; tarsus very short and stout about equal to the middle toe, covered with small granular

scales; toes with a few scutes immediately above the claws with roughened and prickly pads below; the outer toe reversible at will; claws very long, curved and sharp, rounded beneath.

Only one, almost cosmopolitan, species of Osprey is generally recognised, though recently modern writers have divided this wide-ranging form into three geographical races at least.

562. **Pandion haliaëtus.** *Osprey.*

Falco haliaëtus, *Linn. Syst. Nat.* i, p. 129 (1766).

Pandion haliaëtus, *Gurney, Ibis*, 1859, p. 239 [Natal]; *Layard, B. S. Afr.* p. 16 (1867); *Sharpe, Cat. B. M.* i, p. 449 (1874); *Sharpe, ed. Layard's B. S. Afr.* pp. 68, 801 (1875-84); *Dresser, B. Eur.* vi, p. 139, pls. 386, 387 (1876); *Gurney, Ibis*, 1882, p. 204; *Butler, Feilden, and Reid, Zool.* 1882, p. 204 [near Durban]; *Shelley, B. Afr.* i, p. 144 (1896); *Woodward Bros. Natal B.* p. 153 (1899); *Reichenow, Vög. Afr.* i, p. 607 (1901).



FIG. 140.—*Pandion haliaëtus.* $\times \frac{9}{10}$.

Description. *Adult female.*—Above sepia-brown, most of the feathers edged and tipped with whity-brown; head brown with white bases and edges to the feathers so as to give a mottled appearance; a broad white streak from behind the eye running down the sides of the neck; primary quills black; tail almost uniform brown tipped with whity-brown, the outer feathers more or less barred

with white on the inner web; sides of the face and under-parts white throughout, mottled to a greater or lesser extent with brown on the breast; under wing-coverts mottled brown.

Iris yellow; bill black; cere blue; feet bluish-slate.

Length 23.0; wing 19.25; tail 8.0; culmen 1.70; tarsus 2.30.

A young bird has fulvous edgings to the feathers of the upper surface and a tail barred with dark sepia and ashy-brown, the bands about six in number.

Distribution.—The Osprey is one of the most cosmopolitan of birds. It is found throughout the Old World and the greater part of the New, being absent only from the southern half of South America and New Zealand. Recent writers have recognised several species but the differences between them are very slight.

Within our limits the Osprey has been observed about Durban harbour and in the lagoons along the coast by Ayres, Reid, and the Woodwards, but it is not now commonly seen in the immediate neighbourhood of Durban. Dr. Stark observed it about Knysna harbour and Mr. John Wood writes that it is not uncommon near East London, thus confirming Mr. Rickards' doubtful observations of some years back. I have not heard of its being noticed in the neighbourhood of Cape Town or on the west coast of the Colony. There is a living example in the Zoological Gardens at Pretoria, obtained on the Pienaars river not far off that town in 1900.

Habits.—The Osprey frequents the mouths of rivers and shallow water lagoons along the coast. It can be seen perched on a pole or tree or sometimes on the flats near the water. It feeds almost exclusively on fish. For two or three seconds it hovers motionless in the air over a fish, then plunges down and bears away its prey in its claws; these are remarkably curved and sharp, the outer one being reversible and the soles of the feet very rough. Mr. Gordge told the Woodwards that he had seen the Sea Eagle (*Haliaëtus vocifer*) rob the Osprey of his hard-earned prey. The eagle watches until the Osprey plunges into the sea and having grasped a fish in its talons is bearing it away. It starts in pursuit and, circling round, causes it to drop its prey; then darting down with great rapidity, it often catches the fish before it reaches the ground.

Mr. John Wood writes "Along the beach near East London and particularly at our river mouths this bird may be observed now and then. I have never seen more than one at a time. Once when fishing in the surf with a net a lot of mullet were being hauled up

on the sand and an Osprey wheeling about just over head pounced down within four or five yards of us and bore off one of our heaviest fishes. It is a bird of strong flight and with its long sickle-shaped wing can instantaneously alter its course. I have met with it both in summer and winter."

Mr. Gordge, above mentioned, believes that it builds in the high cliffs near Durban, but no definite account of its breeding in South Africa has been given.

Family IV. SERPENTARIIDÆ.

Skull with desmognathous palate and well-developed basiptyergoid processes (see fig. 5, p. 5); ambiens, accessory femoro-caudal, semi-tendinosus, and accessory semi-tendinosus muscles all present; plantar tendons and oil gland as in the *Falconidæ*; after-shaft to contour feathers present; both the inner and outer toe connected with the middle one by a strong basal web.

This family contains only the single species here described.

Genus I. SERPENTARIUS.

Type.

Serpentarius, *Cuvier, Tabl. Elem. d'Hist. Nat.* p.

254 (1790)..... S. secretarius.

Beak with a rounded culmen and strong hook but not so powerful as in other Accipitrine birds; cere narrow with oval nostrils; a considerable bare patch on the side of the face round the eye; a crest of elongated occipital feathers. Legs very long, the tarso-metatarsus about half the length of the wings; a strong and well developed basal web between the three front toes; tail of twelve feathers, the two central ones elongated, the outer ones graduated.

This genus contains one recent species only, spread over the greater part of Africa; another fossil form has been described by M. Milne Edwards from lower miocene deposits in France.

563. **Serpentarius secretarius.** *Secretary Bird.*

De Sagittarius, *Vosmaer, Beschryving van eenen Afrikaanschen Roofvogel*, pp. 1, 8, pl. 8 (1769).

Falco serpentarius, *Sparrman, Resa till Goda Hopps-udden*, p. 160 (1783); *id. English Translation*, 8vo ed. i, p. 162 (1785).

- Otis secretarius*, *Scop. Del. Faun. et Flor. Insubr.* ii, p. 93 (1786).
Le Mangeur de Serpens, *Levaillant, Ois. d'Afr.* i, p. 103, pl. 25 (1799).
Secretarius reptilivorus, *Daud. Traité*, ii, p. 29, pl. 11 (1806).
Serpentarius reptilivorus, *Verreaux, P. Z. S.* 1856, p. 348; *Gurney, Descrip. Cat. Rapt. Bds.* p. 8 (1861); *Layard, B. S. Afr.* p. 33 (1867); *Holub & Pelz. Orn. Süd-Afrikas*, p. 36 (1882).
Gypogeranus serpentarius, *Grill, K. Vet. Akad. Handl. Stockh.* ii, no. 10, p. 50 (1858) [Knysna].
Sagittarius secretarius, *Gurney, Ibis*, 1859, p. 237, and 1860, p. 203 [Natal]; *Gurney in Andersson's B. Damaraland*, p. 34 (1872).
Serpentarius secretarius, *Sharpe, Cat. B. M.* i, p. 34 (1872); *Buckley, Ibis*, 1874, p. 359 [Limpopo]; *Sharpe, ed. Layard's B. S. Afr.* pp. 8, 794 (1875-84); *Barratt, Ibis*, 1876, p. 194; *Butler, Feilden, and Reid, Zool.* 1882, p. 167 [Newcastle]; *Rendall, Ibis*, 1896, p. 166 [Barberton]; *Sowerby, Ibis*, 1898, p. 573 [Mashonaland]; *Woodward Bros. Natal B.* p. 255 (1899); *Marshall, Ibis*, 1900, p. 255 [Mashonaland].
Serpentarius serpentarius, *Shelley, B. Afr.* i, p. 154 (1896); *Sharpe, Hand list*, i, p. 241 (1900); *Reichenow, Vög. Afr.* i, p. 528 (1901).
Other references are *Edwards, Phil. Trans.* lxi, p. 55 (1771); *Moodie, Ten Years in South Africa*, i, p. 319 (1835); *Martin, Home Life on an Ostrich Farm*, p. 26 (1890); *Distant, Transvaal*, p. 68 (1892); *Nicholls and Eglinton, Sportsman, S. Afr.* p. 99 (1892); *Bryden, Gun and Camera*, p. 68 (1893); *Millais, Breath from the Veldt*, p. 26 [sketches] (1895); *Kirby, Haunts Wild Game*, p. 559 (1896); *Newton Dict. Birds*, p. 822 (1896); *Bryden, Nature and Sport*, p. 53 (1897); *Harris, Essays and Photographs*, p. 107, pl. xxvi. (1901).
“Slaang vreter” (Snake eater) or “Secretaris” of the Dutch. “Inxanxosi” of Amaxosa (Stanford). “Intungunono” of the Natal Zulus.

Description. *Adult male.*—General colour above, ashy-grey; eye with a strongly marked row of black eye-lashes; at the back of the head a number of outstanding black feathers of unequal length erectible at will; wing-feathers and primary coverts all black, the other coverts like the back; lower back black narrowly barred with white; upper tail-coverts white; tail-feathers silvery-grey, with a subterminal black and terminal white portion; the two median feathers much elongated, the others duller ashy with two black bars, the subterminal one much the broadest and best marked; below, paler than the back, the feathers of the throat and lower cheeks with pure white shaft marks; tibial feathering and sides of the abdomen black; centre of abdomen and under tail-coverts white.

Iris hazel; upper mandible bluish-white; lower mandible dirty yellowish with a white tip; cere greenish-yellow, naked skin round the eye rich orange; legs and toes pale flesh-coloured, claws black.

Length 56·0; wing 27·0; tail to end of central feathers 24·0; tarsus 13·0; culmen 2·5.

The female is slightly larger and darker.

The young bird is duller; the head feathers form a more or less distinct crest; upper wing- and upper and under tail-coverts marked



FIG. 141.—*Serpentarius secretarius*.

with subterminal brown spots; the black of the thighs and abdomen are marked with cross lines of whitish and the iris is grey. The nestling is covered with white down.

Distribution.—The Secretary Bird is found all over the drier and more open parts of Africa from Gambia in the west and from near

Thebes in Upper Egypt in the north, through Abyssinia and Somaliland to Cape Colony; it is not found in the forest regions of west Africa or Nyasaland and has only been obtained hitherto in the drier and more westerly portion of German east Africa. Some recent authors have considered the northern and western bird sufficiently distinct to be considered a separate species. In South Africa it is found throughout the country, but more abundantly in the higher and drier districts and less commonly in the more wooded parts. It is not uncommon close to Cape Town and in the north-western districts of the Colony, and has been noticed near Port Elizabeth and East London, while the South African Museum possesses examples from the Bredasdorp and Middelburg divisions. In Natal it is common in the upland country, but very rare near the coast, while in the Orange River Colony, Transvaal, Rhodesia and German territories it is widely spread though nowhere very common.

History and Habits.—The Secretary Bird was first made known in Europe in 1769 by Vosmaer, who described a specimen sent to Holland by Heer Hemmy, member of the Board of Justice of the Cape of Good Hope, as a present to the Prince of Orange. In 1770 Edwards saw a live example and described and figured it in the *Philosophical Transactions* of the following year; but the best early account of the bird is to be found in Levaillant's great work.

Secretary birds are usually seen in pairs marching with great deliberation and considerable dignity at some distance apart from one another across the veld in search of food; if disturbed or molested they usually make off at a run. Their pace is very great and they actually seem to skim the ground when briskly pursued. They seldom take to the wing and if compelled to do so, only for short flights.

The Secretary Bird has gained its chief repute in consequence of its Snake-eating habits, and all the older authors laid great stress on this excellent trait. Latterly, however, some observers have been inclined to minimise the good it does in this respect and to attribute to it great destruction of the young of partridges and hares. There is no doubt that its appetite is very varied and indiscriminating. In the stomach of a female shot on the Cape flats near Cape Town, there were found one tortoise (*Homopus*), eight chameleons, twelve lizards of two species, three frogs, one adder (*Bitis inornata*), two locusts, two quails, and remains of other animals. The prey is killed, or stunned, by a stamp from the powerful foot, and when a snake is attacked the wing is spread out as a shield to

defend the thighs and the body from the deadly bite, but is not used as a club as is stated by Levaillant. Mr. Atmore gives an instance of one being killed by the bite of a poisonous snake, the fang of which had drawn blood from the point of the pinion; but such instances must be rare. As in other accipitrine birds the bones, feathers, and other hard parts of the food are formed into pellets in the stomach and rejected.

The males are very pugnacious birds, especially at the breeding season which is early in July or August; each pair of birds keeps to a certain fixed area of ground and resents the intrusion of any other individuals within the same limits. The nest, which is a very bulky structure, is used year after year and is also resorted to at night as a roosting place; it is usually placed in a thick mimosa tree, or a bush on the high veld; but where trees are available, as in Natal, often in a high tree. Dr. Stark found two such nests in the upper districts of Natal, both in yellow-wood trees, one 60 feet, the other 120 feet above the ground.

The nest is built of sticks and sods and is lined with dry grass or wood and feathers, and measures as much as 5 feet in diameter and 3 feet in thickness. The eggs are bluish-white, sometimes plain, sometimes smeared with dirty brown; they are somewhat pointed ovals and measure on an average 3.05×2.25 . As a rule only two eggs are laid. After incubation which takes six weeks and is said to be undertaken by the female alone, the young remain in the nest for several months until they have got all their plumage. During this period their legs are very weak and brittle and they are only able to crawl about on the tarsus; even when fully grown this still remains the case and great care must be taken of individuals kept in captivity lest they break their legs when alarmed; both young and adult have a guttural rattling cry very difficult to describe in words.

In captivity the Secretary Bird does very well but is easily scared by strangers; it is often kept on farms in the Colony, as it is an excellent mediator in the poultry yard, keeping order among unruly cocks and hens, and freeing the place of snakes and rats. Sometimes, however, it develops a taste for young chickens which it is difficult to eradicate.

Mr. Sowerby, contrary to what one would expect, found the Secretary Bird very good eating.

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